

RL-TR-96-192, Volume II (of two)
Final Technical Report
September 1996



METAMODELING TECHNIQUES AND APPLICATIONS

Mission Research Corporation

Dr. Don Caughlin

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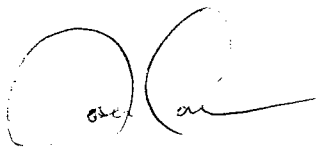
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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE September 1996	3. REPORT TYPE AND DATES COVERED Final May 94-Jan 96		
4. TITLE AND SUBTITLE METAMODELING TECHNIQUES AND APPLICATIONS			5. FUNDING NUMBERS C: F30602-94-C-0110 PE: 62702F PR: 4594 TA: 15 WU: KØ	
6. AUTHOR(S) Dr. Don Caughlin				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Mission Research Corporation 102 South Tejon, Suite 200 Colorado Springs, CO 80903-2200			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Rome Laboratory/IRAE 32 Hangar Road Rome, NY 13441-4114			10. SPONSORING/MONITORING AGENCY REPORT NUMBER RL-TR-96-192, Vol II (of two)	
11. SUPPLEMENTARY NOTES Rome Laboratory Project Engineer: Alex F. Sisti/IRAE/(315) 330-4518				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) Tactical simulation models used by the Department of Defense to assess the capabilities of combat systems and tactics are highly complex. It is often difficult to determine the relationship of individual factors to the performance of the modeled process. A technique called metamodeling has the ability to address this problem. This research developed the capability to build dynamic metamodels of tactical engagement simulations.				
14. SUBJECT TERMS Metamodeling Reduced Order Modeling Model Abstraction			15. NUMBER OF PAGES 206	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT Same as Report	

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CHAPTER 1

ANALYSIS OF TERSM MODEL 7

1. INTRODUCTION

In this experiment we look for sources of ill conditioning among regression variables in the TERSM least squares model from [1]. This metamodel was generated by a least squares fit of selected input data and provided an estimate of the number of emitters found with a CEP of 5 nautical miles (nm) or less. The inputs were aircraft altitude and velocity, azimuth coverage and channel capacity of the sensor. These inputs were combined to generate a nonlinear system with 22 inputs (up to the fourth order of a single input) to produce the square root of the number of emitters with a CEP of 5nm or less. Using a 2 layer central composite experimental design, the following model was obtained:

$$\begin{aligned}\sqrt{y} = & 23.567 - 0.669x_1 - 2.842x_2 + 1.298x_3 + 3.344x_4 \\ & - 0.491x_1x_3 + 0.963x_1x_4 + 0.414x_2x_3 + 1.155x_2x_4 \\ & + 0.231x_3x_4 + 0.404x_1x_2x_3 + 0.198x_1x_2x_4 + 0.201x_1x_3x_4 \\ & - 0.285x_2x_3x_4 + 2.037x_1^2 - 0.788x_3^2 - 2.743x_4^2 + 0.714x_1^3 \\ & + 5.836x_2^3 + 0.744x_3^3 - 2.947x_1^4 - 5.823x_2^4\end{aligned}$$

where:

- x_1 = Altitude
- x_2 = Velocity
- x_3 = Azimuth
- x_4 = Channel Capacity

The model provided an excellent fit with an R^2 of 98.9%, maximum absolute error of 73.51 emitters, and an average absolute relative error of 4.7%. This is a good example of a metamodel that can be used to explore the effect of the different input variables on the output via surface response methodology or capability based analysis.

The purpose of this analysis is to assess the extent that the least-squares estimate $\theta = (X^T X)^{-1} X^T y$ is potentially harmed by collinear relations. The harm from collinearity comes from the fact that a collinear relation can result in a situation where the observed influence of the explanatory variables is overcome by the model's random error term reducing the signal to noise. Collinearity is ill conditioning and is a data problem. Variates are collinear if the data vectors lie in a subspace of dimension less than the number of variates. This is equivalent to saying that there is a high correlation between the variates. Consequently, collinearity will be defined in terms of the conditioning of the data matrix X . This analysis is outlined in Volume I, Chapter 9, Section 3.3 and follows the development in [2].

1.1. Objectives of the Analysis

The analysis of the data set will attempt to answer the following questions:

1. How many near dependencies plague a given data set.
2. Which variates have coefficient estimates adversely affected by the presence of the dependencies.
3. Whether estimates of interest are included among those with inflated confidence intervals; and, therefore, corrective action is warranted.
4. Whether prediction intervals based on the estimated model are greatly inflated by the presence of ill conditioned data.
5. Whether specific coefficient estimates of interest are relatively isolated from the ill effects of collinearity; and, therefore, trustworthy in spite of ill conditioned data.

The analysis was accomplished via the aid of computer aided routines and some of the output is used in this chapter.

2. INPUT DATA ANALYSIS

If the data contain a constant term - the explanatory variable matrix X should contain uncentered data along with a column of ones. The use of centered data should be avoided since centering can mask the role of the constant in any underlying near dependencies and produce misleading diagnostic results.

Define μ_k , $k = 1, \dots, p$ as the singular values and v_{kj} as the variance of the matrix X . Compute the Singular Value Decomposition (SVD) of X :

- a. Calculate the condition indexes from $\eta_k = \frac{\mu_{\max}}{\mu_k}$, $k = 1, \dots, p$
- b. Calculate the Π matrix of variance-decomposition proportions from

$$\pi_{jk} \equiv \frac{\frac{v_{kj}^2}{\mu_j^2}}{\sum_{j=1}^p \frac{v_{kj}^2}{\mu_j^2}}$$

Figure 1.2.1 is a plot of the variance decomposition matrix.

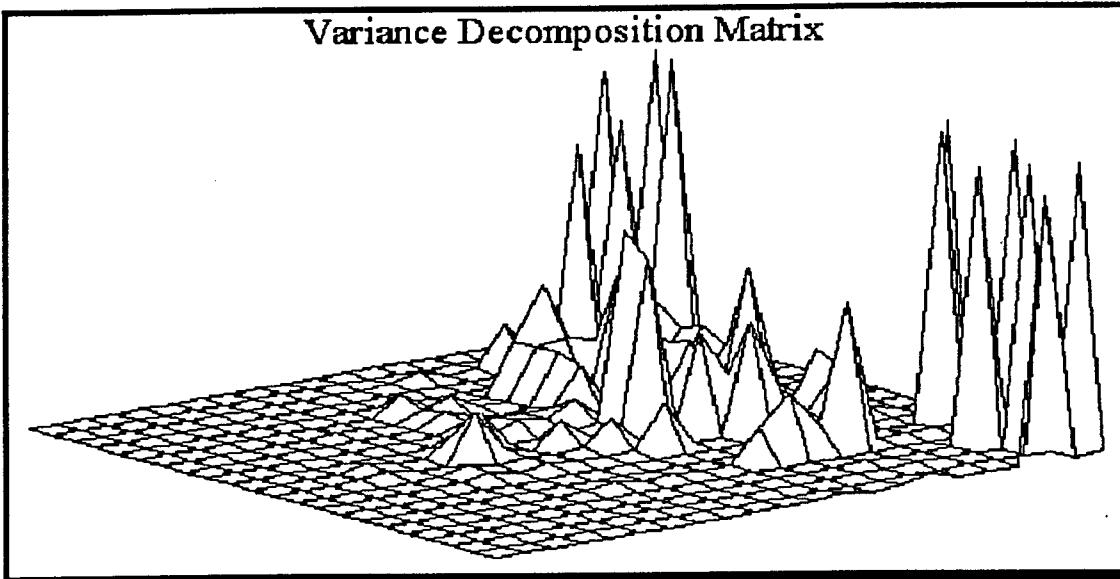


Figure 1.2.1. Variance Decomposition Matrix.

First, we determine the number and relative strengths of the near dependencies by the condition indices exceeding a given threshold. Examine the condition indices for the presence of competing dependencies - roughly equal condition indices. Then, we examine the condition indices for the presence of dominating dependencies - high condition indices coexisting with even larger indexes.

There are 16 indices exceeding a threshold of 10, they are:

1.0e+003x						
0.0106	0.0128	0.0142	0.0224	0.0257	0.0328	0.0391
0.0502	0.0667	0.0792	0.1192	0.1461	0.1559	0.1955
1.5048	1.9295					

There are 13 indices exceeding a threshold of 20

1.0e+003x						
0.0224	0.0257	0.0328	0.0391	0.0502	0.0667	0.0792
0.1192	0.1461	0.1559	0.1955	1.5048	1.9295	

There are 11 indices exceeding a threshold of 30

1.0e+003x						
0.0328	0.0391	0.0502	0.0667	0.0792	0.1192	0.1461
0.1559	0.1955	1.5048	1.9295			

The next step is to determine the number and relative strengths of the near dependencies by the condition indices exceeding a given threshold. The condition indices are:

1.0e+003x
 0.0010 0.0027 0.0032 0.0040 0.0062 0.0078 0.0106
 0.0128 0.0142 0.0224 0.0257 0.0328 0.0391 0.0502
 0.0667 0.0792 0.1192 0.1461 0.1559 0.1955 1.5048
 1.9295

Figure 1.2.2 is a plot of the condition indices, Table 1.2.1 summarizes the results of the analysis of the condition indices.

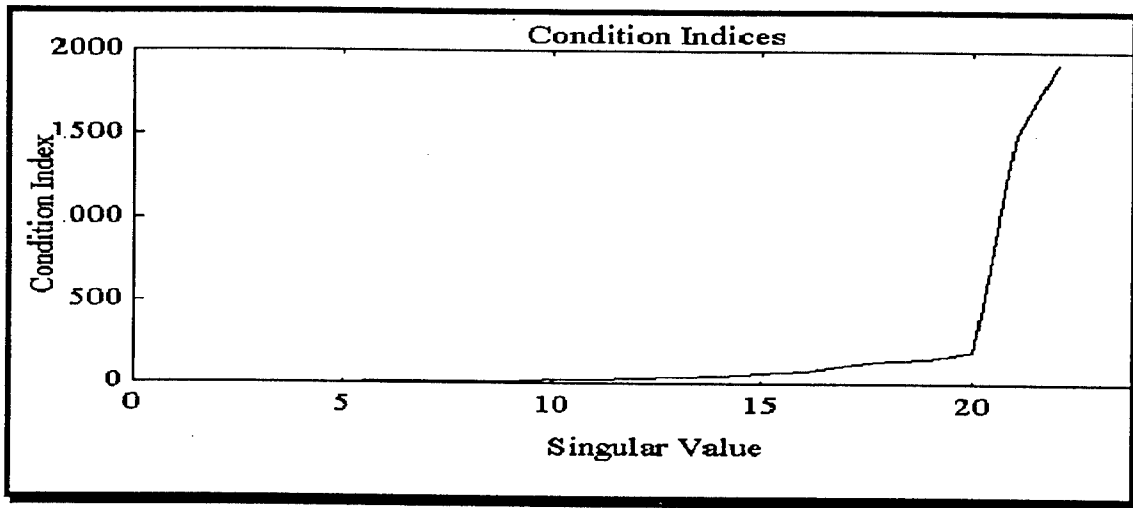


Figure 1.2.2. Condition Indices for the Singular Values.

Table 1.2.1. Results of the Analysis of the Condition Indices.

Competing Dependencies Between the Lower and Upper Condition Numbers	Lower Condition Number	Upper Condition Number
2	15	30
3	30	60
3	60	120
3	120	240
0	240	480
0	480	960
3	960	1920
3	1920	3840

The condition number 1929.46 is a dominating dependency. The variance proportion of condition number 1929.46 is shown in Figure 1.2.3. There is one variance proportion above 0.5. Auxiliary regressions are warranted with the dependent variable 20.

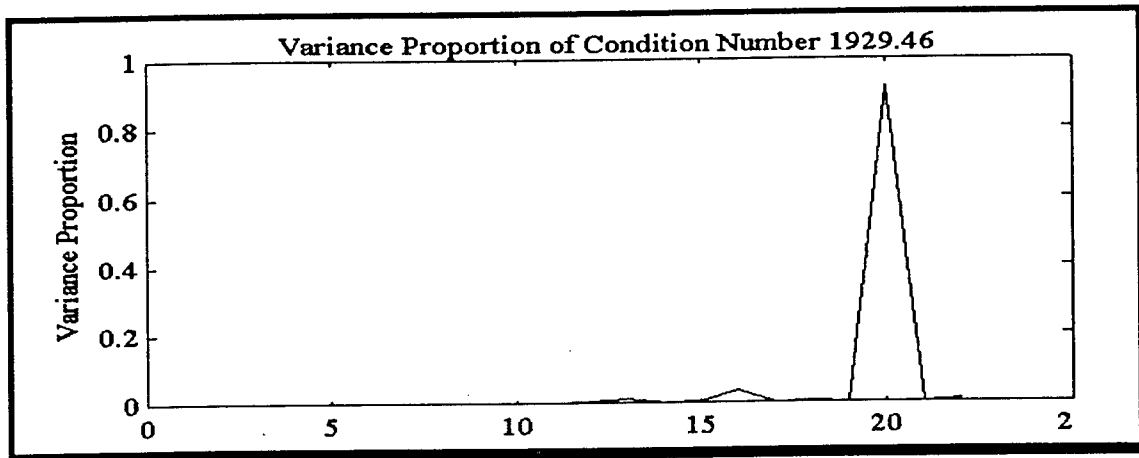


Figure 1.2.3. Variance Proportion of Condition Number 1929.46.

The condition number 1504.83 is a dominating dependency with one variance proportion above 0.5. Auxiliary regressions are warranted with dependent variable 22. The variance proportion of condition number 1504.83 is shown in Figure 1.2.4.

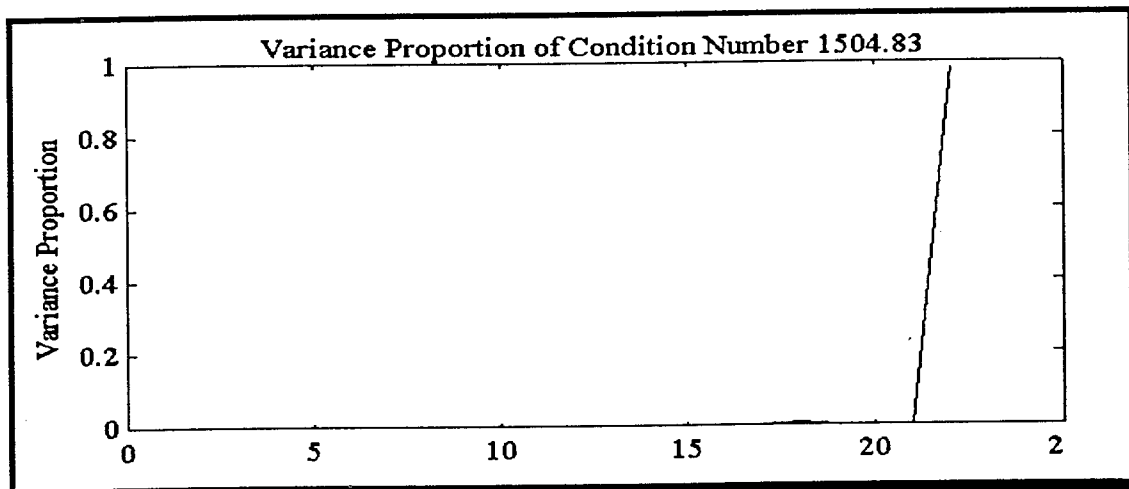


Figure 1.2.4. Variance Proportion of Condition Number 1504.83.

Condition numbers 146.069 through 195.468 are competing dependencies with three variance proportions above 0.5. Auxiliary regressions are warranted with the following dependent variables: 21, 20, 22. The variance proportion of condition numbers 146.069 through 195.468 are shown in Figure 1.2.5.

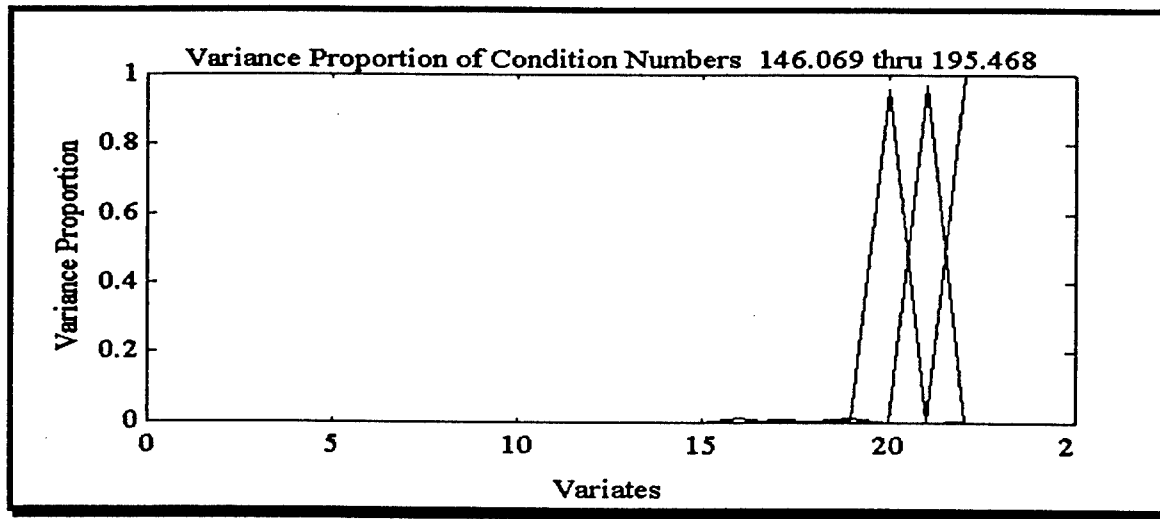


Figure 1.2.5. Variance Proportion of Condition Numbers 146.069 through 195.468.

Condition numbers 66.6565 through 119.17 are competing dependencies with two variance proportions above 0.5. Auxiliary regressions are warranted with dependent variables 21 and 22. The variance proportion of condition numbers 66.6565 through 119.17 are shown in Figure 1.2.6.

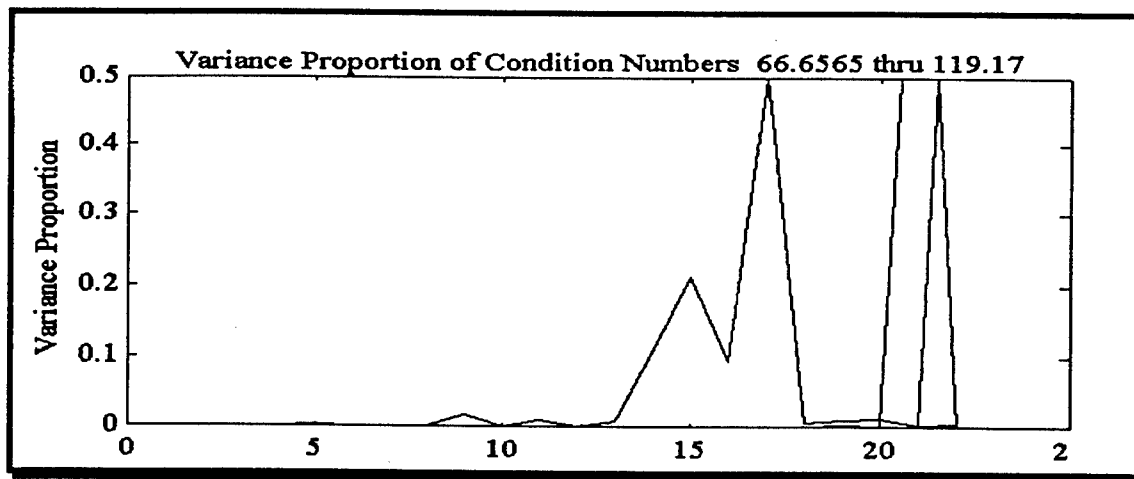


Figure 1.2.6. Variance Proportion of Condition Numbers 66.6565 through 119.17.

Condition numbers 32.8435 through 50.197 are competing dependencies with one variance proportion above 0.5. Auxiliary regressions are not required for these indices.

Condition numbers 22.3729 through 25.6774 are competing dependencies with one variance proportion above 0.5. Auxiliary regressions are not required for these indices.

Table 1.2.2 summarizes the results of the analysis of the pi matrix and depicts variates that have single dominant or a set of competing condition numbers. The first rows are from the higher condition numbers.

Table 1.2.2. Results of the Analysis of the pi Matrix.

20	0	0
22	0	0
21	20	22
21	22	0

The following is from auxiliary regressions using dependent variables 22, 21, and 20.

Dependent Variable # 20

R Squared = 1

Regression Coefficient	t Statistic	Probability of error in accepting H0 (no correlation)
------------------------	-------------	---

0.6727	12.5361	1.0000
0.0000	0.0000	0
0.0000	0.0000	0
-2.2659	20.2849	1.0000
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
2.5933	44.9084	1.0000
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0

Dependent Variable # 21

R Squared = 1

Regression Coefficient	t Statistic	Probability of error in accepting H0 (no correlation)
------------------------	-------------	---

-0.1142	2.5924	0.9854
0.9922	16.7952	1.0000
-0.0126	0.4903	0.3725
-0.0554	0.6038	0.4495
-0.0094	0.2556	0.2000
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
-2.4531	31.1990	1.0000
0.0301	0.6338	0.4690
0.0060	0.3413	0.2647
2.6102	71.0809	1.0000
0.0063	0.7251	0.5260

Dependent Variable # 22

R Squared = 1

Regression	t	Probability of error
Coefficient	Statistic	in accepting H0
		(no correlation)

0.1816	0.7940	0.5666
0.0304	0.0991	0.0783
-0.7744	5.8140	1.0000
0.1063	0.2232	0.1751
0.0382	0.2010	0.1579
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
0.0000	0.0000	0
-0.0194	0.0476	0.0376
-0.0577	0.2343	0.1837
-0.0244	0.2684	0.2098
0.0000	0.0000	0
1.5194	33.8189	1.0000

3. COMPLETE MODEL ANALYSIS

The input data analysis is complete and has identified a strong correlation in variates 20, 21, and 22. Now the model has to be reset so that centering and scaling can be accomplished on the original variables.

First, we compute the probability of error in accepting the hypothesis that the individual coefficient is zero.

Regression Coefficient	Standard Error	t Statistic	Probability of error in accepting H_0 that Parameter = 0
23.5916	0.1961	120.276	1.0000
-0.6688	0.4064	1.6457	0.8730
-2.8421	0.4064	6.9940	1.0000
1.2431	0.4040	3.0769	0.9952
3.2934	0.1331	24.7378	1.0000
0.4903	0.1554	3.1553	0.9961
0.9549	0.1549	6.1659	1.0000
0.4136	0.1554	2.6617	0.9871
1.1496	0.1549	7.4236	1.0000
0.2268	0.1546	1.4665	0.8405
0.4035	0.1591	2.5365	0.9827
0.1970	0.1589	1.2393	0.7729
0.2011	0.1589	1.2659	0.7822
-0.2844	0.1589	1.7897	0.9159
2.4893	1.2461	1.9977	0.9443
-0.7888	0.3874	2.0365	0.9486
-2.7123	0.3846	7.0515	1.0000
0.7139	0.4508	1.5836	0.8641
5.8357	0.4508	12.9449	1.0000
0.7986	0.4497	1.7758	0.9136
-3.4234	1.2180	2.8108	0.9909
-5.8418	0.3928	14.8716	1.0000

Predicted Values and Residuals for the fit of
the square root.

Obs	Actual	Estimate	Residual
1.0000	24.7992	25.4410	-0.6418
2.0000	13.8924	13.9641	-0.0716
3.0000	18.0831	18.4557	-0.3726
4.0000	7.2801	7.5530	-0.2729
5.0000	15.7162	15.6950	0.0213
6.0000	8.5440	8.4671	0.0769
7.0000	10.5357	10.8407	-0.3050
8.0000	6.8557	6.4619	0.3938
9.0000	20.8806	20.8571	0.0235
10.0000	15.0333	14.7921	0.2412
11.0000	17.9444	18.2516	-0.3072
12.0000	11.7473	11.1517	0.5956
13.0000	13.4164	13.5130	-0.0966
14.0000	10.7703	10.1213	0.6490
15.0000	9.8995	9.8104	0.0891
16.0000	8.1240	7.6586	0.4654
17.0000	23.7065	23.5916	0.1150
18.0000	20.9523	22.6123	-1.6600
19.0000	23.8747	22.7027	1.1720
20.0000	13.4536	14.7562	-1.3025
21.0000	21.5407	20.7435	0.7972
22.0000	20.4695	20.7610	-0.2916
23.0000	24.6374	24.8444	-0.2071
24.0000	15.4919	17.5859	-2.0939
25.0000	25.6515	24.1727	1.4788
26.0000	24.9199	25.1476	-0.2278
27.0000	20.5913	20.3127	0.2785
28.0000	22.6274	22.9967	-0.3693
29.0000	18.6279	18.3656	0.2623
30.0000	25.1794	25.6225	-0.4431
31.0000	22.1133	21.9752	0.1382
32.0000	23.8747	23.9440	-0.0693
33.0000	20.8327	20.8136	0.0191
34.0000	24.5357	24.6616	-0.1260
35.0000	21.0000	21.0719	-0.0719
36.0000	23.6643	23.3288	0.3355
37.0000	19.3132	19.7214	-0.4082
38.0000	25.5147	25.4488	0.0659
39.0000	22.9347	22.8345	0.1002
40.0000	24.5967	24.1759	0.4208
41.0000	21.7025	21.8571	-0.1546
42.0000	24.0832	24.2451	-0.1619
43.0000	24.1661	23.7548	0.4113
44.0000	23.9792	23.9180	0.0611
45.0000	23.0000	22.5349	0.4651
46.0000	22.6274	22.6435	-0.0161
47.0000	24.4336	24.1275	0.3061
48.0000	21.0000	21.0318	-0.0318
49.0000	25.2982	24.5785	0.7197

Mean Squared Error: 0.64151

Sum of Squares for the Residuals: 17.3209

R Squared Statistic: 0.99914

Adjusted R Squared Statistic: 0.99847

Results for the fit on the actual output

Actual Values and Residuals

Obs	Actual	Estimate	Residual
1.0000	615.0000	647.2462	-32.2462
2.0000	193.0000	194.9956	-1.9956
3.0000	327.0000	340.6138	-13.6138
4.0000	53.0000	57.0475	-4.0475
5.0000	247.0000	246.3319	0.6681
6.0000	73.0000	71.6918	1.3082
7.0000	111.0000	117.5205	-6.5205
8.0000	47.0000	41.7557	5.2443
9.0000	436.0000	435.0181	0.9819
10.0000	226.0000	218.8074	7.1926
11.0000	322.0000	333.1194	-11.1194
12.0000	138.0000	124.3615	13.6385
13.0000	180.0000	182.6021	-2.6021
14.0000	116.0000	102.4409	13.5591
15.0000	98.0000	96.2433	1.7567
16.0000	66.0000	58.6544	7.3456
17.0000	562.0000	556.5621	5.4379
18.0000	439.0000	511.3182	-72.3182
19.0000	570.0000	515.4112	54.5888
20.0000	181.0000	217.7440	-36.7440
21.0000	464.0000	430.2908	33.7092
22.0000	419.0000	431.0208	-12.0208
23.0000	607.0000	617.2463	-10.2463
24.0000	240.0000	309.2633	-69.2633
25.0000	658.0000	584.3200	73.6800

Obs	Actual	Estimate	Residual
26.0000	621.0000	632.4042	-11.4042
27.0000	424.0000	412.6072	11.3928
28.0000	512.0000	528.8469	-16.8469
29.0000	347.0000	337.2950	9.7050
30.0000	634.0000	656.5100	-22.5100
31.0000	489.0000	482.9079	6.0921
32.0000	570.0000	573.3143	-3.3143
33.0000	434.0000	433.2046	0.7954
34.0000	602.0000	608.1969	-6.1969
35.0000	441.0000	444.0229	-3.0229
36.0000	560.0000	544.2334	15.7666
37.0000	373.0000	388.9348	-15.9348
38.0000	651.0000	647.6396	3.3604
39.0000	526.0000	521.4125	4.5875
40.0000	605.0000	584.4764	20.5236
41.0000	471.0000	477.7325	-6.7325
42.0000	580.0000	587.8238	-7.8238
43.0000	584.0000	564.2907	19.7093
44.0000	575.0000	572.0718	2.9282
45.0000	529.0000	507.8214	21.1786
46.0000	512.0000	512.7291	-0.7291
47.0000	597.0000	582.1351	14.8649
48.0000	441.0000	442.3363	-1.3363
49.0000	640.0000	604.1050	35.8950

Maximum Absolute Error (Actual): 73.68
 Average Error: 0.35349
 Average Absolute Relative Error (Actual): 0.046558

Residual Analysis:

Maximum Absolute Error: 2.09395
Average Error: -9.29868e-015
Standard Deviation of the Error: 0.60071
Average Absolute Relative Error: 0.023114

Figure 1.2.7. is a plot of the Residual Power Spectrum.

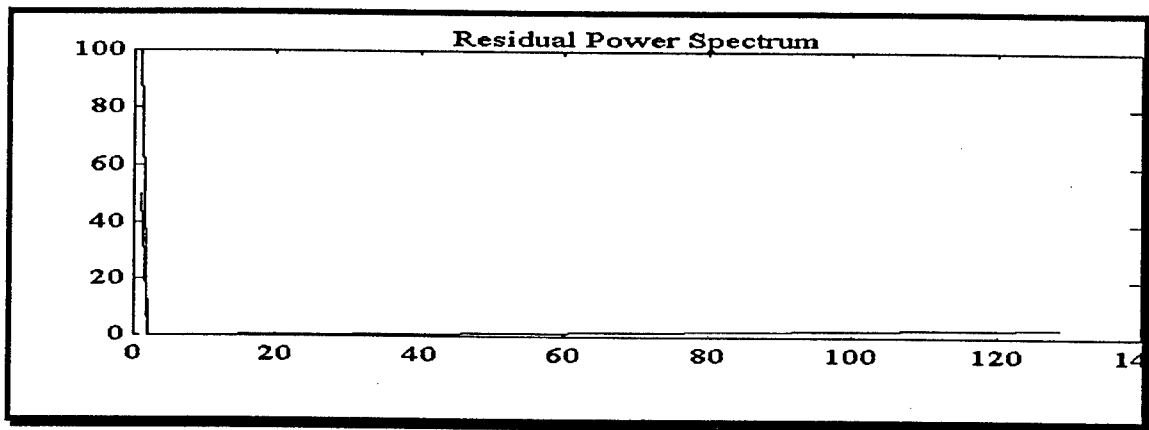


Figure 1.2.7. Residual Power Spectrum using the Full Data Set.

Figure 1.2.8. is a plot of the Residual Autocorrelation.

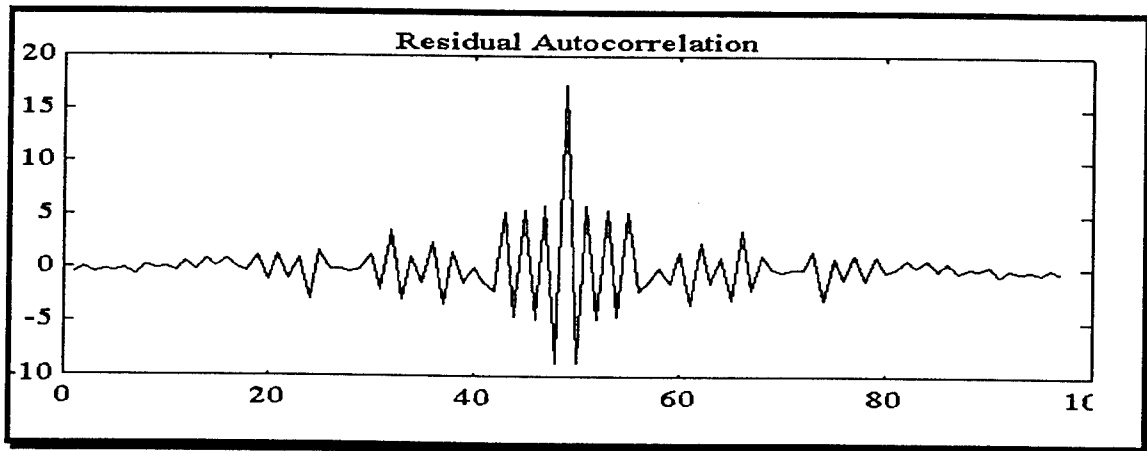


Figure 1.2.8. Residual Autocorrelation using the Full Data Set.

Figure 1.2.9. is a plot of the Residual Cumulative Probability Distribution.

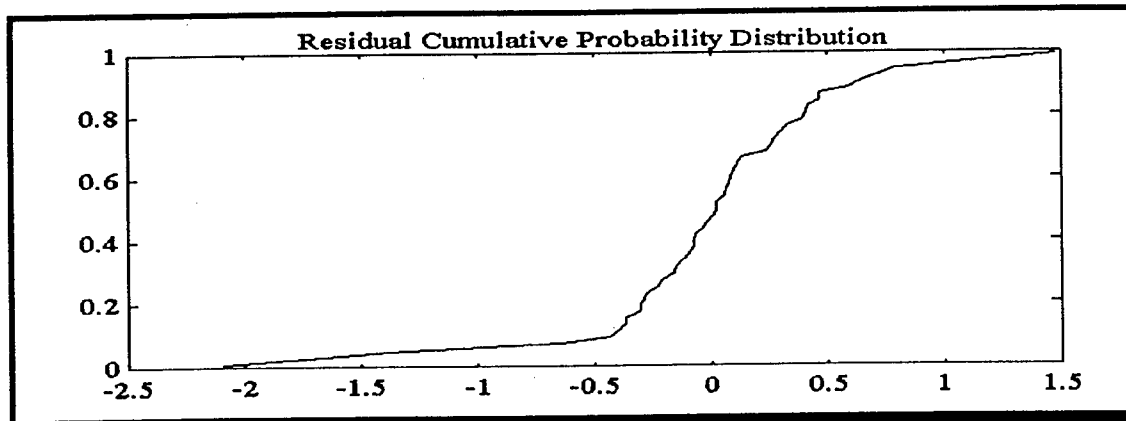


Figure 1.2.9. Residual Cumulative Probability Distribution using the Full Data Set.

4. MODEL ANALYSIS AFTER REMOVING VARIATES 20,21,22

Regression Standard t Probability of error
 Coefficient Error Statistic in accepting H0
 that Parameter = 0

24.4733	1.0764	22.7357	1.0000
-0.6688	3.0348	0.2204	0.1729
-2.8421	3.0348	0.9365	0.6434
1.9195	1.0055	1.9089	0.9345
3.2934	0.9943	3.3123	0.9976
0.4903	1.1605	0.4225	0.3243
0.9549	1.1566	0.8256	0.5844
0.4136	1.1605	0.3564	0.2760
1.1496	1.1566	0.9940	0.6717
0.2268	1.1548	0.1964	0.1544
0.4035	1.1881	0.3396	0.2635
0.1970	1.1871	0.1659	0.1307
0.2011	1.1866	0.1695	0.1335
-0.2844	1.1866	0.2396	0.1878
-3.0705	2.7294	1.1250	0.7300
-2.9832	2.7354	1.0906	0.7155
-4.6712	2.7416	1.7039	0.9022
0.7139	3.3669	0.2120	0.1665
5.8357	3.3669	1.7333	0.9075

Predicted Values and Residuals

Obs	Actual	Estimate	Residual
1.0000	24.7992	25.7525	-0.9533
2.0000	13.8924	14.2755	-0.3831
3.0000	18.0831	19.0116	-0.9284
4.0000	7.2801	8.1088	-0.8287
5.0000	15.7162	16.0064	-0.2902
6.0000	8.5440	8.7785	-0.2345
7.0000	10.5357	11.3965	-0.8609
8.0000	6.8557	7.0177	-0.1621
9.0000	20.8806	21.1685	-0.2879
10.0000	15.0333	15.1036	-0.0703
11.0000	17.9444	18.8074	-0.8631
12.0000	11.7473	11.7076	0.0397
13.0000	13.4164	13.8245	-0.4081
14.0000	10.7703	10.4328	0.3376
15.0000	9.8995	10.3662	-0.4667
16.0000	8.1240	8.2145	-0.0904
17.0000	23.7065	24.4733	-0.7667
18.0000	20.9523	21.3576	-0.4053
19.0000	23.8747	21.4479	2.4268
20.0000	13.4536	21.4796	-8.0260
21.0000	21.5407	27.4669	-5.9263
22.0000	20.4695	19.5705	0.8989
23.0000	24.6374	23.4095	1.2278
24.0000	15.4919	16.5086	-1.0167
25.0000	25.6515	23.0954	2.5561

Obs	Actual	Estimate	Residual
26.0000	24.9199	24.3163	0.6036
27.0000	20.5913	19.4814	1.1099
28.0000	22.6274	21.6871	0.9403
29.0000	18.6279	17.0561	1.5719
30.0000	25.1794	24.7911	0.3882
31.0000	22.1133	21.1438	0.9695
32.0000	23.8747	22.6345	1.2402
33.0000	20.8327	19.5040	1.3286
34.0000	24.5357	23.8303	0.7054
35.0000	21.0000	20.2405	0.7595
36.0000	23.6643	22.0193	1.6450
37.0000	19.3132	18.4119	0.9013
38.0000	25.5147	24.6174	0.8973
39.0000	22.9347	22.0031	0.9316
40.0000	24.5967	22.8664	1.7303
41.0000	21.7025	20.5476	1.1550
42.0000	24.0832	23.9508	0.1324
43.0000	24.1661	23.4605	0.7056
44.0000	23.9792	25.1648	-1.1857
45.0000	23.0000	23.7817	-0.7817
46.0000	22.6274	22.7129	-0.0855
47.0000	24.4336	24.6750	-0.2414
48.0000	21.0000	21.3455	-0.3455
49.0000	25.2982	24.8923	0.4060

Mean Squared Error: 4.79112

Sum of Squares for the Residuals: 143.734

R Squared Statistic: 0.99285

Adjusted R Squared Statistic: 0.98856

Results for the fit on the actual output

Actual Values and Residuals

Obs	Actual	Estimate	Residual
1.0000	615.0000	663.1901	-48.1901
2.0000	193.0000	203.7907	-10.7907
3.0000	327.0000	361.4402	-34.4402
4.0000	53.0000	65.7532	-12.7532
5.0000	247.0000	256.2051	-9.2051
6.0000	73.0000	77.0628	-4.0628
7.0000	111.0000	129.8812	-18.8812
8.0000	47.0000	49.2483	-2.2483
9.0000	436.0000	448.1067	-12.1067
10.0000	226.0000	228.1182	-2.1182
11.0000	322.0000	353.7188	-31.7188
12.0000	138.0000	137.0680	0.9320
13.0000	180.0000	191.1162	-11.1162
14.0000	116.0000	108.8423	7.1577
15.0000	98.0000	107.4586	-9.4586
16.0000	66.0000	67.4775	-1.4775
17.0000	562.0000	598.9407	-36.9407
18.0000	439.0000	456.1466	-17.1466
19.0000	570.0000	460.0129	109.9871
20.0000	181.0000	461.3738	-280.3738
21.0000	464.0000	754.4314	-290.4314
22.0000	419.0000	383.0061	35.9939
23.0000	607.0000	548.0062	58.9938
24.0000	240.0000	272.5346	-32.5346
25.0000	658.0000	533.3998	124.6002

Obs	Actual	Estimate	Residual
26.0000	621.0000	591.2832	29.7168
27.0000	424.0000	379.5251	44.4749
28.0000	512.0000	470.3321	41.6679
29.0000	347.0000	290.9094	56.0906
30.0000	634.0000	614.5996	19.4004
31.0000	489.0000	447.0618	41.9382
32.0000	570.0000	512.3185	57.6815
33.0000	434.0000	380.4075	53.5925
34.0000	602.0000	567.8840	34.1160
35.0000	441.0000	409.6786	31.3214
36.0000	560.0000	484.8488	75.1512
37.0000	373.0000	338.9981	34.0019
38.0000	651.0000	606.0180	44.9820
39.0000	526.0000	484.1376	41.8624
40.0000	605.0000	522.8731	82.1269
41.0000	471.0000	422.2024	48.7976
42.0000	580.0000	573.6395	6.3605
43.0000	584.0000	550.3950	33.6050
44.0000	575.0000	633.2686	-58.2686
45.0000	529.0000	565.5692	-36.5692
46.0000	512.0000	515.8743	-3.8743
47.0000	597.0000	608.8565	-11.8565
48.0000	441.0000	455.6307	-14.6307
49.0000	640.0000	619.6247	20.3753

Maximum Absolute Error (Actual):	290.431
Average Error:	2.93334
Average Absolute Relative Error (Actual):	0.12175

Residual Analysis

Maximum Absolute Error: 8.02599

Average Error: -1.31233e-014

Standard Deviation of the Error: 1.73045

Average Absolute Relative Error: 0.05674

Figure 1.2.10. is a plot of the Residual Power Spectrum excluding variates 20, 21,22.

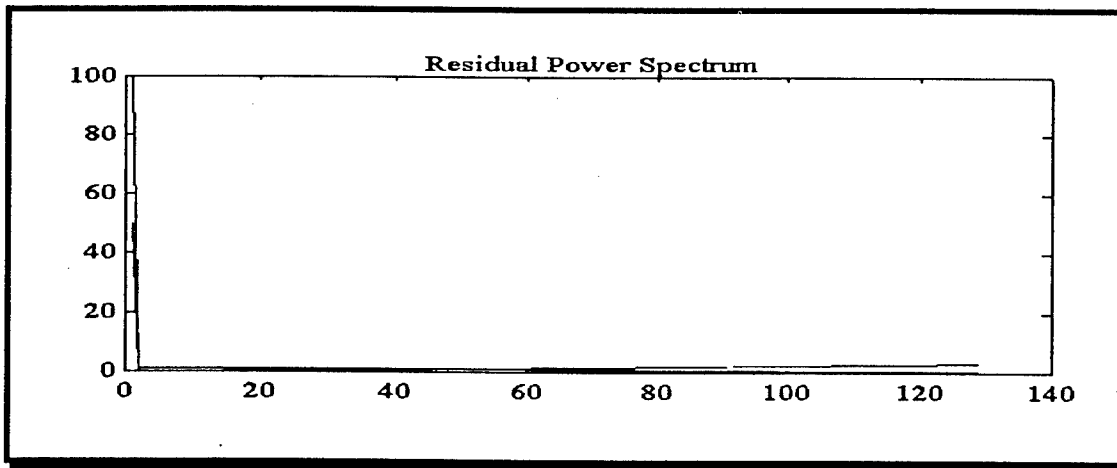


Figure 1.2.10. Residual Power Spectrum Excluding Variates 20, 21,22.

Figure 1.2.11. is a plot of the Residual Autocorrelation excluding variates 20, 21,22.

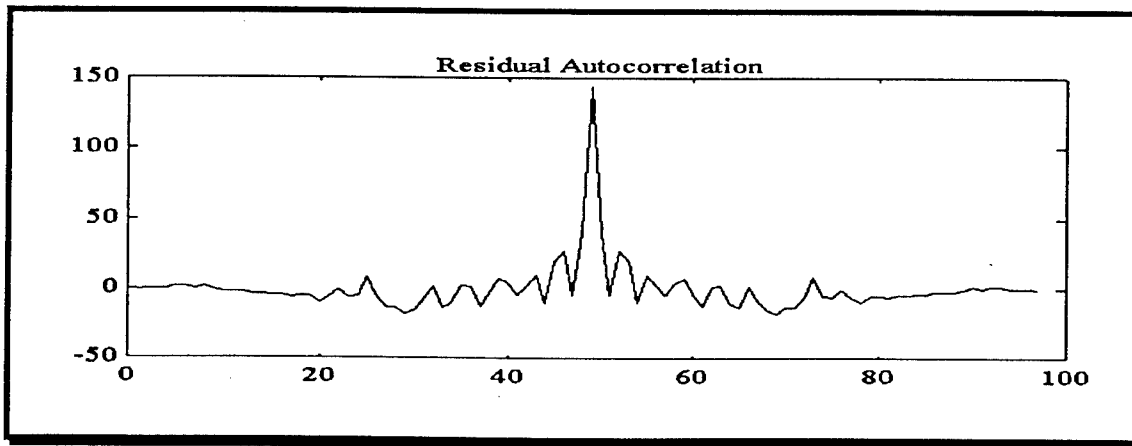


Figure 1.2.11. Residual Autocorrelation Excluding Variates 20, 21,22.

Figure 1.2.12. is a plot of the Residual Cumulative Probability Distribution excluding variates 20, 21,22.

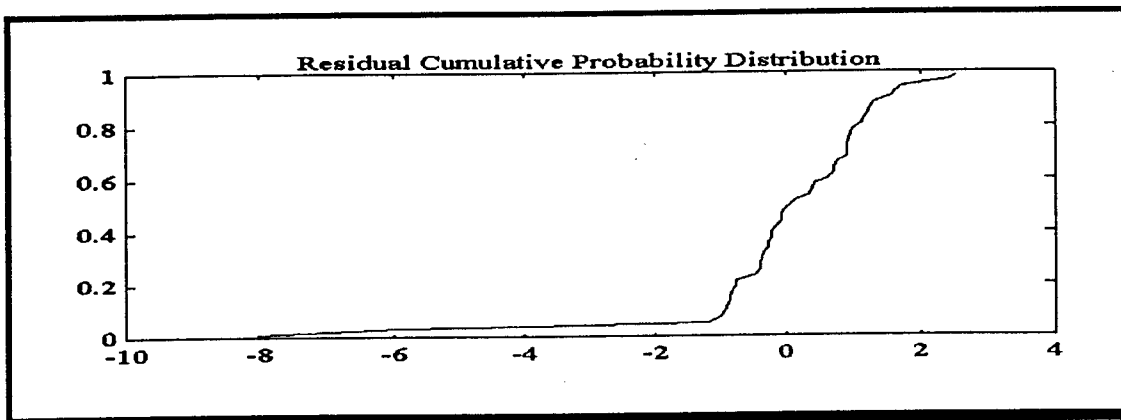


Figure 1.2.12. Residual Cumulative Probability Distribution Excluding Variates 20, 21,22.

5. MODEL ANALYSIS AFTER REMOVING VARIATE 22

Regression Standard t Probability of error
Coefficient Error Statistic in accepting H0
that Parameter = 0

23.2776	1.1762	19.7912	1.0000
-0.6688	2.4509	0.2729	0.2130
-2.8421	2.4509	1.1596	0.7433
1.2431	2.4367	0.5101	0.3860
3.2934	0.8030	4.1015	0.9997
0.4903	0.9372	0.5231	0.3950
0.9549	0.9341	1.0223	0.6844
0.4136	0.9372	0.4413	0.3376
1.1496	0.9341	1.2308	0.7702
0.2268	0.9326	0.2432	0.1903
0.4035	0.9595	0.4205	0.3227
0.1970	0.9587	0.2055	0.1613
0.2011	0.9583	0.2099	0.1647
-0.2844	0.9583	0.2967	0.2311
7.3559	7.2520	1.0143	0.6807
-2.4447	2.2377	1.0925	0.7157
-4.3231	2.2260	1.9421	0.9381
0.7139	2.7190	0.2626	0.2052
5.8357	2.7190	2.1462	0.9595
0.7986	2.7125	0.2944	0.2294
-10.2650	6.8019	1.5091	0.8503

Predicted Values and Residuals

Obs	Actual	Estimate	Residual
1.0000	24.7992	25.7272	-0.9280
2.0000	13.8924	14.2502	-0.3578
3.0000	18.0831	18.7418	-0.6587
4.0000	7.2801	7.8391	-0.5590
5.0000	15.7162	15.9811	-0.2648
6.0000	8.5440	8.7532	-0.2092
7.0000	10.5357	11.1268	-0.5912
8.0000	6.8557	6.7480	0.1077
9.0000	20.8806	21.1432	-0.2626
10.0000	15.0333	15.0783	-0.0450
11.0000	17.9444	18.5377	-0.5933
12.0000	11.7473	11.4379	0.3095
13.0000	13.4164	13.7992	-0.3827
14.0000	10.7703	10.4074	0.3629
15.0000	9.8995	10.0965	-0.1970
16.0000	8.1240	7.9447	0.1793
17.0000	23.7065	23.2776	0.4289
18.0000	20.9523	20.3234	0.6289
19.0000	23.8747	20.4137	3.4609
20.0000	13.4536	20.2840	-6.8304
21.0000	21.5407	26.2713	-4.7306
22.0000	20.4695	18.7912	1.6783
23.0000	24.6374	22.8746	1.7627
24.0000	15.4919	15.6611	-0.1692
25.0000	25.6515	22.2480	3.4036

Obs	Actual	Estimate	Residual
26.0000	24.9199	25.0883	-0.1684
27.0000	20.5913	20.2533	0.3379
28.0000	22.6274	22.9373	-0.3099
29.0000	18.6279	18.3062	0.3217
30.0000	25.1794	25.5631	-0.3837
31.0000	22.1133	21.9158	0.1976
32.0000	23.8747	23.8846	-0.0099
33.0000	20.8327	20.7542	0.0785
34.0000	24.5357	24.6023	-0.0666
35.0000	21.0000	21.0125	-0.0125
36.0000	23.6643	23.2694	0.3949
37.0000	19.3132	19.6620	-0.3488
38.0000	25.5147	25.3894	0.1253
39.0000	22.9347	22.7751	0.1596
40.0000	24.5967	24.1166	0.4802
41.0000	21.7025	21.7977	-0.0952
42.0000	24.0832	24.7202	-0.6370
43.0000	24.1661	24.2299	-0.0638
44.0000	23.9792	23.9692	0.0100
45.0000	23.0000	22.5861	0.4139
46.0000	22.6274	21.8970	0.7304
47.0000	24.4336	23.3810	1.0526
48.0000	21.0000	20.2508	0.7492
49.0000	25.2982	23.7976	1.5006

Mean Squared Error : 3.86925
 Sum of Squares for the Residuals: 108.339
 R Squared Statistic: 0.99461
 Adjusted R Squared Statistic: 0.99076

Results for the fit on the actual output

Actual Values and Residuals

Obs	Actual	Estimate	Residual
1.0000	615.0000	661.8863	-46.8863
2.0000	193.0000	203.0682	-10.0682
3.0000	327.0000	351.2567	-24.2567
4.0000	53.0000	61.4514	-8.4514
5.0000	247.0000	255.3950	-8.3950
6.0000	73.0000	76.6188	-3.6188
7.0000	111.0000	123.8058	-12.8058
8.0000	47.0000	45.5352	1.4648
9.0000	436.0000	447.0352	-11.0352
10.0000	226.0000	227.3538	-1.3538
11.0000	322.0000	343.6455	-21.6455
12.0000	138.0000	130.8248	7.1752
13.0000	180.0000	190.4166	-10.4166
14.0000	116.0000	108.3145	7.6855
15.0000	98.0000	101.9390	-3.9390
16.0000	66.0000	63.1188	2.8812
17.0000	562.0000	541.8484	20.1516
18.0000	439.0000	413.0407	25.9593
19.0000	570.0000	416.7202	153.2798
20.0000	181.0000	411.4401	-230.4401
21.0000	464.0000	690.1805	-226.1805
22.0000	419.0000	353.1102	65.8898
23.0000	607.0000	523.2486	83.7514
24.0000	240.0000	245.2710	-5.2710

Obs	Actual	Estimate	Residual
25.0000	658.0000	494.9717	163.0283
26.0000	621.0000	629.4207	-8.4207
27.0000	424.0000	410.1980	13.8020
28.0000	512.0000	526.1189	-14.1189
29.0000	347.0000	335.1171	11.8829
30.0000	634.0000	653.4701	-19.4701
31.0000	489.0000	480.3013	8.6987
32.0000	570.0000	570.4738	-0.4738
33.0000	434.0000	430.7359	3.2641
34.0000	602.0000	605.2712	-3.2712
35.0000	441.0000	441.5235	-0.5235
36.0000	560.0000	541.4660	18.5340
37.0000	373.0000	386.5958	-13.5958
38.0000	651.0000	644.6203	6.3797
39.0000	526.0000	518.7037	7.2963
40.0000	605.0000	581.6084	23.3916
41.0000	471.0000	475.1398	-4.1398
42.0000	580.0000	611.0880	-31.0880
43.0000	584.0000	587.0891	-3.0891
44.0000	575.0000	574.5226	0.4774
45.0000	529.0000	510.1306	18.8694
46.0000	512.0000	479.4794	32.5206
47.0000	597.0000	546.6698	50.3302
48.0000	441.0000	410.0957	30.9043
49.0000	640.0000	566.3245	73.6755

Maximum Absolute Error (Actual): 230.44

Average Error: 2.211

Average Absolute Relative Error (Actual): 0.0894

Residual Analysis

Maximum Absolute Error: 6.83036

Average Error: -8.91804e-015

Standard Deviation of the Error: 1.50235

Average Absolute Relative Error: 0.042049

Figure 1.2.13 is a plot of the Residual Power Spectrum with variate 22 removed.

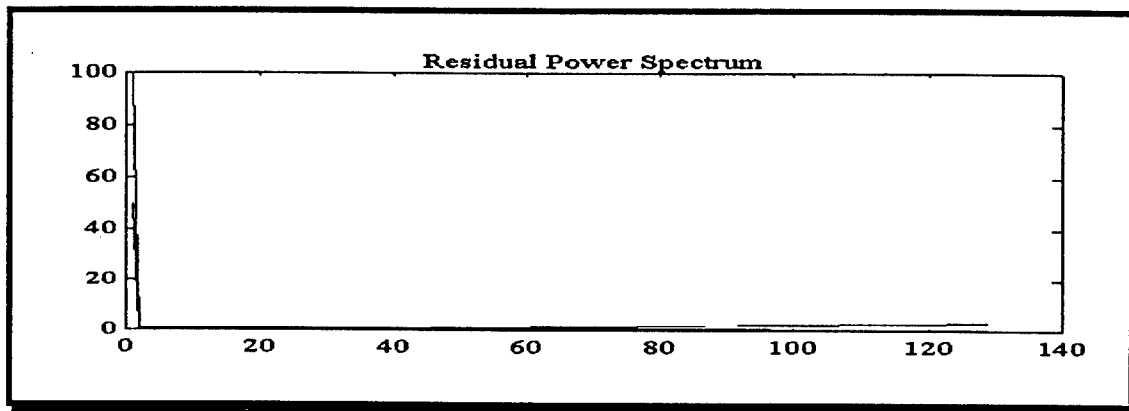


Figure 1.2.13. Residual Power Spectrum with Variate 22 Removed.

Figure 1.2.14 is a plot of the Residual Autocorrelation with variate 22 removed.

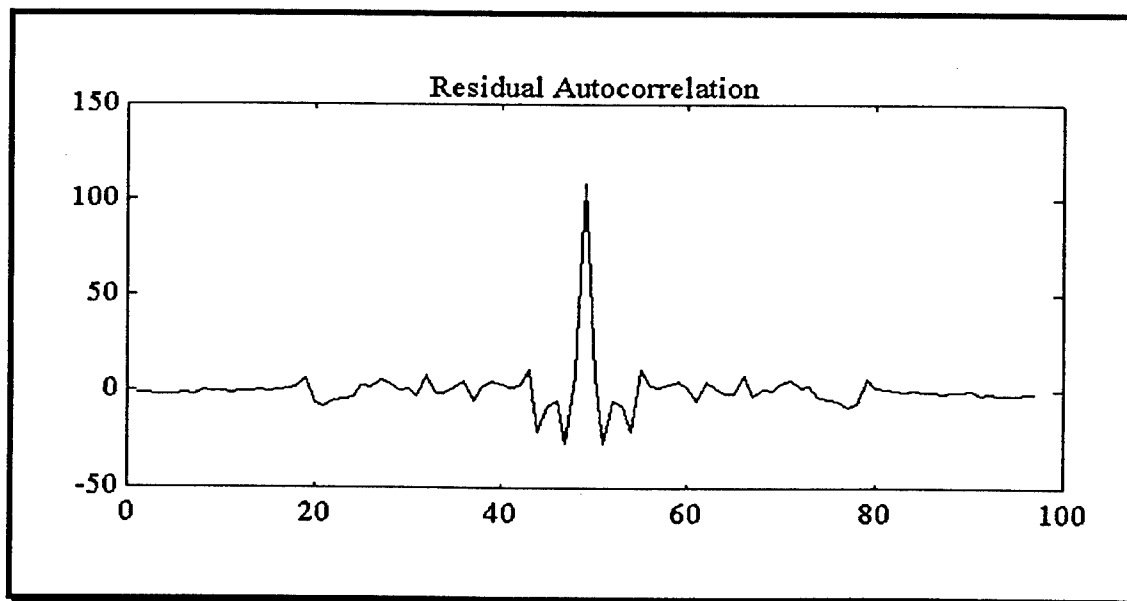


Figure 1.2.14. Residual Autocorrelation with Variate 22 Removed.

Figure 1.2.15 is a plot of the Residual Cumulative Probability Distribution with variate 22 removed.

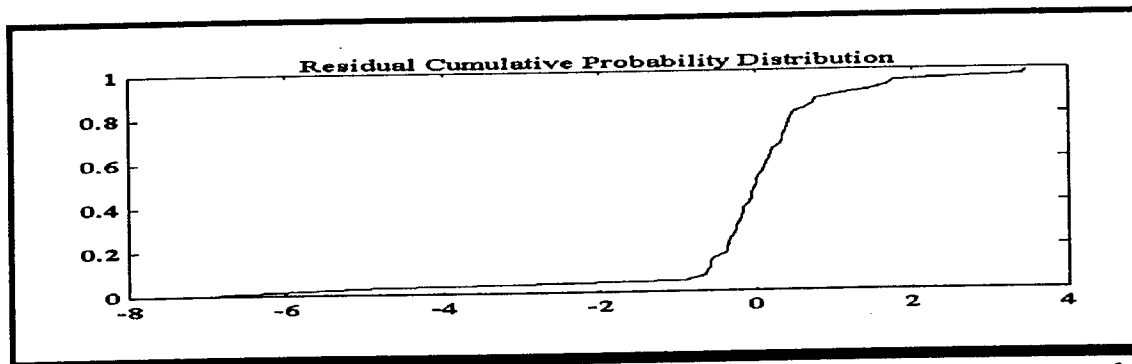


Figure 1.2.15. Residual Cumulative Probability Distribution with Variate 22 Removed.

6. MODEL ANALYSIS AFTER REMOVING VARIATE 21

Regression Standard t Probability of error
Coefficient Error Statistic in accepting H0
that Parameter = 0

23.9558	0.1686	142.0665	1.0000
-0.6688	0.4654	1.4370	0.8336
-2.8421	0.4654	6.1068	1.0000
1.2431	0.4627	2.6865	0.9880
3.2934	0.1525	21.5996	1.0000
0.4903	0.1780	2.7550	0.9898
0.9549	0.1774	5.3837	1.0000
0.4136	0.1780	2.3241	0.9725
1.1496	0.1774	6.4818	1.0000
0.2268	0.1771	1.2805	0.7875
0.4035	0.1822	2.2147	0.9650
0.1970	0.1820	1.0821	0.7112
0.2011	0.1820	1.1053	0.7212
-0.2844	0.1820	1.5627	0.8608
-0.8392	0.4441	1.8896	0.9312
-0.8246	0.4434	1.8597	0.9270
-2.6968	0.4405	6.1225	1.0000
0.7139	0.5163	1.3827	0.8191
5.8357	0.5163	11.3027	1.0000
0.7986	0.5151	1.5506	0.8586
-6.2588	0.4166	15.0250	1.0000

Predicted Values and Residuals

Obs	Actual	Estimate	Residual
1.0000	24.7992	25.4628	-0.6636
2.0000	13.8924	13.9858	-0.0934
3.0000	18.0831	18.4775	-0.3943
4.0000	7.2801	7.5747	-0.2946
5.0000	15.7162	15.7167	-0.0005
6.0000	8.5440	8.4889	0.0551
7.0000	10.5357	10.8624	-0.3268
8.0000	6.8557	6.4836	0.3720
9.0000	20.8806	20.8788	0.0018
10.0000	15.0333	14.8139	0.2194
11.0000	17.9444	18.2733	-0.3290
12.0000	11.7473	11.1735	0.5738
13.0000	13.4164	13.5348	-0.1184
14.0000	10.7703	10.1431	0.6273
15.0000	9.8995	9.8321	0.0674
16.0000	8.1240	7.6804	0.4437
17.0000	23.7065	23.9558	-0.2493
18.0000	20.9523	23.0714	-2.1191
19.0000	23.8747	23.1618	0.7129
20.0000	13.4536	14.7034	-1.2498
21.0000	21.5407	20.6907	0.8500
22.0000	20.4695	21.0895	-0.6201
23.0000	24.6374	25.1729	-0.5356
24.0000	15.4919	17.9656	-2.4737

Obs	Actual	Estimate	Residual
25.0000	25.6515	24.5524	1.0991
26.0000	24.9199	24.8628	0.0571
27.0000	20.5913	20.0279	0.5634
28.0000	22.6274	22.7118	-0.0844
29.0000	18.6279	18.0808	0.5472
30.0000	25.1794	25.3376	-0.1583
31.0000	22.1133	21.6903	0.4230
32.0000	23.8747	23.6591	0.2155
33.0000	20.8327	20.5287	0.3039
34.0000	24.5357	24.3768	0.1589
35.0000	21.0000	20.7870	0.2130
36.0000	23.6643	23.0440	0.6203
37.0000	19.3132	19.4366	-0.1234
38.0000	25.5147	25.1639	0.3508
39.0000	22.9347	22.5496	0.3851
40.0000	24.5967	23.8911	0.7056
41.0000	21.7025	21.5723	0.1303
42.0000	24.0832	23.9912	0.0920
43.0000	24.1661	23.5009	0.6652
44.0000	23.9792	24.2562	-0.2771
45.0000	23.0000	22.8731	0.1269
46.0000	22.6274	22.9984	-0.3710
47.0000	24.4336	24.4824	-0.0488
48.0000	21.0000	21.4005	-0.4005
49.0000	25.2982	24.9473	0.3509

Mean Squared Error:	0.73472
Sum of Squares for the Residuals:	20.5722
R Squared Statistic:	0.99898
Adjusted R Squared Statistic:	0.99825

Results for the fit on the actual output

Actual Values and Residuals

Obs	Actual	Estimate	Residual
1.0000	615.0000	648.3537	-33.3537
2.0000	193.0000	195.6037	-2.6037
3.0000	327.0000	341.4174	-14.4174
4.0000	53.0000	57.3766	-4.3766
5.0000	247.0000	247.0153	-0.0153
6.0000	73.0000	72.0607	0.9393
7.0000	111.0000	117.9927	-6.9927
8.0000	47.0000	42.0373	4.9627
9.0000	436.0000	435.9261	0.0739
10.0000	226.0000	219.4515	6.5485
11.0000	322.0000	333.9141	-11.9141
12.0000	138.0000	124.8472	13.1528
13.0000	180.0000	183.1906	-3.1906
14.0000	116.0000	102.8818	13.1182
15.0000	98.0000	96.6707	1.3293
16.0000	66.0000	58.9881	7.0119
17.0000	562.0000	573.8820	-11.8820
18.0000	439.0000	532.2917	-93.2917
19.0000	570.0000	536.4676	33.5324
20.0000	181.0000	216.1894	-35.1894
21.0000	464.0000	428.1043	35.8957
22.0000	419.0000	444.7690	-25.7690
23.0000	607.0000	633.6773	-26.6773
24.0000	240.0000	322.7630	-82.7630

Obs	Actual	Estimate	Residual
25.0000	658.0000	602.8220	55.1780
26.0000	621.0000	618.1593	2.8407
27.0000	424.0000	401.1166	22.8834
28.0000	512.0000	515.8273	-3.8273
29.0000	347.0000	326.9137	20.0863
30.0000	634.0000	641.9946	-7.9946
31.0000	489.0000	470.4703	18.5297
32.0000	570.0000	559.7551	10.2449
33.0000	434.0000	421.4287	12.5713
34.0000	602.0000	594.2289	7.7711
35.0000	441.0000	432.0999	8.9001
36.0000	560.0000	531.0247	28.9753
37.0000	373.0000	377.7811	-4.7811
38.0000	651.0000	633.2232	17.7768
39.0000	526.0000	508.4854	17.5146
40.0000	605.0000	570.7851	34.2149
41.0000	471.0000	465.3621	5.6379
42.0000	580.0000	575.5760	4.4240
43.0000	584.0000	552.2919	31.7081
44.0000	575.0000	588.3644	-13.3644
45.0000	529.0000	523.1785	5.8215
46.0000	512.0000	528.9286	-16.9286
47.0000	597.0000	599.3879	-2.3879
48.0000	441.0000	457.9832	-16.9832
49.0000	640.0000	622.3675	17.6325

Maximum Absolute Error (Actual): 93.2917

Average Error: 0.41984

Average Absolute Relative Error (Actual): 0.051711

Residual Analysis

Maximum Absolute Error: 2.47367
Average Error: -1.064e-014
Standard Deviation of the Error: 0.65467
Average Absolute Relative Error: 0.025557

Figure 1.2.16 is a plot of the Residual Power Spectrum with variate 21 removed.

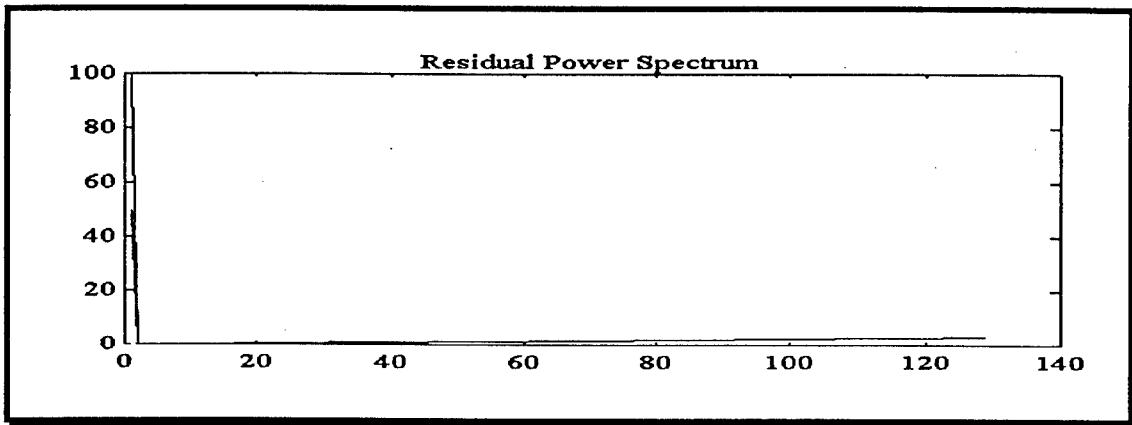


Figure 1.2.16. Residual Power Spectrum with Variate 21 Removed.

Figure 1.2.17 is a plot of the Residual Autocorrelation with variate 21 removed.

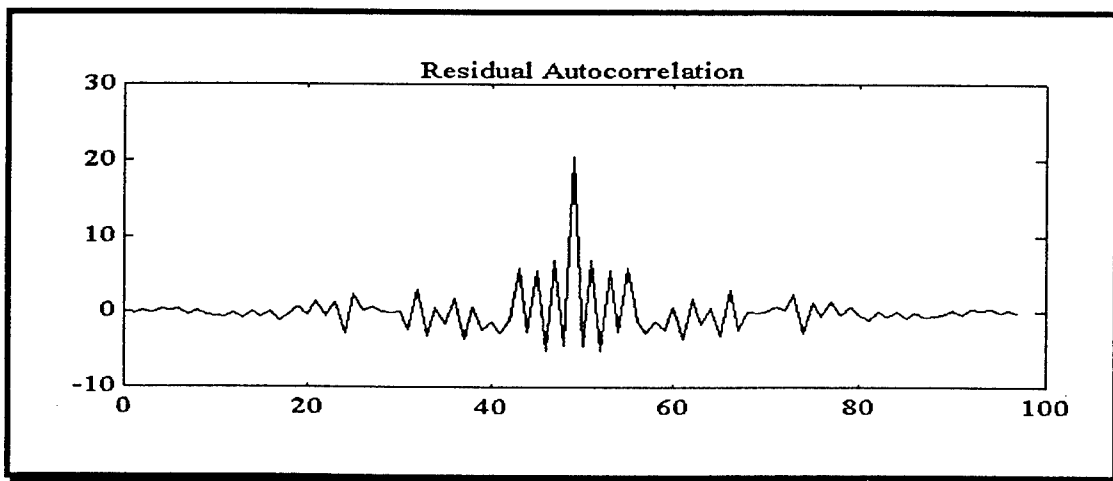


Figure 1.2.17. Residual Autocorrelation with Variate 21 Removed.

Figure 1.2.18 is a plot of the Residual Cumulative Probability Distribution with variate 21 removed.

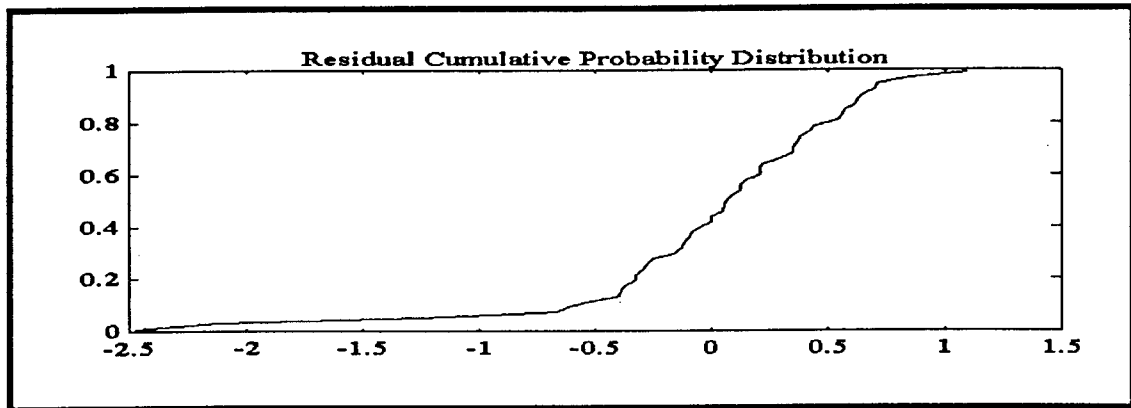


Figure 1.2.18. Residual Cumulative Probability Distribution with Variate 21 Removed.

7. MODEL ANALYSIS AFTER REMOVING VARIATE 20

Variates number 20 has been removed.

Regression Standard t Probability of error
Coefficient Error Statistic in accepting H0
that Parameter = 0

23.5916	0.2033	116.0363	1.0000
-0.6688	0.4212	1.5877	0.8650
-2.8421	0.4212	6.7475	1.0000
1.9195	0.1396	13.7540	1.0000
3.2934	0.1380	23.8658	1.0000
0.4903	0.1611	3.0441	0.9950
0.9549	0.1605	5.9486	1.0000
0.4136	0.1611	2.5679	0.9842
1.1496	0.1605	7.1619	1.0000
0.2268	0.1603	1.4149	0.8279
0.4035	0.1649	2.4471	0.9791
0.1970	0.1648	1.1956	0.7573
0.2011	0.1647	1.2213	0.7668
-0.2844	0.1647	1.7266	0.9056
2.4893	1.2916	1.9273	0.9362
-0.7888	0.4015	1.9647	0.9408
-2.7123	0.3987	6.8029	1.0000
0.7139	0.4673	1.5278	0.8542
5.8357	0.4673	12.4886	1.0000
-3.4234	1.2625	2.7117	0.9887
-5.8418	0.4072	14.3474	1.0000

Predicted Values and Residuals

Obs	Actual	Estimate	Residual
1.0000	24.7992	25.3188	-0.5196
2.0000	13.8924	13.8419	0.0506
3.0000	18.0831	18.5779	-0.4948
4.0000	7.2801	7.6752	-0.3951
5.0000	15.7162	15.5728	0.1435
6.0000	8.5440	8.3449	0.1991
7.0000	10.5357	10.9629	-0.4272
8.0000	6.8557	6.5841	0.2716
9.0000	20.8806	20.7349	0.1457
10.0000	15.0333	14.6699	0.3634
11.0000	17.9444	18.3738	-0.4294
12.0000	11.7473	11.2740	0.4734
13.0000	13.4164	13.3908	0.0256
14.0000	10.7703	9.9991	0.7712
15.0000	9.8995	9.9326	-0.0331
16.0000	8.1240	7.7808	0.3432
17.0000	23.7065	23.5916	0.1150
18.0000	20.9523	22.6123	-1.6600
19.0000	23.8747	22.7027	1.1720
20.0000	13.4536	14.7562	-1.3025
21.0000	21.5407	20.7435	0.7972
22.0000	20.4695	20.8832	-0.4138
23.0000	24.6374	24.7222	-0.0849
24.0000	15.4919	17.5859	-2.0939
25.0000	25.6515	24.1727	1.4788

Obs	Actual	Estimate	Residual
26.0000	24.9199	25.3867	-0.4669
27.0000	20.5913	20.5518	0.0394
28.0000	22.6274	22.7576	-0.1302
29.0000	18.6279	18.1265	0.5014
30.0000	25.1794	25.8615	-0.6822
31.0000	22.1133	22.2143	-0.1009
32.0000	23.8747	23.7049	0.1698
33.0000	20.8327	20.5745	0.2582
34.0000	24.5357	24.9007	-0.3651
35.0000	21.0000	21.3109	-0.3109
36.0000	23.6643	23.0897	0.5746
37.0000	19.3132	19.4823	-0.1691
38.0000	25.5147	25.6879	-0.1732
39.0000	22.9347	23.0736	-0.1389
40.0000	24.5967	23.9368	0.6599
41.0000	21.7025	21.6180	0.0845
42.0000	24.0832	24.2451	-0.1619
43.0000	24.1661	23.7548	0.4113
44.0000	23.9792	23.9180	0.0611
45.0000	23.0000	22.5349	0.4651
46.0000	22.6274	22.4044	0.2230
47.0000	24.4336	24.3666	0.0670
48.0000	21.0000	21.0318	-0.0318
49.0000	25.2982	24.5785	0.7197

Mean Squared Error: 0.66495

Sum of Squares for the Residuals: 18.6187

R Squared Statistic: 0.99907

Adjusted R Squared Statistic: 0.99841

Results for the fit on the actual output

Actual Values and Residuals

Obs	Actual	Estimate	Residual
1.0000	615.0000	641.0430	-26.0430
2.0000	193.0000	191.5976	1.4024
3.0000	327.0000	345.1396	-18.1396
4.0000	53.0000	58.9085	-5.9085
5.0000	247.0000	242.5108	4.4892
6.0000	73.0000	69.6373	3.3627
7.0000	111.0000	120.1850	-9.1850
8.0000	47.0000	43.3499	3.6501
9.0000	436.0000	429.9353	6.0647
10.0000	226.0000	215.2069	10.7931
11.0000	322.0000	337.5953	-15.5953
12.0000	138.0000	127.1020	10.8980
13.0000	180.0000	179.3143	0.6857
14.0000	116.0000	99.9821	16.0179
15.0000	98.0000	98.6560	-0.6560
16.0000	66.0000	60.5412	5.4588
17.0000	562.0000	556.5621	5.4379
18.0000	439.0000	511.3182	-72.3182
19.0000	570.0000	515.4112	54.5888
20.0000	181.0000	217.7440	-36.7440
21.0000	464.0000	430.2908	33.7092
22.0000	419.0000	436.1100	-17.1100
23.0000	607.0000	611.1890	-4.1890
24.0000	240.0000	309.2633	-69.2633
25.0000	658.0000	584.3200	73.6800
26.0000	621.0000	644.4869	-23.4869
27.0000	424.0000	422.3778	1.6222
28.0000	512.0000	517.9071	-5.9071
29.0000	347.0000	328.5698	18.4302
30.0000	634.0000	668.8197	-34.8197
31.0000	489.0000	493.4736	-4.4736
32.0000	570.0000	561.9216	8.0784
33.0000	434.0000	423.3088	10.6912
34.0000	602.0000	620.0472	-18.0472
35.0000	441.0000	454.1565	-13.1565
36.0000	560.0000	533.1348	26.8652
37.0000	373.0000	379.5612	-6.5612
38.0000	651.0000	659.8663	-8.8663
39.0000	526.0000	532.3890	-6.3890
40.0000	605.0000	572.9727	32.0273
41.0000	471.0000	467.3376	3.6624
42.0000	580.0000	587.8238	-7.8238
43.0000	584.0000	564.2907	19.7093
44.0000	575.0000	572.0718	2.9282
45.0000	529.0000	507.8214	21.1786
46.0000	512.0000	501.9582	10.0418
47.0000	597.0000	593.7300	3.2700
48.0000	441.0000	442.3363	-1.3363
49.0000	640.0000	604.1050	35.8950

Maximum Absolute Error (Actual): 73.68

Average Error: 0.37997

Average Absolute Relative Error (Actual): 0.050068

Residual Analysis

Maximum Absolute Error: 2.09395
Average Error: $-8.57364e-015$
Standard Deviation of the Error: 0.62281
Average Absolute Relative Error: 0.024829

Figure 1.2.19 is a plot of the Residual Power Spectrum, Figure 1.2.20 is a plot of the Residual Autocorrelation, and Figure 1.2.21 is a plot of the Residual Cumulative Probability Distribution. All plots have the effects of variate 20 removed.

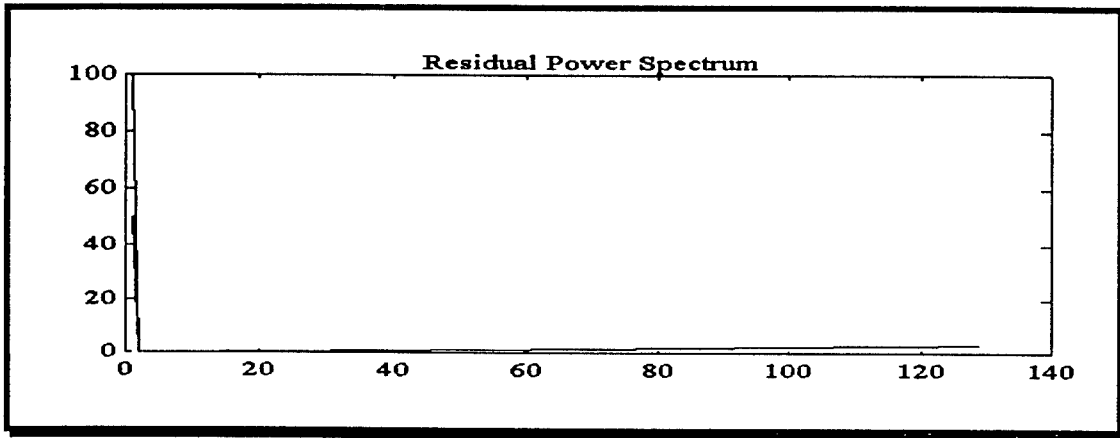


Figure 1.2.19. Residual Power Spectrum with Variate 20 Removed.

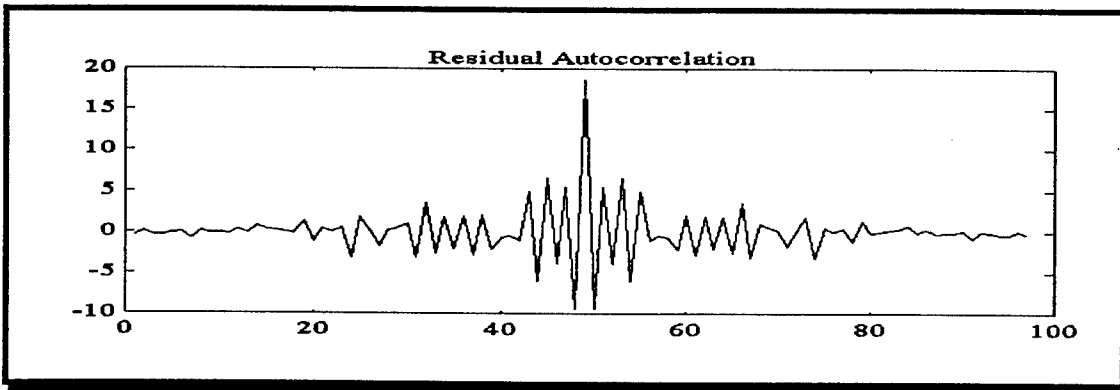


Figure 1.2.20. Residual Autocorrelation with Variate 20 Removed.

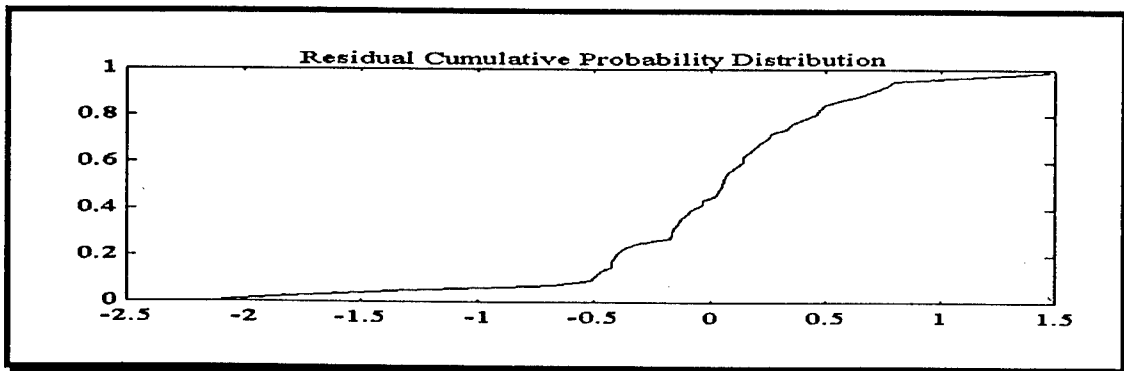


Figure 1.2.21. Residual Cumulative Probability Distribution with Variate 20 Removed.

8. REFERENCES

1. M. A. Zeimer, et al, "Metamodel Procedures for Air Engagement Simulation Models," *IRAE Technical Report*, January 1993.
2. D. Belsley, E. Kuh, R. Welsch, *Regression Diagnostics, Identifying Influential Data and Sources of Collinearity*, John Wiley & Sons, New York, 1980.

CHAPTER 2

ASA LEAST SQUARES METAMODEL

1. PREVIOUS WORK

Previous work with this simulation resulted in a metamodel that provided an estimate of the number of emitters found with a CEP of 5 nautical miles (nm) or less [1]. This metamodel was generated by a Least Squares fit of selected input data and the number of emitters reported with a CEP of 5 nm or less. The inputs were aircraft altitude and velocity, azimuth coverage and channel capacity of the sensor. These inputs were combined to generate a nonlinear system with 22 inputs (up to the fourth order of a single input) to produce the square root of the number of emitters with a CEP of 5nm or less. Using a 2 layer Central Composite Experimental Design, the following model was obtained:

$$\begin{aligned}\sqrt{y} = & 23.567 - 0.669x_1 - 2.842x_2 + 1.298x_3 + 3.344x_4 \\ & - 0.491x_1x_3 + 0.963x_1x_4 + 0.414x_2x_3 + 1.155x_2x_4 \\ & + 0.231x_3x_4 + 0.404x_1x_2x_3 + 0.198x_1x_2x_4 + 0.201x_1x_3x_4 \\ & - 0.285x_2x_3x_4 + 2.037x_1^2 - 0.788x_3^2 - 2.743x_4^2 + 0.714x_1^3 \\ & + 5.836x_2^3 + 0.744x_3^3 - 2.947x_1^4 - 5.823x_2^4\end{aligned}$$

where

$x_1 = \textit{Altitude}$

$x_2 = \textit{Velocity}$

$x_3 = \textit{Azimuth}$

$x_4 = \textit{Channel Capacity}$

The model provided an excellent fit with an R^2 of 98.9%, Maximum Absolute Error of 73.51 emitters, and an Average Absolute Relative Error of 4.7%. This is a good example of a Metamodel that can be used to explore the effect of the different input variables on the output via Surface Response Methodology or Capability Based Analysis. It has not, however, identified the system simulated by TERSM. As such, its utility for simplifying or coupling simulations, further analysis, or updating knowledge bases in expert systems is limited. Also, the domain of validity (range of the response) is not guaranteed outside of the area of the fit.

ASA was used to verify that the noise statistics of the simulation output were close enough to the assumptions of the Least Squares technique to allow a global minimum.

2. ASA METAMODEL

The ASA code was ported to an SGI Crimson, and the user input code was modified to load the input data shown in Table 2.2.1.

Table 2.2.1. Input-Output Data for Construction of the Static Least Squares Metamodel.

ALTITUDE (x_1)	VELOCITY (x_2)	AZIMUTH COVERAGE (x_3)	CHANNEL CAPACITY (x_4)	EMITTERS FOUND < 5NM (y)
40000	1150	150	30	615
40000	1150	150	4	193
40000	1150	60	30	327
40000	1150	60	4	53
40000	186	150	30	247
40000	186	150	4	73
40000	186	60	30	111
40000	186	60	4	47
5000	1150	150	30	436
5000	1150	150	4	225
5000	1150	60	30	322
5000	1150	60	4	138
5000	186	150	30	180
5000	186	150	4	116
5000	186	60	30	98
5000	186	60	4	66
22500	668	105	17	562
5000	668	105	17	439
40000	668	105	17	570
22500	186	105	17	181
22500	1150	105	17	464
22500	668	60	17	419
22500	668	150	17	607
22500	668	105	4	240
22500	668	105	30	658
31250	909	128	24	621
31250	909	128	10	424
31250	909	82	24	512
31250	909	82	10	347
31250	427	128	24	634
31250	427	128	10	489
31250	427	82	24	570
31250	427	82	10	434
13750	909	128	24	602
13750	909	128	10	441
13750	909	82	24	560
13750	909	82	10	373
13750	427	128	24	651
13750	427	128	10	526
13750	427	82	24	605
13750	427	82	10	471
13750	668	105	17	580
31250	668	105	17	584
22500	427	105	17	575
22500	909	105	17	529
22500	668	82	17	512
22500	668	128	17	597
22500	668	105	10	441
22500	668	105	24	640

the cost function was modified as shown in Figure 2.2.1 to perform a minimum mean square error fit of the TERSM data.

```
/* Least squares fit of the TERSM Data using parameters from model #7
 * The data input (combinations of inx) for the parameters are in B
 * The parameters to be determined are in xi*/

double err, YI;
LONG_INT i, j;

err = 0 ;
for (i = 0; i < DATA_LIMIT; ++i)
    {
    YI = 0 ;
    for (j = 0; j < ARRAY_LIMIT; ++j)
        {
        YI = YI + (x[j] * B[i][j]) ;
        }
    err = err + (sqrt(Y[i]) - YI)*(sqrt(Y[i]) - YI) ;
    }
err = err / DATA_LIMIT ;
return (err);
```

Figure 2.2.1. Cost Function for the Static Least Squares Metamodel.

The initial run used the default initial temperature, initial parameter values of zero, and parameter boundaries of ± 50 . ASA ran for 3 days (almost exclusively) and generated 62MB of intermediate output data. The program was terminated by the user. It had not found a minimum, but also had not encountered one of the error conditions (parameter temperature too small, repeating cost, etc.) that would cause the search to terminate. The parameter coefficients from this run (with the Least Squares results in parentheses) resulted in a Maximum Absolute Error of 369.88 (73.9) emitters, an Average Error of -3.7 (2.82) emitters, and an Average Absolute Relative Error of 4.7% (4.85%). No improvement.

Successive refinements in the initial conditions resulted in significant improvements in the run time and performance of the optimization. The final run initialized the parameters at the Least Squares values, and established the boundary conditions of the search at the parameter covariance provided by Least Squares.

ASA terminated with a "cost repeating" error after 11 reannealing attempts and a 3 minute, 53 second run time.

ASA did find a lower cost fit than the Least Squares technique. The improvement provided by ASA was in line with expectations considering the quality of the Least Squares model. The Maximum Absolute Error was reduced by 1.4%, the Average Error was reduced by 91.8% (to .2234), and the Average Absolute Relative Error was reduced by 3.5%.

3. RESULTS AND CONCLUSIONS

Initialized properly, ASA provided advertised results at a reasonable cost. The ASA code (written in C) is very portable although quite complex to accommodate different environments. In summary, this research demonstrated that ASA:

1. Provides a global minima in parameter space that are more certain than with regression fitting
2. Can handle very nonlinear functions and higher order models
3. Easily incorporated initial and boundary conditions
4. Can be used to verify linearization assumptions.

4. REFERENCES

1. M. A. Zeimer, et al, "Metamodel Procedures for Air Engagement Simulation Models," *IRAE Technical Report*, January 1993.

CHAPTER 3

TERSM OUTPUT-ERROR METAMODEL

1. TERSM OVERVIEW

1.1. System Representation

Following the work described in Chapter 2, we applied system identification to the TERSM metamodeling problem. TERSM (Tactical Electronic Reconnaissance Simulation Model) was designed to provide comparative performance evaluations of single and multiple-pass DF (direction-finding) systems. The output of the simulation is the number of bearing measurements made on each emitter, and the lower bound on the resulting circular error probable (CEP) of emitter locations. Inputs to the simulation include sensor parameters, an emitter environment, and aircraft parameters. The program functions as shown in Figure 3.1.1.

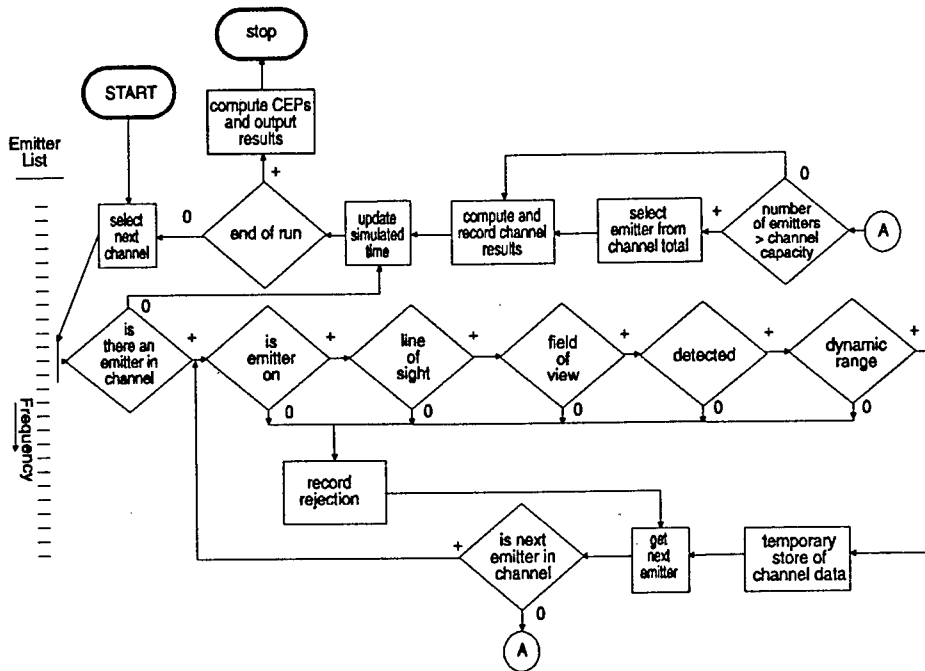


Figure 3.1.1. TERSM Functional Flow.

From this overview, you can see that the simulation is centered on the DF sensor and the operations that have to take place within the system. As a result, data generated by the simulation is event driven as a function of DF sensor processing. The update of the simulation time and corresponding motion of the aircraft platform is a function of the time required to process the data. This in turn, is a function of the number channels operating, the number of emitters detected in the channel, the frequency-scanning technique (continuous serial scanning, parallel scanning, and either serial or parallel priority scanning), and the channel capacities.

The simulation produces a lower bound on emitter location accuracy based on the assumption that the bearing errors from measurement to measurement on the same emitter are normally distributed. During the simulation, the information matrix of the probability density function is computed from the following sums:

$$I_{11} = \sum \frac{(y_i - y_e)^2}{r_i^4 \sigma}$$

$$I_{12} = \sum \frac{(x_i - x_e)(y_i - y_e)}{r_i^4 \sigma}$$

$$I_{22} = \sum \frac{(x_i - x_e)^2}{r_i^4 \sigma}$$

where σ is the standard deviation of the bearing measurement, x_i and y_i are the aircraft coordinates, x_e and y_e are the emitter coordinates, and r_i is the range at each DF measurement. At termination of the run, the covariance of the emitter location is obtained by inverting the information matrix. The covariance matrix is then diagonalized to obtain variances along the major (σ_L) and minor (σ_s) axes of the location uncertainty ellipse. The Cramer-Rao lower bound for the CEP is then computed from:

$$CEP = .674 + 0.8 \left(\frac{\sigma_s}{\sigma_L} \right)^2 \quad \text{for } \frac{\sigma_s}{\sigma_L} \leq 0.5$$

or

$$CEP = .587(\sigma_s + \sigma_L) \quad \text{for } \frac{\sigma_s}{\sigma_L} > 0.5$$

1.2. Emitter Field

The emitter field for this experiment consisted of 2359 emitters with as shown in Figure 3.1.2.. Also shown are the aircraft flight path (solid line) and the sensor field of view.

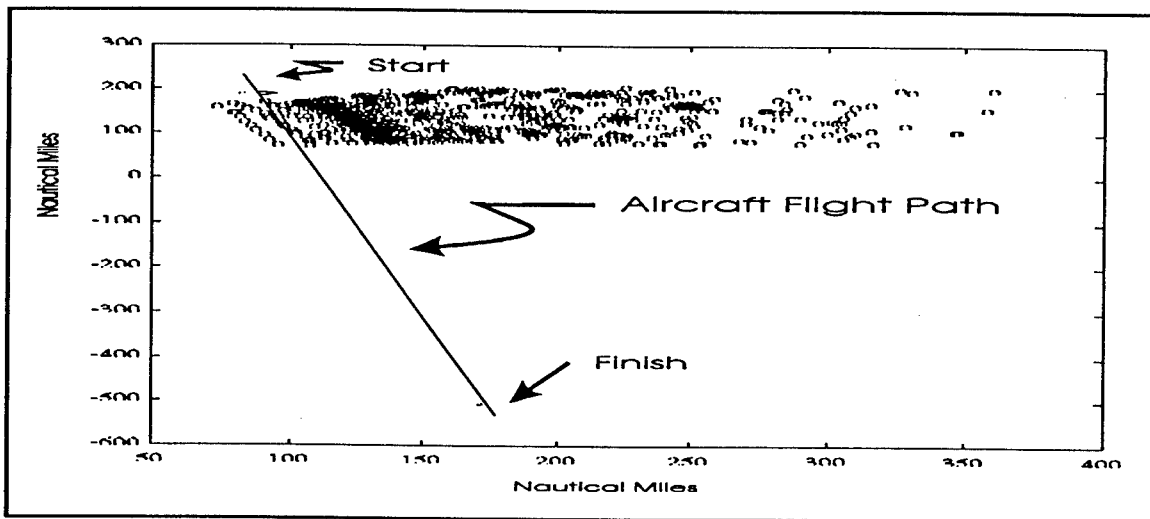


Figure 3.1.2. TERSM Emitter Field and Aircraft Path.

2. PREVIOUS WORK

Previous work with this simulation resulted in a metamodel that provided an estimate of the number of emitters found with a CEP of 5 nautical miles (nm) or less [1]. This metamodel was generated by a least squares fit of selected input data and the number of emitters reported with a CEP of 5nm or less. The inputs were aircraft altitude and velocity, azimuth coverage and channel capacity of the sensor. These inputs were combined to generate a nonlinear system with 22 inputs (up to the fourth order of a single input) to produce the square root of the number of emitters with a CEP of 5nm or less. Using a 2 layer central composite experimental design, the following model was obtained:

$$\begin{aligned}\sqrt{y} = & 23.567 - 0.669x_1 - 2.842x_2 + 1.298x_3 + 3.344x_4 \\ & - 0.491x_1x_3 + 0.963x_1x_4 + 0.414x_2x_3 + 1.155x_2x_4 \\ & + 0.231x_3x_4 + 0.404x_1x_2x_3 + 0.198x_1x_2x_4 + 0.201x_1x_3x_4 \\ & - 0.285x_2x_3x_4 + 2.037x_1^2 - 0.788x_3^2 - 2.743x_4^2 + 0.714x_1^3 \\ & + 5.836x_2^3 + 0.744x_3^3 - 2.947x_1^4 - 5.823x_2^4\end{aligned}$$

where

x_1 = Altitude

x_2 = Velocity

x_3 = Azimuth

x_4 = Channel Capacity

The model provided an excellent fit with an R^2 of 98.9%, maximum absolute error of 73.51 emitters, and an average absolute relative error of 4.7%. This is a good example of a metamodel that can be used to explore the effect of the different input variables on the output via surface response methodology or capability based analysis. It has not, however, identified the system simulated by TERSM. As such, its utility for simplifying or coupling simulations, further analysis, or updating knowledge bases in expert systems is limited. Also, the domain of validity (range of the response) is not guaranteed outside of the area of the fit.

3. AN OUTPUT-ERROR METAMODEL FOR TERSM

We will pursue a different approach. Rather than combine inputs to fit the output, we will use our knowledge of the system to identify what is essentially a reduced order model. This model will concentrate on identification of the latent variables inherent to the system. Consequently, the validity of the model will not be restricted to the data used to build it.

We assume that the desired result remains the number of emitters with a CEP of less than 5nm.

Therefore we will concentrate on a metamodel that will actually compute the CEP (as opposed to other measures that may be of interest such as the probability of detection, the probability of location within 5nm, etc.).

To use this metamodel for the kind of analysis discussed above, however, we need to relate the input variables of altitude, airspeed, azimuth, and channel capacity to the latent variables used for this identification. This would require running the simulation to capture the data or another mapping from the input variables to the latent variable inputs to this metamodel.

TERSM was run simulating a single aircraft flying for 1476 seconds at 40,000 feet, 560 knots, with a sensor that could view on both the left and right. The sensor used a parallel scan over 5 bands, scanning from 60Mhz to 18GHz, with a channel capacity of 20 emitters, a 90 degree viewing angle, and a 40 degree depression. Data from this simulated flight was collected by slightly modifying (to add a few parameters) existing write statements that already existed in the simulation.

From the discussion on TERSM and analysis of the code, we see that the CEPs are functions of the relative difference between the aircraft and emitter position, and the standard deviation of the bearing noise. These parameters are used to calculate the four terms that make up the information matrix. In TERSM a running total of the information matrix is maintained for each emitter, and the lower bound of the CEP is calculated at the end of the run.

In the simulation, 949 of the 2,359 emitters were detected by the sensor. There were 12,981 DF measurements. Of these, the sequence of calculations in two cases caused the lower bound for the CEP to exceed the capability of the computer and were thus undefined. Three of the individual measurements resulted in estimates of the CEPs in excess of 5,000nm. These outliers were removed from the data resulting in 12,976 data points. (Note that in TERSM, these calculations did not pose a problem. Since, the information matrix was not inverted until the end of the run, the numerical effect of these single measurements were not observable.) In the 12,976 data points, the average lower bound for the CEP for the first half of that data points was 140nm, the average lower bound for the second half of the data was 32nm resulting in an overall average of 86nm. The maximum CEP in the data was 4,998nm, and the minimum was 1.2nm. Of the 949 emitters that were detected, 329 were located with a lower bound on the CEP of less than 5nm.

At this point, two metamodels were considered. First, a dynamical model of the simulation could have been developed that incorporated both current and past inputs and outputs in a state-space or Box-Jenkins model structure:

$$y(t) = \frac{B(q)}{F(q)} u(t) + \frac{C(q)}{D(q)} e(t)$$

Based on the physics of the situation, this would clearly be the most accurate model. In fact, given that the information matrix is a simple sum of inputs, a Markov model should be possible. To generate this metamodel, the measurement data would be collated for each of the 949 sensors (with up to 58 measurements each). Data for each sensor would be used to recursively identify an Autoregressive model that included past as well as current values of inputs and outputs. This metamodel could be used in the situation when the state of the sensor (number of measurements for a given emitter, current and past measurements, and estimates of the CEP) is known.

The second metamodel considered did not attempt to actually model the DF estimation process. This metamodel was a little more abstract and used the running total of the elements of the information matrix as inputs. In this way, the state of the sensor is fully incorporated in the input data and an output error model structure could be used:

$$y(t) = \frac{B(q)}{F(q)}u(t) + e(t)$$

The output-error structure was selected. First, it used data that was directly available from TERSM without additional processing. Second, it would be simpler to use as a module in another (larger) simulation because the state of the sensor is not required and it more closely resembles the level of abstraction in previous work. Third, the resulting model would be of significantly lower order and consequently contain fewer degrees of freedom to fit the data. Good results would be more difficult to obtain. At first this may not seem logical. But, the purpose of the research was to understand the process of metamodeling, not to metamodel a particular simulation. Errors in the process of identification are much more evident in lower order models.

3.1. Results

The first metamodel was based on the three primary inputs: the number of DF cuts available to the sensor, the range along-track, and the cross-track range. CEPs calculated with this model were not very accurate. The maximum absolute error was 4,984nm, the average error was 166nm, and average absolute relative error was 385%. Using this data, there were 719 emitters with a lower bound on the CEP of less than 5nm. Adding range as an input reduced the number of emitters found with lower bounds on the CEP less than 5nm to 670. In all of the above cases there was considerable correlation in the residual terms.

At this time, $1/\text{range}$, and the combinations of ranges that were actually used to compute the information matrix, were added to the input bringing the total number of inputs to 6. While the errors for the additional inputs improved, there was still considerable structure in the residuals. Final performance, the number of emitters with a lower bound of the CEP, only improved slightly to 653 (well above the actual number of 329).

Given a known system, every projection of that system into a subspace will reduce the information content of the observed behavior. The only exception to this is the situation where the kernel of the projection coincides with the null space of the behavior.

In the usual case of inverse modeling, the structure of the system is not known. However, if the dynamics of the system are available (as in a simulation) or can be assumed, it is possible to determine the number of processes that are present in the interconnected system.

During the metamodeling (inverse modeling) process, it is imperative to model only one system. Otherwise, behaviors associated with both processes will be aliased, preventing the identification of either.

From the above discussion, it is obvious that the TERSM output is the result of two separate processes. This is an important issue. In reality, the CEP should be a piecewise continuous function of the number of measurements and the angular separation of the measurements; a single process based on the geometry of the aircraft and emitter and the statistics of individual measurements. The simulated model in TERSM, however, was a discontinuous function of the uncertainty ellipse. Since the purpose of the metamodel is to represent the simulation, two separate systems had to be modeled.

Based on the value of σ_x/σ_L , the input data was separated. Two identifications, one for each system, were accomplished. The results were immediate, the cross correlation between the output and inputs were within limits, the maximum absolute error was 387nm, the average error was .3656nm, the average absolute error was .8508nm, and the average absolute relative error was 2.9%. Using this data there were 301 emitters with a CEP lower bound less than 5nm. This metamodel was based on the (first) half of the data that had an average CEP of 140nm. The remaining data was used to determine the quality of the model.

Since the interest was in emitters with a CEP of 5nm or less, another identification was accomplished using data from the second half of the simulated run. During this portion of the profile, the sensor has more data and can provide a better estimate of the emitter location. The average lower bound for this half of the data was 32nm. Again, the residuals for each system were within limits. For this metamodel, the maximum absolute error was significantly less at 142nm. This improvement came at the cost of a slight bias with a higher average error of 1.1nm and average absolute error of 1.2nm. However, the average absolute relative error was .8%; significantly less than the metamodel based on the first half of the data.

The range of the data makes visual presentation of the results difficult. If all data points are plotted, it is not possible to determine a difference in the actual and metamodeled data. Figure 3.1.3 is a plot of the last 976 data points that had a lower bound of the CEP between 5 and 6 nm -- a range that is much less than the average of the data (32nm during this portion of the simulation). Aggregate results with this metamodel were even better, of the 329 emitters with a CEP less than 5nm, this model predicted 326.

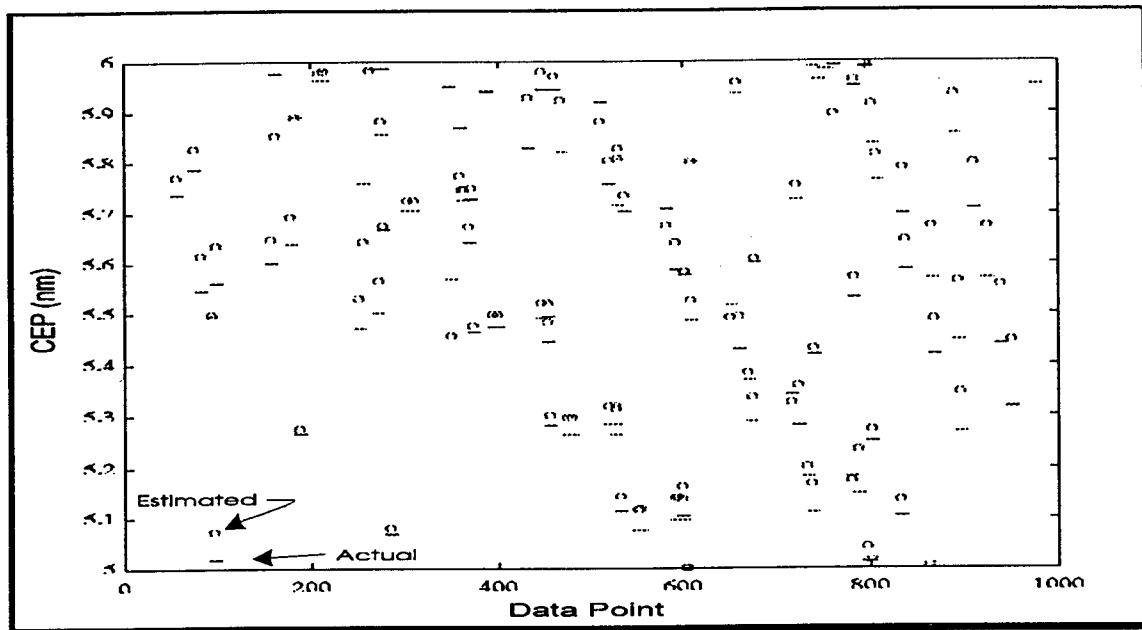


Figure 3.1.3. Actual Data and Metamodel Estimates for the Last 976 Data Points.

4. RESULTS AND CONCLUSIONS

This experiment demonstrated the framework for the application of system identification techniques to develop metamodels for tactical simulations used by the Department of Defense.

Issues identified under metamodeling combat simulations (Volume I, Chapter 3) must be explicitly addressed: nonlinearities must be built in; the experimental design must isolate the system for identification (identification of multiple independent systems results in an ill-posed problem that fails mathematically); the domain of the input must be relevant to the issues that are to be addressed by the metamodel; and finally, the accuracy of the model must be adequate to meet *a priori* requirements.

Metamodeling simulations, as opposed to data from an unknown source, provides the ability to structure the experimental design so that very accurate identification of the system or systems is possible. This knowledge also allows control over the input to the Identification algorithm so that the domain and range of the metamodel can be controlled.

In addition to meaningful results for each metamodel, the identification of system models brings with it a large library of research generated to advance the estimation and control of linear and nonlinear systems.

5. REFERENCES

1. M. A. Zeimer, et al, "Metamodel Procedures for Air Engagement Simulation Models," *IRAE Technical Report*, January 1993.

CHAPTER 4

STOCHASTIC MARKOV METAMODEL

1. INTRODUCTION

In the first three chapters of this volume, we analyzed or developed a static least squares and an output error metamodel. This chapter presents the identification of a stochastic Markov metamodel of TERSM signal processing. This development uses the Ito stochastic development from Volume I, Chapter 5, Section 5.3 and following.

For this experiment, TERSM data for two specific emitters were collected. Data from the first emitter was used to develop the metamodel while data from the second emitter was used to verify the results.

Minimization of the objective function was accomplished using Adaptive Simulated Annealing.

2. ITO STOCHASTIC MODEL

While nonlinear models for the process were evaluated, adequate results were obtained from the following linear stochastic model:

$$dx(t) = a(t)x(t)dt + g(t)d\beta(t)$$

where $d\beta(t)$ is Brownian motion of diffusion $q(t)$. With $f[\xi, t] = a(t)\xi$, and $G[\xi, t]Q(t)G[\xi, t] = g^2(t)q(t)$ the forward Kolmogorov equation becomes:

$$\frac{\partial f_x}{\partial t} = - \left[a(t)\xi \frac{\partial f_x}{\partial \xi} + a(t)f_x \right] + \frac{1}{2} g^2(t)q(t) \frac{\partial^2 f_x}{\partial \xi^2}$$

Using the characteristic function $\phi_x(\mu, t) = \int_{-\infty}^{+\infty} e^{j\mu\xi} f_{x(t)}(\xi) d\xi$, this equation can be reduced to the following equations for propagating the mean and covariance of $f_{x(t)}(\xi, t)$:

$$\dot{\hat{m}}_x(t) = a(t)\hat{m}_x(t)$$

$$\dot{P}_x(t) = 2a(t)P_x(t) + g^2(t)q(t)$$

In the process of optimization for a stochastic process, both the absolute error at each step and the covariance of the rate of change must be minimized. Allowing the identification of mean dynamics without constraining the variance of about mean can result in much of the fitting error being attributed to the diffusion in the process. In order to accomplish this combined optimization, a "Lagrangian" based objective function was used. The objective function for the optimization was $L = T - U$, where T represents the kinetic energy in the

error and the U is a "generalized" potential. The kinetic energy in the error "e" is proportional to de^2 combined with the covariance of the error. Therefore:

$$T = de^2 + P_x(t)$$

Because we are dealing with an Ito stochastic differential equation (to maintain the Markov property) the calculation of the change in the error, de , requires the use of the Ito differential rule of equation. Defining $e = (CEP(t_i) - x(t_i))$, use of this rule results in:

$$de(t_i) = 4dx(x(t_i) - CEP(t_i)) + g^2(t)q(t)$$

The generalized potential is directly proportional to the magnitude of the error $U = CEP(t_i) - x(t_i)$.

3. RESULTS

The resulting objective function was minimized subject to the system equation using ASA. Results are shown in Figure 4.3.1. The maximum absolute error was 15.8566nm, the average error was -2.0667nm, the average absolute error was 2.1339nm, and the average absolute relative error was 0.1973%. Run time for the search was 2 minutes, 11 seconds.

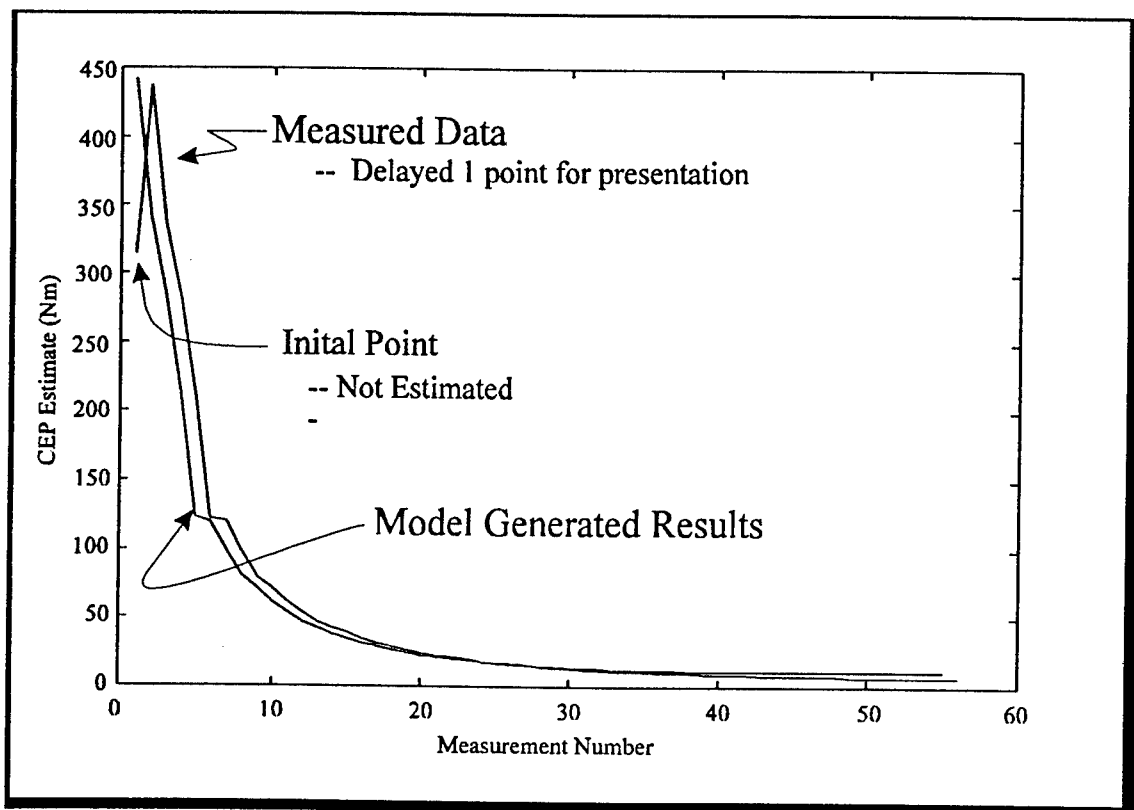


Figure 4.3.1. Comparison of Actual and Modeled Data.

Additional experimentation with the objective function demonstrated a surprising degree of flexibility. If only the final error was penalized, the estimation error slowly converged to zero at the last measurement. A quicker response (at the same order) resulted in an underdamped system with multiple overshoots.

4. CONCLUSIONS

This demonstration illustrated the feasibility of using Ito stochastic metamodels to accurately represent complex behaviors. For stochastic systems, both the absolute error at each step and the covariance of the rate of change must be minimized. Differentiation must be accomplished using the Ito differential rule.

Initialized properly, Adaptive Simulated Annealing provides a method of identifying systems modeled with stochastic differential equations. The ease of use (after the learning curve) combined with the fact that a global minimum is statistically guaranteed, makes this an excellent technique for identification of complex, linear or nonlinear, deterministic or stochastic systems. ASA is also a good selection to verify or improve upon less robust optimization procedures.

CHAPTER 5

SIMTAX FEATURE SPACE AND RESULTS

1. INTRODUCTION

1.1. Chapter Summary

This chapter presents the results of an analysis of 162 Combat Simulations selected from the *Catalog of Wargaming and Military Simulation Models, 11th Edition*, compiled by the Force Structure, Resource, and Assignment Directorate (J-8) [1]. The analysis was accomplished to identify significant characteristics and group the types of problems facing the Air Force Analyst and Engineer. This analysis used the metamodeling feature space defined in Chapter 5, Air Force Metamodeling Problems.

1.2. Scope

This analysis supported the objective of defining classes of Air Force metamodeling problems based on the simulations. Table 5.1.1. presents the simulation categories and subcategories that were entered into the "SIMTAX" database used for this research. All of the simulations tabulated under each heading were entered.

Table 5.1.1. Catalog categories selected for SIMTAX.

CATEGORY	SUBCATEGORY
COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE (less strategic systems)	
CONFLICT OTHER THAN STRATEGIC NUCLEAR	AWACS Air Base Attack/Tactical Support Air Combat - Many on Many Air Combat - One on One Air Defense Air Forces Only Air/Ground - Conventional Conflict Reconnaissance
ELECTRONIC WARFARE	
INTELLIGENCE	
WEAPONS SYSTEMS SIMULATIONS	Air Systems Fixed Wing Ground Systems Special Systems

1.3. Overview

The simulations in the above categories were entered into a Paradox database that had fields corresponding to the feature space. This database was called SIMTAX.DB. Since a simulation could have multiple entries for any particular field that corresponded with different setup options, SIMTAX.DB had a separate entry for each of the possible capabilities. This database is included as Appendix A.

Another database was developed for each field of SIMTAX.DB that contained the approved abbreviation for the entry and a unique binary vector that was identified with this particular entry. The feature vector was generated through a query that generated as the output, the catalog, simulation category and subcategory, simulation name, and the feature vector of the simulation.

The output of the query, another database table, was exported to an ASCII flat file that was tab delimited. This file was read by a MATLAB M-file that converted the ASCII file to the MATLAB matrix format.

Once in the MATLAB format, the separate catalog entries for each simulation were converted from strings to numbers (where appropriate), and combined so that there was one feature vector for each simulation. Then the simulations were grouped by category and subcategory defining the number of entered categories and the number in each category.

For each of the separate categories, each bit in the feature vector was evaluated to determine the relative frequency of occurrence, the variation, and the range of the bit values (this should be zero or 1). From this data, the most likely value for each bit was computed and combined into a "characteristic" vector for the category.

Now that a characteristic vector was defined for each category, this vector was used as the centroid of a cluster for the category and the distance from each simulation to all of the characteristic vectors (one defined for each category) was determined and sorted by distance for the center of the category of which it was a member..

2. DATABASES USED TO SUPPORT THE BUILDING OF THE FEATURE VECTOR

2.1. Introduction

This section provides the structure of all database tables, and the entries for the field databases that generated the feature vector. These tables follow Chapter 5 with a single exception. In development of this vector, selections from "analytical" and "training and education" were combined into a single table defining the model type.

The SIMTAX database was organized as follows (all fields were alphanumeric):

Table 5.2.1. SIMTAX Database Structure.

FIELD	NAME	SIZE
1	Catalog	75
2	Category	100
3	Type	100
4	Simulation	10
5	Model Type	100
6	Domain	15
7	Span	15
8	Environment	25
9	Force Composition	15
10	Scope of Conflict	20
11	Mission Area	20
12	Level of Detail	20
13	Construction	45
14	Time Processing	20
15	Treatment of Randomness	65
16	Sidedness	45
17	Input	80
18	Output	80

The mission area, level of detail, input, and output fields were not used for this analysis. All of the remaining fields were coupled to the feature vector as depicted in the following tables:

Table 5.2.2. Model Type Database

ABBR	DESCRIPTION	VECTOR
A	Analysis	1 0 0 0 0 0 0 0 0 0
A-OST	Analysis, operation support tool (decision aid)	0 1 0 0 0 0 0 0 0 0
A-RE	Analysis, research and evaluation (R&E) tool	0 0 1 0 0 0 0 0 0 0
A-RE-CD	Analysis, (R&E) tool - combat development	0 0 0 1 0 0 0 0 0 0
A-RE-FCR	Analysis, (R&E) tool - force capability and reqmnts	0 0 0 0 1 0 0 0 0 0
A-RE-WS	Analysis, (R&E) tool dealing with weapon systems	0 0 0 0 0 1 0 0 0 0
EDU	Education	0 0 0 0 0 0 1 0 0 0
T/E	Training and education	0 0 0 0 0 0 0 1 0 0
T/E-ED	Training and education, exercise driver	0 0 0 0 0 0 0 0 1 0
T/E-SD	Training and education, skills development	0 0 0 0 0 0 0 0 0 1
TR	Training	0 0 0 0 0 0 0 0 0 1
N/A	Not Applicable	0 0 0 0 0 0 0 0 0 0

Table 5.2.3. Domain Database.

ABBREVIATION	DESCRIPTION	VECTOR
A	Air	1 0 0 0 0 0 0 0 0 0
AB	Airbase	0 1 0 0 0 0 0 0 0 0
ABS	Abstract	0 0 1 0 0 0 0 0 0 0
CO	Coast	0 0 0 1 0 0 0 0 0 0
L	Land	0 0 0 0 1 0 0 0 0 0
N	Naval	0 0 0 0 0 1 0 0 0 0
POL	Politics	0 0 0 0 0 0 1 0 0 0
S	Sea	0 0 0 0 0 0 0 1 0 0
SP	Space	0 0 0 0 0 0 0 0 1 0
US	Undersea	0 0 0 0 0 0 0 0 0 1
N/A	Not Applicable	0 0 0 0 0 0 0 0 0 0

Table 5.2.4. Span Database.

ABBREVIATION	DESCRIPTION	VECTOR
GEO	Geographic area	1 0 0 0 0 0 0 0 0 0
GLOB	Global	0 1 0 0 0 0 0 0 0 0
IND	Individual	0 0 1 0 0 0 0 0 0 0
INTER	Intertheater	0 0 0 1 0 0 0 0 0 0
INTRA	Intratheater	0 0 0 0 1 0 0 0 0 0
LOC	Local	0 0 0 0 0 1 0 0 0 0
REG	Regional	0 0 0 0 0 0 1 0 0 0
SECT	Sector	0 0 0 0 0 0 0 1 0 0
TH	Theater	0 0 0 0 0 0 0 0 1 0
N/A	Not Applicable	0 0 0 0 0 0 0 0 0 0

Table 5.2.5. Environment Database.

ABBR	DESC	VECTOR
A	Air	1000000000000000000000000000000000000000
BAR	Barrier	0100000000000000000000000000000000000000
BAT	Battlefield	0010000000000000000000000000000000000000
CAN	Canalization	0001000000000000000000000000000000000000
CF	Cultural features	0000100000000000000000000000000000000000
COM	Communications	0000010000000000000000000000000000000000
DES	Deserts	0000001000000000000000000000000000000000
D/N	Day and night	0000000100000000000000000000000000000000
DT	Digitized terrain	0000000010000000000000000000000000000000
EAR	Earth	0000000001000000000000000000000000000000
EW	Elect. Warfare	0000000000100000000000000000000000000000
FOR	Forestation	0000000000010000000000000000000000000000
GEO	Geography	0000000000001000000000000000000000000000
HEX	Hex-based	0000000000000100000000000000000000000000
JU	Jungles	0000000000000001000000000000000000000000
L	Land	0000000000000000010000000000000000000000
MET	Met conditions	0000000000000000001000000000000000000000
S	Sea	0000000000000000000100000000000000000000
SEAS	Seasons	0000000000000000000001000000000000000000
SP	Space	0000000000000000000000100000000000000000
SS	Sea States	0000000000000000000000010000000000000000
S/S	Sunrise & sunset	0000000000000000000000000100000000000000
TD	Time of day	0000000000000000000000000001000000000000
TEMP	Temperature	0000000000000000000000000000010000000000
TER	Terrain	0000000000000000000000000000001000000000
TF	Trans factors	0000000000000000000000000000000100000000
TRAF	Trafficability	0000000000000000000000000000000001000000
URB	Urban	0000000000000000000000000000000000010000
UW	Underwater	0000000000000000000000000000000000000100
VEG	Vegetation	0000000000000000000000000000000000000010
W	Weather	0000000000000000000000000000000000000001
N/A	Not Applicable	00

Table 5.2.6. Force Composition Database.

ABBREVIATION	DESCRIPTION	VECTOR
AB	Airbase	1 0 0 0 0 0
COMB	Combined	0 1 0 0 0 0
CONC	Conceptual	0 0 1 0 0 0
COMP	Component	0 0 0 1 0 0
CORPS	Corps	0 0 0 0 1 0
ELEM	Element	0 0 0 0 0 1
JF	Joint	0 0 0 0 0 1
N/A	Not Applicable	0 0 0 0 0 0

Table 5.2.7. Scope of Conflict Database.

ABBREVIATION	DESCRIPTION	VECTOR
BIO	Biological	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
CH	Chemical	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
CONV	Conventional	0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
DET	Detection	0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
ELEC	Elec. combat/warfare	0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
KIN	Kinetic	0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0
LAS	Laser	0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0
MIN	Mines	0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0
NONSTR	Nonstrategic	0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0
NUC	Nuclear	0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
POL	Political	0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
RA	Rear area	0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0
SPEC	Special	0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0
STRAT	Strategic	0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0
UNC	Unconventional	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
VER	Verification	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
N/A	Not Applicable	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Table 5.2.8. Time Processing Database

ABBREVIATION	DESCRIPTION	VECTOR
DYN	Dynamic	1 0 0 0 0 0
DYN-CF	Dynamic, closed form	0 1 0 0 0 0
DYN-ES	Dynamic, event-step	0 0 1 0 0 0
DYN-TS	Dynamic, time-step	0 0 0 1 0 0
STATIC	Static	0 0 0 0 1 0
STATIS	Statistical	0 0 0 0 0 1
N/A	Not Applicable	0 0 0 0 0 0

Table 5.2.9. Human Participation Database.

ABBR	DESCRIPTION	VECTOR
NP	Not permitted	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
NR	Not required	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
NR-INT	Not required, model interruptable	0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
NR-SC	Not required, scheduled changes	0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
REQ	Required	0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
REQ-A	Required for analysis	0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0
REQ-D	Required for decisions	0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0
REQ-P	Required for processes	0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0
REQ-DP	Required for decisions & processes	0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0
REQ-GR	Required for graphics	0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
REQ-I	Required for input	0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0
REQ-ID	Required for interactive decisions	0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0
REQ-SU	Required for setup	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
U-I	User-interactive	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
N/A	Not Applicable	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Table 5.2.10. Treatment of Randomness Database.

ABBREVIATION	DESCRIPTION	VECTOR
DET	Deterministic	1 0 0 0 0
DET-EV	Deterministic, function of expected value	0 1 0 0 0
STO	Stochastic	0 0 1 0 0
STO-DC	Stochastic, direct computation	0 0 0 1 0
STO-MC	Stochastic, Monte Carlo	0 0 0 0 1
N/A	Not Applicable	0 0 0 0 0

Table 5.2.11. Sidedness Database.

ABBREVIATION	DESCRIPTION	VECTOR
1	One-sided	1 0 0 0 0 0 0 0 0 0
1NR	One side nonreactive (same for reactive)	0 1 0 0 0 0 0 0 0 0
2	Two-sided	0 0 1 0 0 0 0 0 0 0
3	Three-sided	0 0 0 1 0 0 0 0 0 0
A	Asymmetric	0 0 0 0 1 0 0 0 0 0
NR	Nonreactive	0 0 0 0 0 1 0 0 0 0
R	Reactive	0 0 0 0 0 0 1 0 0 0
RED-NR	RED side nonreactive (same for BLUE)	0 0 0 0 0 0 0 1 0 0
S	Symmetric	0 0 0 0 0 0 0 0 1 0
N/A	Not Applicable	0 0 0 0 0 0 0 0 0 0

3. DATABASE QUERY AND STRUCTURE

The structure of the query is important because it defines the output and the order of the output vectors. Subsequent components that function on the output must insure that the structure is as expected. The structure of this query is shown in Figure 5.3.1.

DOMAIN DB	ABBREVIATION	DOMAIN	Vector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> EG02	<input checked="" type="checkbox"/> +AS Domain
SPAN DB	ABBREVIATION	SPAN	Vector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> EG03	<input checked="" type="checkbox"/> +AS Span
ENVIRON DB	ABBREVIATION	ENVIRONMENT	Vector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> EG04	<input checked="" type="checkbox"/> +AS Environment
FORCE DB	ABBREVIATION	FORCE COMPOSITION	Vector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> EG05	<input checked="" type="checkbox"/> +AS Force
SCOPE DB	ABBREVIATION	SCOPE OF CONFLICT	Vector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> EG08	<input checked="" type="checkbox"/> +AS Scope
HUMAN DB	ABBREVIATION	CONSTRUCTION	Vector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> EG09	<input checked="" type="checkbox"/> +AS Human
TIME DB	ABBREVIATION	TIME PROCESSING	Vector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> EG10	<input checked="" type="checkbox"/> +AS Time
RANDOM DB	ABBREVIATION	TREATMENT OF RANDOMNESS	Vector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> EG11	<input checked="" type="checkbox"/> +AS Random
SIDES DB	ABBREVIATION	SIDEDNESS	Vector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> EG12	<input checked="" type="checkbox"/> +AS Sides
TYPE DB	ABBREVIATION	Model Type	Vector
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> EG01	<input checked="" type="checkbox"/> +AS Type

Figure 5.3.1. Paradox Query.

4. METAMODELING FEATURE VECTOR

The output of the above query, another database table, was exported to an ASCII flat file that was tab delimited. An example of the ASCII file follows:

```
J-8 Models Catalog 11th Edition CONFLICT OTHER THAN STRATEGIC NUCLEAR
  Air Combat - Many on Many AASPEM 000001000001000000000000
010000001000000000000000000000000000000000000000000000010
0001000000000000000000010000000000000000100000010001
0000000
```

This file was read by a MATLAB M-file that converted the ASCII file to the MATLAB matrix format.

Once in the MATLAB format, the separate catalog entries for each simulation were converted from strings to numbers (where appropriate), and combined so that there was one feature vector for each simulation. Then the simulations were grouped by category and subcategory defining the number of entered categories (15) and the number in each category.

For each of the separate categories, each bit in the feature vector was evaluated to determine the relative frequency of occurrence, the variation, and the range of the bit values (this should be zero or 1). From this data, the most likely value for each bit was computed and combined into a "characteristic" vector for the category.

5. METAMODELING CLASSES

Once the feature space that encompasses the selected metamodeling problems is defined, the next step is to determine classes of metamodeling problems. This is accomplished by evaluating the density of the metamodeling problems in the feature space and, based on the characteristics of the space, selecting criteria for clustering. Classes of simulations are then defined by these clusters.

The classification of simulations defined in this manner requires clustering via nonparametric techniques. In this case the selection of the "metric" is critical [2].

5.1. Metric Spaces

A metric space is a pair of objects, a set X and a metric, or distance function, d . The metric $d(x,y)$ is a real valued function satisfying the following axioms [3]:

$$\begin{aligned}d(x,y) > 0 \quad d(x,x) = 0 \quad \forall x,y \in X \\ \text{if } d(x,y) = 0 \implies x = y \quad \forall x,y \in X \\ d(x,y) = d(y,x) \quad \forall x,y \in X \\ d(x,y) \leq d(x,z) + d(z,y) \quad \forall x,y \in X\end{aligned}$$

For the type of information we are trying to extract from the feature vector, we can define the following metric:

Let $X(n)$ is the set of all ordered n -tuples of "zeros" and "ones." For example:

$$X(2) = \{00, 01, 10, 11\}$$

Let $d(x, y)$ = the number of places where x and y have different entries. Then $(X(n), d)$ is a metric space that satisfies the above axioms.

5.2. Nonparametric clustering techniques

If the clusters are separated, even if they are a different diameter, **separating hyperplanes** (decision surfaces) can be defined that associate a measurement with a cluster. This technique will not work with overlapping clusters. The **K-nearest neighbor** technique should be used for overlapping clusters that are equally likely. In this case, the number of points in the cluster define a priori status probability of occurrence.

The **nearest prototype** technique will provide the nearest centroid regardless of the dispersion. Each class/aspect combination is represented by a cluster centroid, and each element is assigned to the cluster with the shortest measurement-to-prototype distance.

Classification by any of these clustering techniques will not provide an indication of the confidence of the choice.

5.3. Binary Vector Space Analysis

An analysis of the total binary vector space (cardinality = 162, dimension = 125) where D_{ij} is the difference between feature vectors showed that:

$$\min_{i, j \in V} (D_{ij}) = 1 \quad i \neq j$$

and therefore, no two simulations are the same and $(X(n), d)$ is a valid metric space (computed by $\min(Y(2, :))$ in sortbyd.m). Also:

1. The maximum distance between any two simulations $\left(\max_{i, j \in V} (D_{ij}) \right)$ was 34.
(Computed by $\max(Y(n, :))$ in sortbyd.m).
2. The maximum value $\left(\max_{j \in V} \left(\min_{i \in V} (D_{ij}) \right) \right)$ of the minimum separation between any two simulations was 20. (Computed by $\max(Y(2, :))$ in sortbyd.m).
3. The average closest distance between all simulations is 7.44
4. The standard deviation of the closest distance is 3.64

Further use of difference between feature vectors (D_{ij}) to develop clusters of simulations is being investigated. Since this measure primarily provides a direct indication of the complexity of the simulation, clusters based on the distance may provide useful groups for defining metamodel structures.

Recall that a characteristic vector was defined for each category. This vector was used as the centroid of a cluster for the category and the distance from each simulation to all of the characteristic vectors (one defined for each category) was determined and sorted by distance for the center of the category of which it was a member. Figure 5.5.1 is a plot of the distance of the simulations from it's cluster center.

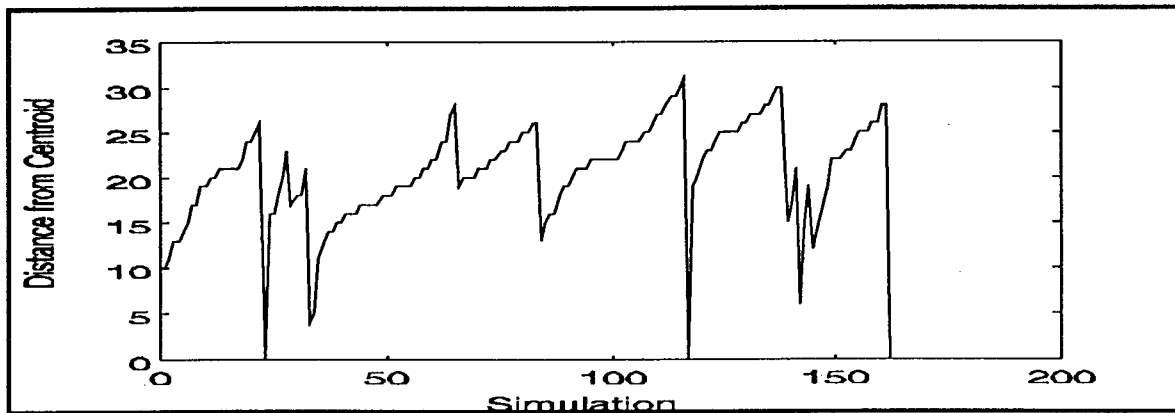


Figure 5.5.1. *Sorted distance from the Cluster Centroid.*

From this plot (and the data) we see that there are three clusters with a single simulation, and that there are six additional clusters with less that five simulations. These eight clusters should eventually be consolidated with the seven larger clusters.

Figure 5.5.2 is a plot of the distance of all of the simulations from the centroid of the first category. This plot shows that many of the simulations not in the cluster are within its boundary and that the clusters require further refinement.

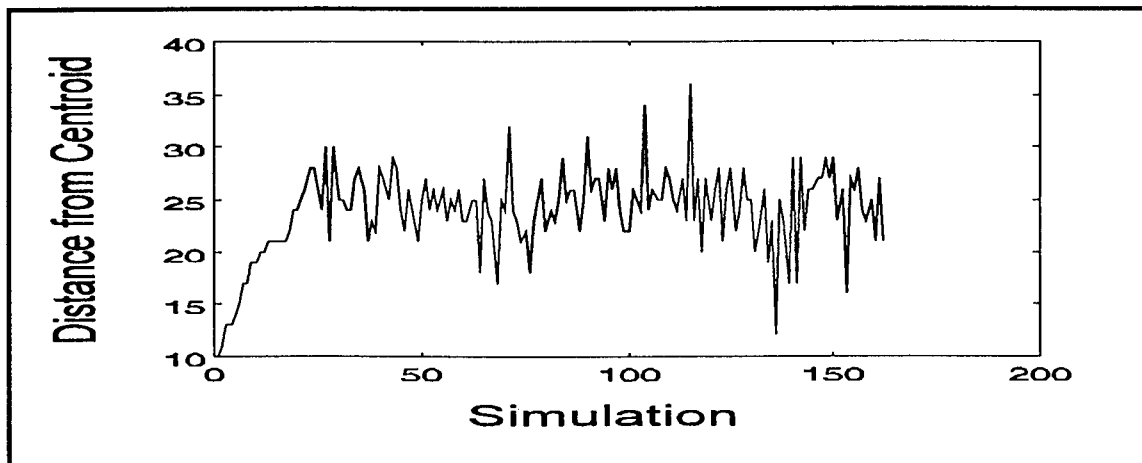


Figure 5.5.2. *Distance of all simulations from the first the Cluster Centroid.*

A final graphic displays the same type of information shown in Figure 5.5.2 for simulations and all categories.

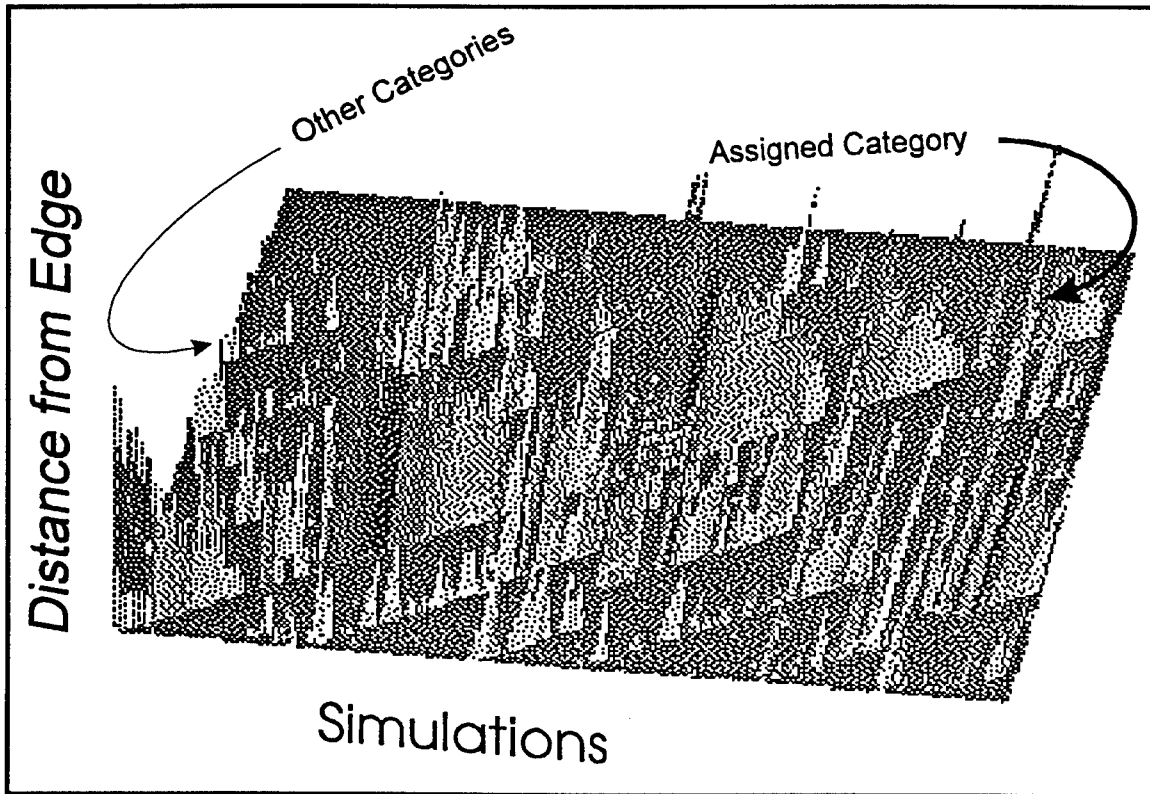


Figure 5.5.2. Distance of all simulations from all Cluster Centroids.

6. REFERENCES

1. *Catalog of Wargaming and Military Simulation Models, 11th Edition*, Force Structure, Resource, and Assignment Directorate (J-8), The Joint Staff, Washington, DC 20318-8000, September 1989.
2. *Modeling of Complex Systems*, V. Vemuri, Academic Press 1978.
3. A. W. Naylor, and G. R. Sell. *Linear Operator Theory in Engineering and Science*, New York: Springer Verlag 1982.

CHAPTER 6

MODEL ORDER SELECTION

1.1 INTRODUCTION

This Chapter presents the results of experiments to determine model order using the generalized (method independent) technique of Canonical Correlation Analysis.

1.2 MODEL ORDER SELECTION USING CANONICAL VARIATE ANALYSIS

1.2.1 Canonical Representations

Given a set X and an equivalence relation¹, denoted \sim , on that set, we can decompose the set into subsets each composed of elements that are equivalent to each other. This decomposition results in a quotient set of subsets of X . Given a set X and an equivalence relation \sim , a subset C of X will be a set of canonical forms for X under \sim if for every $x \in X$ there exists one and only one $c \in C$ such that $x \sim c$ [1].

Our canonical representation will consist of the first maximum set of independent elements within the sequence of predictors [2]. For linear systems, orthogonality was sufficient to insure independence. For nonlinear systems, stochastic independence is required [3]. Analysis of a set of canonical variates can be used to trade off the bias due to low order model versus the additional variability introduced by too high an order. This analysis is concerned with the canonical representation of the correlation between two sets of random variables [2,4].

1.2.2 Problem Statement

The CVA technique for model order determination was used to estimate the order of the Lorenz attractor with process excitation noise. The Lorenz attractor is a Markov process with the following state equations:

$$\begin{aligned}\dot{x}_1 &= \sigma(x_2 - x_1) \\ \dot{x}_2 &= -\rho x_1 - x_2 - x_1 x_3 \\ \dot{x}_3 &= -\beta x_3 + x_1 x_2\end{aligned}$$

In the simulation, $\sigma = 10$, $\rho = 28$, $\beta = \frac{8}{3}$, which results in Chaotic behavior. The differential equations were discretized with $\Delta t = .01$. White process excitation noise with a covariance of $\eta = I \times 10^{-4}$ was added as shown below:

$$\begin{aligned}x_1(t+1) &= x_1(t) + \Delta t \sigma (x_2(t) - x_1(t)) + \eta_1 \\ x_2(t+1) &= x_2(t) - \Delta t [\rho x_1(t) - x_2(t) - x_1(t)x_3(t)] + \eta_2 \\ x_3(t+1) &= x_3(t) - \Delta t [\beta x_3(t) + x_1(t)x_2(t)] + \eta_3\end{aligned}$$

¹The properties of an equivalence relation are: Transitivity, Symmetry, and Reflexivity

Figures 6.2.1 through 6.2.3 present the phase plane outputs of the Lorenz attractor. The data used to determine the order consisted of measurements of the first state which is shown in Figure 6.2.4.

1.2.3 CVA Setup

CVA requires that the data be separated into past and future vectors. The Hilbert space that defined the past data was approximated by a polynomial of up to degree three in the past three lags.

$$p(t) = f_{i_1, i_2, i_3}(x_1(t-1), x_1(t-2), x_1(t-3)) = (x_1(t-1))^{i_1} (x_1(t-2))^{i_2} (x_1(t-3))^{i_3}$$

for $i_1 + i_2 + i_3 \leq 3$.

A computer routine was developed to generate the input polynomials. They were built sequentially by degree, by variable sequence, and by then set. Given 3 input terms (lags of the input variable) input polynomials are built as shown below:

By Degree	P1	P2	P3	=> degree = 1	
By Seq	P1P1	P1P2	P1P3	=> degree = 2 /	variable 1
	P2P2	P2P3		=>	variable 2
	P3P3			=>	variable 3
By Set	P1P1P1	P1P1P2	P1P1P3	=> degree = 3 /	variable 1 / set P1P1
	P1P2P2	P1P2P3		=>	set P1P2
	P1P3P3			=>	set P1P3
	P2P2P2	P2P2P3		=>	/ variable 2 / set P2P2
	P2P3P3			=>	set P2P3
	P3P3P3			=>	/ variable 3 / set P3P3

The routine functioned by determining the repeated sequences and the first term in the sequence that made up the next series of terms. The routine was manually verified up to 4 variables to degree 6 (210 terms) and 5 variables to the 5th degree (252 terms). The routine generates the proper number of terms for 4 variables up to degree 4 (46376 terms).

There are 20 such input terms each set of three lags. Consequently, any $x_1(t)$ can affect up to 20 terms in the future and the future vector consists of:

$$f(t) = (x_1(t), x_1(t+2), \dots, x_1(t+20))$$

Data from the Lorenz attractor, Figure 6.2.4 was parsed into past and future terms. Input and output vectors were defined, beginning at $t = 4$, by the past three lags (which generate 20 terms) and 19 additional future outputs. Time was incremented until there were insufficient future variables to construct an input and output.

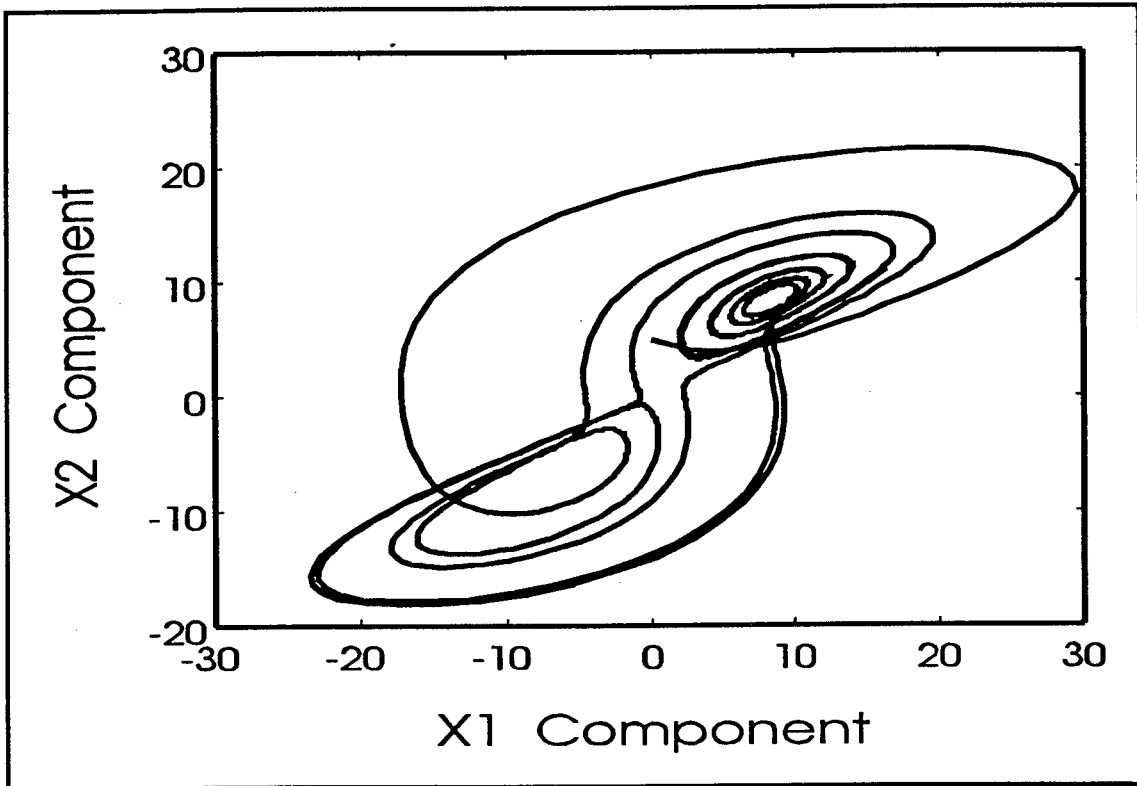


Figure 6.2.1 Phase Plane Plot of X_2 versus X_1 .

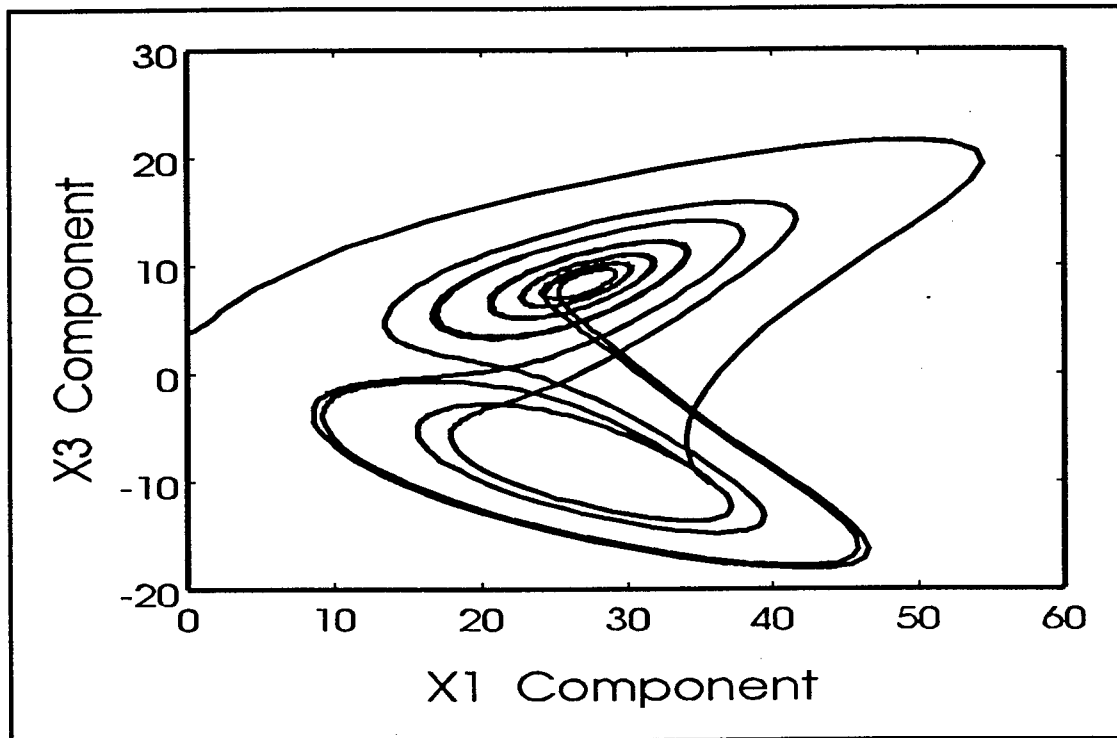


Figure 6.2.2 Phase Plane Plot of X_3 versus X_1 .

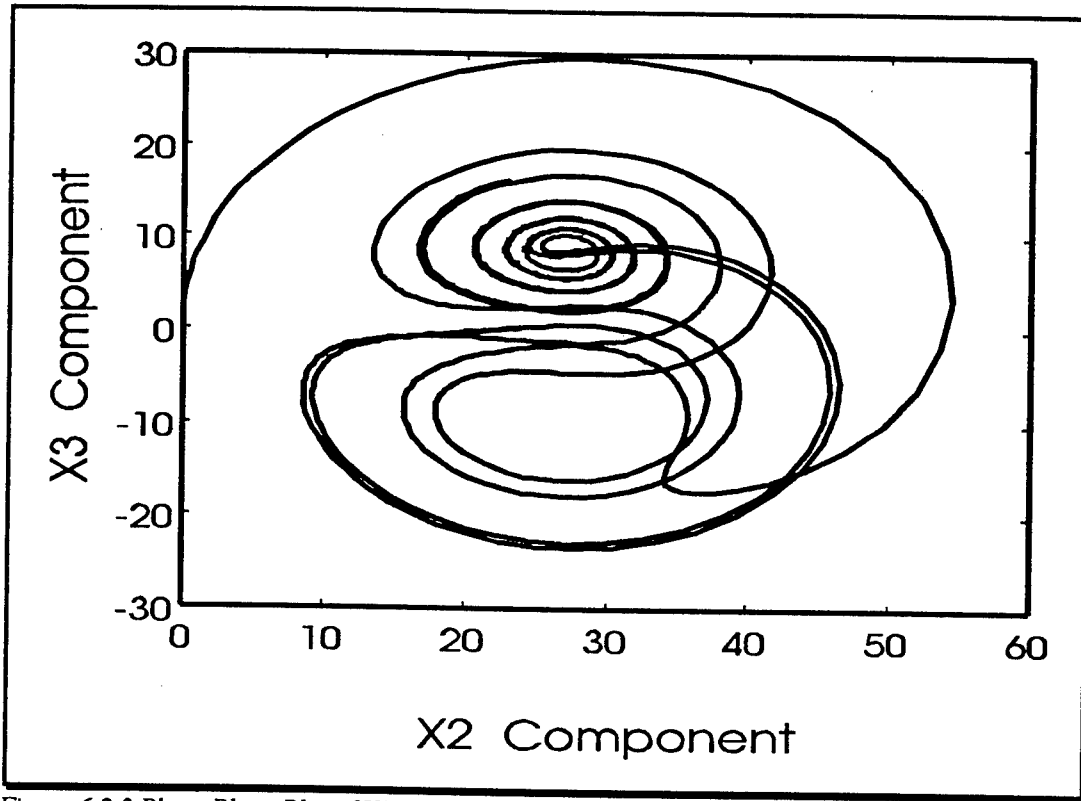


Figure 6.2.3 Phase Plane Plot of X_3 versus X_2 .

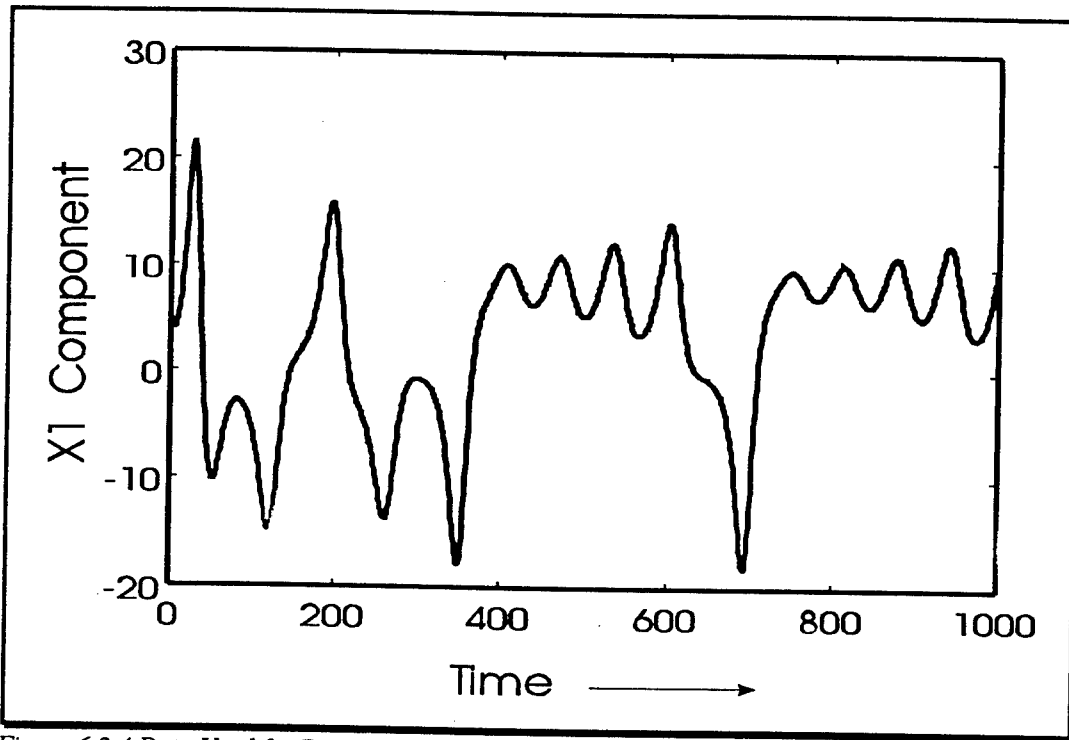


Figure 6.2.4 Data Used for Determination of Model Order.

1.2.4 Stochastically Independent CVA Results

The CVA algorithm described in Volume 1, Chapter 6 was used to determine the order of the system. This algorithm implements the Alternate Conditional Expectation (ACE) algorithm to generate the maximal correlation between the input and output function of the data. This resulted in stochastically independent inputs suitable for nonlinear systems. Table 6.2.1 is a comparison of the correlations for the stochastically independent results with previous work that used CVA with sequential selection of orthogonal input variables (optimal inputs for linear systems). Figure 6.2.5 is a plot of this comparison.

CANONICAL VARIATE	ORTHOGONAL INDEPENDENT VARIABLES	STOCHASTIC INDEPENDENT VARIABLES
1	0.9999	0.9999
2	0.9746	0.9981
3	0.9043	0.9921
4	0.6062	0.9165
5	0.3022	0.4155
6	0.1782	0.2953
7	0.1626	0.0433
8	0.1539	0.0100
9	0.1309	0.0012
10	0.0969	0.00007
11	0.0940	0.00001
12	0.0827	0.0000033
13	0.0686	0.0000010
14	0.0581	0.0000000924079
15	0.0461	0.0000000073800
16	0.0149	0.0000000040007
17	0.0102	0.0000000013386
18	0.0041	0.0000000000004
19	0.0011	

Table 6.2.1 Comparison of Correlations for Orthogonal and Stochastically Independent CVA.

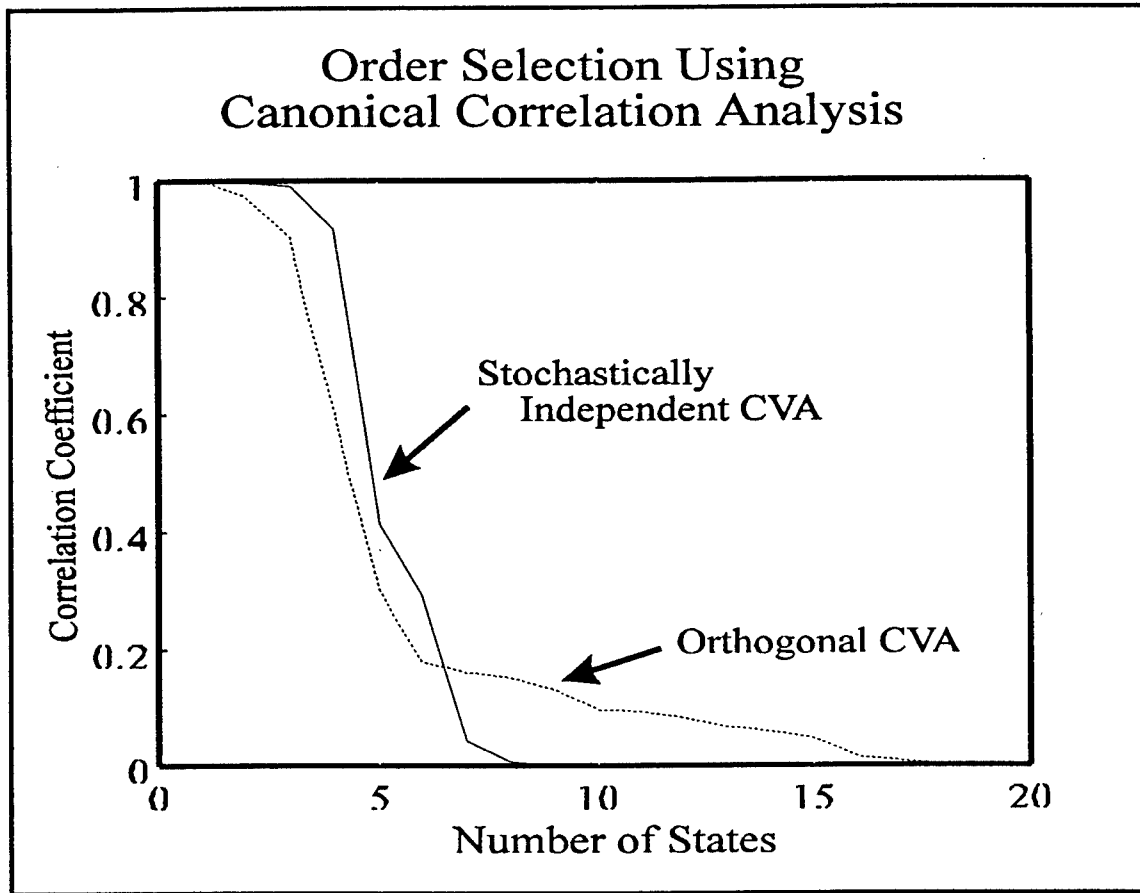


Figure 6.2.5. A Comparison of Results With Prior Results.

1.2.5 Stochastically Independent CVA Conclusions

There are 5 states in the Lorenz attractor, x_1 , x_2 , x_3 , x_1x_2 , and x_1x_3 . Consequently, an order selection routine should identify 5 variables required (noise free case). Both the Table and the Figure show the improved discrimination of the Stochastically Independent CVA technique with less significance allocated to the lower valued variates.

1.3 REFERENCES

1. T. Kailath, *Linear Systems*, Prentice-Hall, New Jersey, 1980.
2. H. Akaike, "Canonical Correlation Analysis of Time Series and the Use of an Information Criterion," *System Identification: Advances and Case Studies*, R.K. Mehra and D.G. Lainiotis, eds. Academic Press, New York, pp 27-96., 1976.
3. W.E Larimore, "System Identification and Filtering of Nonlinear Controller Markov Processes by Canonical Variate Analysis," Final Report for AF Office of Scientific Research, October 27, 1989.
4. B. Thompson, *Canonical Correlation Analysis*, Sage Publications, Beverly Hills, CA, 1984.

APPENDIX A

This Appendix presents the 162 Combat Simulations selected from the *Catalog of Wargaming and Military Simulation Models, 11th Edition*, compiled by the Force Structure, Resource, and Assignment Directorate (J-8) [1].

Simulation :	Model Type :			
<u>BONeS</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Global</u>	<u>Air</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>BONeS</u>	<u>Training</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>BONeS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>CEOPS</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Not Applicable</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Stochastic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>CEOPS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>CEOPS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>CEOPS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>COM/EW</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Communications</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for analysis</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic, function of an expected value</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>COM/EW</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Electronic Warfare</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>COM/EW</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>NS, Applicable</u>	

Simulation :	Model Type :			
<u>COMO ADC3</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Terrain</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>COMO ADC3</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Vegetation</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Symmetric</u>	

Simulation :	Model Type :			
<u>COMO ADC3</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Reactive</u>		

Simulation :	Model Type :			
<u>DESCEM</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Communications</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>DESCEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Stochastic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>DESCEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>DESCEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>EIEM</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Day and night</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>EIEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Digitized terrain</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>EIEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Meteorological conditions</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>EIEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>IMPACT</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Abstract</u>	<u>Individual</u>	<u>Communications</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JCS3</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Barrier</u>	<u>Joint</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>JCS3</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Digitized terrain</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>JCS3</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Transportation factors</u>	<u>Not Applicable</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Reactive</u>		

Simulation :	Model Type :			
<u>JCS3</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Undersea</u>	<u>Not Applicable</u>	<u>Urban</u>	<u>Not Applicable</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JTIDSC2</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Communications</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, direct computation</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JTIDSC2</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JTIDSC2</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JTIDSC2</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>MSEPAM</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Intratheater</u>	<u>Communications</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>MSEPAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Digitized terrain</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Not Applicable</u>		

Simulation : Model Type :
NAM Analysis, research and evaluation tool dealing with force capability and requirements

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Local Cultural features Combined Elec. combat/warfare

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for input

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic One-sided

Simulation : Model Type :
NAM Training and education, skills development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Theater Terrain Joint Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic Not Applicable

Simulation : Model Type :
NETSIM Analysis

Domain : Span : Environment : Force Composition : Scope of Conflict :
Abstract Not Applicable Communications Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for input

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Stochastic, direct computation One-sided

Simulation : Model Type :
NETSIM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for interactive decisions

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
NETWORK II Analysis

Domain : Span : Environment : Force Composition : Scope of Conflict :
Abstract Not Applicable Communications Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable One-sided

Simulation : Model Type :
PACES Analysis, operation support tool (decision aid)

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Communications Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not permitted

Time Processing : Treatment of Randomness : Sidedness :
Static Deterministic Not Applicable

Simulation : Model Type :
PACES Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Not Applicable Joint Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic, direct computation Not Applicable

Simulation : Model Type :
PACES Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Naval Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic, Monte Carlo Not Applicable

Simulation :	Model Type :			
<u>PACES</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>PEJ</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Communications</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>PLRS/EPLRS</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Terrain</u>	<u>Combined</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>PLRS/EPLRS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
Radar Analysis

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Not Applicable Communications Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for processes

Time Processing : Treatment of Randomness : Sidedness :
Static Stochastic, direct computation One-sided

Simulation : Model Type :
Radar Training

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for input

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
Radar Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
Radar Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Space Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation :	Model Type :			
<u>RCN</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Communications</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for setup</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>Space CEM</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Space</u>	<u>Component</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>Space CEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>Space CEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>Space CEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>TACSIM</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Battlefield</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>TACSIM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>TACSIM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
TMDC3ISIM Analysis, research and evaluation tool

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Digitized terrain Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required, model interruptable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Deterministic, function of expected value Two-sided

Simulation : Model Type :
TMDC3ISIM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Not Applicable Joint Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation : Model Type :
TMDC3ISIM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
WAAM Analysis, research and evaluation tool

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Global Not Applicable Element Nuclear

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Stochastic, Monte Carlo One-sided

Simulation :	Model Type :			
<u>WAAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>WAAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>WAAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>ALARM</u>	<u>Analysis, research and evaluation tool dealing with c Abat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Terrain</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, closed form</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>ALARM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>ALARMPP</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Air</u>	<u>Element</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>ALARMPP</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>ALARMSS</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Air</u>	<u>Element</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, closed form</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation : Model Type :
ALARMSS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Land Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Symmetric

Simulation : Model Type :
ALARMSS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Sea Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
COM/EW Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Regional Communications Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for analysis

Time Processing : Treatment of Randomness : Sidedness :
Static Deterministic, function of an expected value One-sided

Simulation : Model Type :
COM/EW Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Electronic Warfare Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic, Monte Carlo Not Applicable

Simulation :	Model Type :			
<u>COM/EW</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>CRUISE MIS</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Local</u>	<u>Sea States</u>	<u>Not Applicable</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for setup</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>CRUISE MIS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>DAP</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Abstract</u>	<u>Not Applicable</u>	<u>Electronic Warfare</u>	<u>Not Applicable</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>DEWCOM</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Communications</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required, model interruptable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>DEWCOM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Theater</u>	<u>Electronic Warfare</u>	<u>Combined</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>DEWCOM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Reactive</u>		

Simulation :	Model Type :			
<u>ECECE</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Electronic Warfare</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>ECECE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>EMSA</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Abstract</u>	<u>Not Applicable</u>	<u>Electronic Warfare</u>	<u>Combined</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>EMSA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>EWS</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Electronic Warfare</u>	<u>Combined</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>EWS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Meteorological conditions</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Stochastic</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>EWS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Reactive</u>		

Simulation :	Model Type :			
<u>Frequency</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Communications</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Statistical</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>Frequency</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Stochastic, direct computation</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>Frequency</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>Frequency</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>GEMMTLCM</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Air</u>	<u>Element</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, closed form</u>	<u>Deterministic</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>GEMMTLCM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Symmetric</u>	

Simulation :	Model Type :			
<u>IMOM</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Electronic Warfare</u>	<u>Component</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for processes</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Static</u>	<u>Deterministic</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>IMOM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>IMOM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>IPARS</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Air</u>	<u>Element</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, closed form</u>	<u>Deterministic</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>IPARS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>MIDAS</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Regional</u>	<u>Digitized terrain</u>	<u>Combined</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Not Applicable</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>MIDAS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Electronic Warfare</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>NETS</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Terrain</u>	<u>Conceptual</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>NETS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Element</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>REVAM</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Communications</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Static</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>REVAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Electronic Warfare</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>SCARE</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Air</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Deterministic</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>SCARE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>		<u>Asymmetric</u>	

Simulation :	Model Type :			
<u>SCARE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Reactive</u>	

Simulation :	Model Type :			
<u>SOJ</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Meteorological conditions</u>	<u>Not Applicable</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not A</u>	<u>Not Applicable</u>	<u>Required for processes</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Static</u>	<u>Deterministic</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>SOJ</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Symmetric</u>	

Simulation : Model Type :
SPAM Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Individual Earth Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not permitted

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Deterministic Two-sided

Simulation : Model Type :
SPAM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic Asymmetric

Simulation : Model Type :
SPAM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation : Model Type :
STAIR Analysis, research and evaluation tool

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Local Air Element Elec. combat/warfare

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not permitted

Time Processing : Treatment of Randomness : Sidedness :
Dynamic Deterministic Two-sided

Simulation : Model Type :
STAIR Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Symmetric

Simulation : Model Type :
STAIR Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
STEWS Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Local Land Not Applicable Elec. combat/warfare

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Deterministic Two-sided

Simulation : Model Type :
STEWS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Regional Sea Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic Asymmetric

Simulation : Model Type :
STEWS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable One side nonreactive (same for reactive)

Simulation : Model Type :
STEWS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Symmetric

Simulation : Model Type :
TFMS Analysis, research and evaluation tool

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Regional Cultural features Element Elec. combat/warfare

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions and processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic One-sided

Simulation : Model Type :
TFMS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Terrain Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Not Applicable Not Applicable

Simulation :	Model Type :			
<u>TFMS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weathe</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>G2WS</u>	<u>Training and education, skills development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Communications</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, direct computation</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>G2WS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Day and night</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>G2WS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Digitized terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>G2WS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>ICM</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Air</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>ICM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Land</u>	<u>Not Applicable</u>	<u>Unconventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>ICM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>			

Simulation :	Model Type :			
<u>SPAN</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Communications</u>	<u>Combined</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Static</u>	<u>Deterministic</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>SPAN</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Electronic Warfare</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>ACAAM</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Cultural features</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>ACAAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Global</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Reactive</u>	

Simulation : Model Type :
Agile Training and education, exercise driver

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Day and night Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions and processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Deterministic Two-sided

Simulation : Model Type :
Agile Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Terrain Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Asymmetric

Simulation : Model Type :
Agile Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
ALB-XMOD Analysis, research and evaluation tool dealing with combat development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Battlefield Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic, function of an expected value Two-sided

Simulation :	Model Type :			
<u>ALB-XMOD</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>ALB-XMOD</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>ALB-XMOD</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Trafficability</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>ALB-XMOD</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Urban</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
ASESS Analysis, operation support tool (decision aid)

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Air Component Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic, function of an expected value wo-sided

Simulation : Model Type :
ASESS Training and education, exercise driver

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Night Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Asymmetric

Simulation : Model Type :
ASESS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Naval Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation : Model Type :
ATTACK Mod Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Day and night Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions and processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic One-sided

Simulation :	Model Type :			
<u>ATTACK Mod</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Seasons</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>ATTACK Mod</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>AURA</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Weather</u>	<u>Element</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>AURA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Combined</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>AURA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>AURA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>Automated</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Geogra</u>	<u>Terrain</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>	_____		

Simulation :	Model Type :			
<u>Automated</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Vegetation</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
AWSIMS Training and education, exercise driver

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Cultural features Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Stochastic Three-sided

Simulation : Model Type :
AWSIMS Training and education, skills development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Day and night Joint Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Symmetric

Simulation : Model Type :
AWSIMS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Naval Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation : Model Type :
BBS (COMBA) Training

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Digitized terrain Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions and processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Stochastic Two-sided

Simulation : Model Type :
BBS (COMBA) Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Forestation Joint Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Asymmetric

Simulation : Model Type :
BBS (COMBA) Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Meteorological conditions Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation : Model Type :
BPS Training and education, skills development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Regional Barrier Component Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Deterministic Two-sided

Simulation : Model Type :
BPS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Cultural features Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic, direct computation Symmetric

Simulation : Model Type :
BPS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Digitized terrain Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic, Monte Carlo Not Applicable

Simulation : Model Type :
BPS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Vegetation Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
BPS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
Combat Mod Analysis, research and evaluation tool dealing with combat development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Local Terrain Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions

Time Processing : Treatment of Randomness : Sidedness :
Dynamic Deterministic Two-sided

Simulation :	Model Type :			
<u>Combat Mod</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Stochastic</u>		<u>Symmetric</u>	

Simulation :	Model Type :			
<u>COMMANDER</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Barrier</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Stochastic</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>COMMANDER</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Day and night</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Deterministic</u>		<u>Symmetric</u>	

Simulation :	Model Type :			
<u>COMMANDER</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>COMMANDER</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>ConMod</u>	<u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Cultural features</u>	<u>Combined</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>ConMod</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Sector</u>	<u>Day and night</u>	<u>Joint</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>ConMod</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Digitized terrain</u>	<u>Not Applicable</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
ConMod Training and education, exercise driver

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Meteorological conditions Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
ConMod Training and education, skills development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
Correlatio Analysis, research and evaluation tool dealing with combat development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Local Not Applicable Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for setup

Time Processing : Treatment of Randomness : Sidedness :
Static Deterministic Two-sided

Simulation : Model Type :
Correlatio Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Regional Not Applicable Not Applicable Nuclear

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation :	Model Type :			
<u>Correlatio</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Theater</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>DIVLEV</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Theater</u>	<u>Barrier</u>	<u>Combined</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>N</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>DIVLEV</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Day and night</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>DIVLEV</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>DIVLEV</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Urban</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>DIVLEV</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Vegetation</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>DIVLEV</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>Fast Stick</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Day and night</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>Fast Stick</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>FLAPS</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Day and night</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>FLAPS</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Theater</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>			
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>FLAPS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
FOF Training and education, exercise driver

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Theater Transportation factors Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required, model interruptable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Stochastic, Monte Carlo Two-sided

Simulation : Model Type :
FOF Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Joint Rear area

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Asymmetric

Simulation : Model Type :
FOF Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation : Model Type :
FORGE-FORC Education

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Day and night Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required, model interruptable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Deterministic Two-sided

Simulation :	Model Type :			
	<u>FORGE-FORC</u> <u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
	<u>FORGE-FORC</u> <u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Transportation factors</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>GRWSIM</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Day and night</u>	<u>Combined</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>GRWSIM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Hex-based</u>	<u>Joint</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>	<u>Symmetric</u>		

Simulation : Model Type :
GRWSIM | Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable | Not Applicable | Weather | Not Applicable | Nuclear

Mission Area : Level of Detail : Construction :
Not Applicable | Not Applicable | Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable | Not Applicable | Reactive

Simulation : Model Type :
GRWSIM | Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable | Not Applicable | Terrain | Not Applicable | Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable | Not Applicable | Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable | Not Applicable | Not Applicable

Simulation : Model Type :
GRWSIM | Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable | Not Applicable | Transportation factors | Not Applicable | Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable | Not Applicable | Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable | Not Applicable | Not Applicable

Simulation : Model Type :
GRWSIM | Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable | Not Applicable | Barrier | Not Applicable | Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable | Not Applicable | Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable | Not Applicable | Not Applicable

Simulation :	Model Type :			
<u>HELSCAM</u>	<u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Digitized terrain</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>HELSCAM</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Meteorological conditions</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Symmetric</u>	

Simulation :	Model Type :			
<u>JAGUAR</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Day and night</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for processes</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Deterministic</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>JAGUAR</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for analysis</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>		<u>Not Applicable</u>	

Simulation : Model Type :
JAWS (J-8) Analysis, research and evaluation tool dealing with force capability and requirements

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Regional Air Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic, function of expected value Two-sided

Simulation : Model Type :
JAWS (J-8) Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Global Land Joint Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Not Applicable Symmetric

Simulation : Model Type :
JAWS (J-8) Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Sea Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
JAWS (NDU) Training and education, exercise driver

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Barrier Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions and processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Deterministic Two-sided

Simulation :	Model Type :			
JAWS (NDU)	Not Applicable			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
Land	Not Applicable	Day and night	Joint	Not Applicable
Mission Area :	Level of Detail :	Construction :		
Not Applicable	Not Applicable	Not Applicable		
Time Processing :	Treatment of Randomness :	Sidedness :		
Not Applicable	Stochastic, Monte Carlo	Asymmetric		

Simulation :	Model Type :			
JAWS (NDU)	Not Applicable			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
Sea	Not Applicable	Weather	Not Applicable	Not Applicable
Mission Area :	Level of Detail :	Construction :		
Not Applicable	Not Applicable	Not Applicable		
Time Processing :	Treatment of Randomness :	Sidedness :		
Not Applicable	Not Applicable	Reactive		

Simulation :	Model Type :			
JAWS (NDU)	Not Applicable			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
Not Applicable	Not Applicable	Hex-based	Not Applicable	Not Applicable
Mission Area :	Level of Detail :	Construction :		
Not Applicable	Not Applicable	Not Applicable		
Time Processing :	Treatment of Randomness :	Sidedness :		
Not Applicable	Not Applicable	Not Applicable		

Simulation :	Model Type :			
JAWS (NDU)	Not Applicable			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
Not Applicable	Not Applicable	Terrain	Not Applicable	Not Applicable
Mission Area :	Level of Detail :	Construction :		
Not Applicable	Not Applicable	Not Applicable		
Time Processing :	Treatment of Randomness :	Sidedness :		
Not Applicable	Not Applicable	Not Applicable		

Simulation :	Model Type :			
<u>JAWS (NDU)</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Transportation factors</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JESS</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Barrier</u>	<u>Combined</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Not Applicable</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>JESS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Theater</u>	<u>Hex-based</u>	<u>Joint</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>JESS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Time of day</u>	<u>Not Applicable</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JESS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Transportation factors</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JESS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Urban</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JESS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Vegetation</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JESS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
JTLS Analysis, operation support tool (decision aid)

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Barrier Combined Chemical

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions and processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic Two-sided

Simulation : Model Type :
JTLS Analysis, research and evaluation tool dealing with force capability and requirements

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Hex-based Joint Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic, direct computation Asymmetric

Simulation : Model Type :
JTLS Training and education, exercise driver

Domain : Span : Environment : Force Composition : Scope of Conflict :
Naval Not Applicable Time of day Not Applicable Nuclear

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic, Monte Carlo Reactive

Simulation : Model Type :
JTLS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Trafficability Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation :	Model Type :			
<u>JTLS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>MACRO</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Day and night</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>MACRO</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>MACRO-2</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Not Applicable</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>MACRO-2</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>MACRO-2</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Reactive</u>		

Simulation :	Model Type :			
<u>QJM</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Sector</u>	<u>Day and night</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>QJM</u>	<u>Training</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Seasons</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>QJM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>QJM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SOTACA</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>User Specified</u>	<u>Global</u>	<u>Battlefield</u>	<u>Any Mix</u>	<u>Biological</u>
Mission Area :	Level of Detail :	Construction :		
<u>N</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>SOTACA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Individual</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>SOTACA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Local</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SOTACA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Regional</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SOTACA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Theater</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Political</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SOTACA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Rear area</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
SOTACA Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Special

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
Soviet Tro Training and education, skills development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Geographic area Air Joint Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions and processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic One-sided

Simulation : Model Type :
Soviet Tro Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Land Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
SPEED84 Analysis, research and evaluation tool dealing with force capability and requirements

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Regional Air Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not permitted

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Stochastic, Monte Carlo Two-sided

Simulation :	Model Type :			
<u>SPEED84</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>SPEED84</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>One side nonreactive (same for reactive)</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Electronic Warfare</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Component</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for analysis</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Combo</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SWATEM</u>	<u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Day and night</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation : Model Type :
SWATEM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Local Terrain Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Symmetric

Simulation : Model Type :
SWATEM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
TACWAR Analysis, operation support tool (decision aid)

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Air Combined Chemical

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Deterministic Two-sided

Simulation : Model Type :
TACWAR Analysis, research and evaluation tool

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Land Joint Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Asymmetric

Simulation : Model Type :
TACWAR Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Terrain Not Applicable Nuclear

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation : Model Type :
TAC WEAPON Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Local Air Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Static Deterministic One-sided

Simulation : Model Type :
TAC WEAPON Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Earth Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
VECTOR-3 Analysis, research and evaluation tool dealing with combat development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Barrier Combined Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic, function of an expected value Two-sided

Simulation : Model Type :
VECTOR-3 Analysis, research and evaluation tool dealing with force capability and requirements

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Battlefield Joint Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Not Applicable Symmetric

Simulation : Model Type :
VECTOR-3 Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Transportation factors Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
VECTOR-3 Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Trafficability Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
VECTOR-3 Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation :	Model Type :			
<u>ADB (Aircr)</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>ADB (Attri)</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Day and night</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>ADB (Attri)</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>ADB (Attri)</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Nonreactive</u>		

Simulation :	Model Type :			
<u>ADTAM</u>	<u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Global</u>	<u>Air</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for setup</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>ADTAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>AIRRAD</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Deterministic</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>AIRRAD</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation : Model Type :
ALEX Analysis

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions

Time Processing : Treatment of Randomness : Sidedness :
Static Deterministic Not Applicable

Simulation : Model Type :
ATTACK Mod Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Day and night Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions and processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic One-sided

Simulation : Model Type :
ATTACK Mod Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Seasons Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Not Applicable Not Applicable

Simulation : Model Type :
ATTACK Mod Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation :	Model Type :			
<u>CCBM</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Air</u>	<u>Element</u>	<u>Any</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, closed form</u>	<u>Stochastic, direct computation</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>CCBM</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>CCBM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>Error Anal</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Abstract</u>	<u>Local</u>	<u>Not Applicable</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Stochastic, direct computation</u>	<u>One-sided</u>		

Simulation : Model Type :
Error Anal Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Element Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
Fast Stick Training and education, exercise driver

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Local Day and night Component Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions and processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Stochastic, Monte Carlo Two-sided

Simulation : Model Type :
Fast Stick Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Not Applicable Asymmetric

Simulation : Model Type :
ITAM Analysis, research and evaluation tool dealing with combat development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Global Air Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for setup

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic One-sided

Simulation : <u>LABS</u>	Model Type : <u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain : <u>Air</u>	Span : <u>Local</u>	Environment : <u>Air</u>	Force Composition : <u>Element</u>	Scope of Conflict : <u>Conventional</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Required for decisions</u>		
Time Processing : <u>Dynamic, time-step</u>	Treatment of Randomness : <u>Deterministic, function of an expected value</u>	Sidedness : <u>Two-sided</u>		

Simulation : <u>LABS</u>	Model Type : <u>Not Applicable</u>			
Domain : <u>Not Applicable</u>	Span : <u>Not Applicable</u>	Environment : <u>Electronic Warfare</u>	Force Composition : <u>Not Applicable</u>	Scope of Conflict : <u>Not Applicable</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Not Applicable</u>		
Time Processing : <u>Not Applicable</u>	Treatment of Randomness : <u>Stochastic, Monte Carlo</u>	Sidedness : <u>Asymmetric</u>		

Simulation : <u>LABS</u>	Model Type : <u>Not Applicable</u>			
Domain : <u>Not Applicable</u>	Span : <u>Not Applicable</u>	Environment : <u>Meteorological conditions</u>	Force Composition : <u>Not Applicable</u>	Scope of Conflict : <u>Not Applicable</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Not Applicable</u>		
Time Processing : <u>Not Applicable</u>	Treatment of Randomness : <u>Not Applicable</u>	Sidedness : <u>Reactive</u>		

Simulation : <u>MARGI-TAC</u>	Model Type : <u>Analysis, operation support tool (decision aid)</u>			
Domain : <u>Air</u>	Span : <u>Inratheater</u>	Environment : <u>Air</u>	Force Composition : <u>Combined</u>	Scope of Conflict : <u>Strategic</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Required for decisions and processes</u>		
Time Processing : <u>Dynamic, event-step</u>	Treatment of Randomness : <u>Deterministic, function of an expected value</u>	Sidedness : <u>One-sided</u>		

Simulation :	Model Type :			
<u>MARGI-TAC</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>SPEED84</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Air</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>SPEED84</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Asymmetric</u>	

Simulation :	Model Type :			
<u>SPEED84</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>One side nonreactive (same for reactive)</u>	

Simulation : Model Type :
TAC SABER Analysis

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Battlefield Not Applicable Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for input

Time Processing : Treatment of Randomness : Sidedness :
Static Deterministic One-sided

Simulation : Model Type :
TAC SABER Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
TAC SABER Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
TAC SELECT Analysis, research and evaluation tool dealing with combat development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Battlefield Not Applicable Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for input

Time Processing : Treatment of Randomness : Sidedness :
Static Deterministic One-sided

Simulation :	Model Type :			
<u>TAC SELECT</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>TAC SELECT</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>TAC Thunde</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Day and night</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required, model interruptable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>TAC Thunde</u>	<u>Education</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Stochastic</u>	<u>Reactive</u>		

Simulation :	Model Type :			
<u>TAC Thunde</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Trafficability</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>TAC Thunde</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>TALCCM</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Air</u>	<u>Element</u>	<u>Special</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for setup</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>TALCCM</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Meteorological conditions</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
TEM Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Individual Terrain Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, closed form Deterministic One-sided

Simulation : Model Type :
TEM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Local Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
TEM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
TFDTAM Analysis, research and evaluation tool dealing with force capability and requirements

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Global Air Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for setup

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Deterministic One-sided

Simulation :	Model Type :			
<u>TFDTAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Meteorological conditions</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>Visual Sea</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Air</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>ARTOAR</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Air</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>ARTOAR</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>ARTOAR</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Nonreactive</u>		

Simulation :	Model Type :			
<u>BETA</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Not Applicable</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>BETA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>	<u>Nonreactive</u>		

Simulation :	Model Type :			
<u>BETA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>ADTAM</u>	<u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Global</u>	<u>Air</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for setup</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>ADTAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>AASPEM</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Air</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Stochastic, direct computation</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>AASPEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Asymmetric</u>	

Simulation :	Model Type :			
<u>AASPEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Reactive</u>		

Simulation :	Model Type :			
<u>ADTAM</u>	<u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Global</u>	<u>Air</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for setup</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>ADTAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>Balboa</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Air</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>Balboa</u>	<u>Training and education, skills development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Land</u>	<u>Not Applicable</u>	<u>Rear area</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>RED side nonreactive (same for BLUE side)</u>	

Simulation :	Model Type :			
<u>TAC Brawle</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Air</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>TAC Brawle</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Earth</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Asymmetric</u>	

Simulation :	Model Type :			
<u>TAC Brawle</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Reactive</u>	

Simulation :	Model Type :			
<u>Fast Stick</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Day and night</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>Fast Stick</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Not Applicable</u>		<u>Asymmetric</u>	

Simulation :	Model Type :			
<u>RECCE</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Global</u>	<u>Air</u>	<u>Combined</u>	<u>Elec. combat/warfare</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Static</u>	<u>Deterministic</u>		<u>Three-sided</u>	

Simulation :	Model Type :			
<u>RECCE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Local</u>	<u>Cultural features</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation : Model Type :
RECCE Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Regional Digitized terrain Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
MULTI-ASP Analysis, research and evaluation tool dealing with combat development

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Regional Air Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for input

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Stochastic, Monte Carlo Two-sided

Simulation : Model Type :
MULTI-ASP Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Asymmetric

Simulation : Model Type :
MULTI-ASP Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation :	Model Type :			
<u>ABATAK</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Airbase</u>	<u>Local</u>	<u>Time of day</u>	<u>Airbase</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required, model interruptable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>ABATAK</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>ABATAK</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>CBAM</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Air</u>	<u>Element</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Deterministic, function of an expected value</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>CBAM</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Airbase</u>	<u>Not Applicable</u>	<u>Land</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>CBAM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>One side nonreactive (same for reactive)</u>		

Simulation :	Model Type :			
<u>ORDAM</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>AB</u>	<u>AB</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>TSAR</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Day and night</u>	<u>Airbase</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>TSAR</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Geography</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>TSAR</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Meteorological conditions</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>TSAR</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Time of day</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>TSARINA</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Geography</u>	<u>Element</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>TSARINA</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Meteorological conditions</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>ACE</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Global</u>	<u>Air</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Deterministic</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>ACE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Theater</u>	<u>Geography</u>	<u>Joint</u>	<u>Strategic</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>ACE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Reactive</u>		

Simulation :	Model Type :			
<u>ASUMS</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Not Applicable</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, direct computation</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>ASUMS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>BEST WEAPO</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Day and night</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic, generates value as a function of time</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>BEST WEAPO</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Time of day</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
BEST WEAPO Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
BETA Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Individual Not Applicable Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not permitted

Time Processing : Treatment of Randomness : Sidedness :
Dynamic Deterministic Two-sided

Simulation : Model Type :
BETA Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic, Monte Carlo Nonreactive

Simulation : Model Type :
BETA Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : <u>CISCIAD</u>	Model Type : <u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain : <u>Air</u>	Span : <u>Regional</u>	Environment : <u>Digitized terrain</u>	Force Composition : <u>Not Applicable</u>	Scope of Conflict : <u>Conventional</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Not permitted</u>		
Time Processing : <u>Dynamic, event-step</u>	Treatment of Randomness : <u>Stochastic, Monte Carlo</u>	Sidedness : <u>Two-sided</u>		

Simulation : <u>CISCIAD</u>	Model Type : <u>Not Applicable</u>			
Domain : <u>Land</u>	Span : <u>Not Applicable</u>	Environment : <u>Time of day</u>	Force Composition : <u>Not Applicable</u>	Scope of Conflict : <u>Not Applicable</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Not Applicable</u>		
Time Processing : <u>Not Applicable</u>	Treatment of Randomness : <u>Not Applicable</u>	Sidedness : <u>Asymmetric</u>		

Simulation : <u>CISCIAD</u>	Model Type : <u>Not Applicable</u>			
Domain : <u>Not Applicable</u>	Span : <u>Not Applicable</u>	Environment : <u>Vegetation</u>	Force Composition : <u>Not Applicable</u>	Scope of Conflict : <u>Not Applicable</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Not Applicable</u>		
Time Processing : <u>Not Applicable</u>	Treatment of Randomness : <u>Not Applicable</u>	Sidedness : <u>RED side nonreactive (same for BLUE side)</u>		

Simulation : <u>CISCIAD</u>	Model Type : <u>Not Applicable</u>			
Domain : <u>Not Applicable</u>	Span : <u>Not Applicable</u>	Environment : <u>Weather</u>	Force Composition : <u>Not Applicable</u>	Scope of Conflict : <u>Not Applicable</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Not Applicable</u>		
Time Processing : <u>Not Applicable</u>	Treatment of Randomness : <u>Not Applicable</u>	Sidedness : <u>Not Applicable</u>		

Simulation :	Model Type :			
<u>COMO III</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Digitized terrain</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, direct computation</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>COMO III</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Theater</u>	<u>Electronic Warfare</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>COMO III</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Meteorological conditions</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>One side nonreactive (same for reactive)</u>		

Simulation :	Model Type :			
<u>COMO(T)</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Electronic Warfare</u>	<u>Component</u>	<u>Chemical</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation : Model Type :
COMO(T) Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Theater Time of day Not Applicable Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Not Applicable Symmetric

Simulation : Model Type :
COMO(T) Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Naval Not Applicable Terrain Not Applicable Nuclear

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
COMO(T) Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
End-Game Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Individual Air Not Applicable Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Static Deterministic Two-sided

Simulation :	Model Type :			
<u>Engage</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Terrain</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for setup</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Static</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>Engage</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>ESAMS</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Terrain</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>ESAMS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>Fast Stick</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Day and night</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>Fast Stick</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>GUNFIRE</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Not Applicable</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, closed form</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>GUNFIRE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>HOME</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Electronic Warfare</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>HOME</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>IRPD</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Air</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, closed form</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>IRPD</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>MABS-EX</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Air</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>MABS-EX</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Regional</u>	<u>Earth</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>MABS-EX</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>One side nonreactive (same for reactive)</u>		

Simulation :	Model Type :			
<u>MPRES</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Earth</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation : Model Type :
MPRES Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Regional Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
NADM Analysis, research and evaluation tool dealing with force capability and requirements

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Global Earth Any Mix Strategic

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for analysis

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Stochastic, Monte Carlo Two-sided

Simulation : Model Type :
NADM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable One side nonreactive (same for reactive)

Simulation : Model Type :
NADM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation :	Model Type :			
<u>NADM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>P001</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Inogvidual</u>	<u>Terrain</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>P001</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>PASTE</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Cultural features</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic, function of an expected value</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>PASTE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Sea States</u>	<u>Not Applicable</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Stochastic, direct computation</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>PASTE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Stochastic, Monte Carlo</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>PIVADS</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Air</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>PIVADS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Earth</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>RADGUNS</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>		<u>Land</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>RADGUNS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>RADGUNS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SAAMBO</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Air</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, closed form</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation : Model Type :
SAAMBO Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Local Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
SPAM Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Individual Earth Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not permitted

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Deterministic Two-sided

Simulation : Model Type :
SPAM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic Asymmetric

Simulation : Model Type :
SPAM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Electronic Warfare</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Component</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for analysis</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : <u>SPIRITS</u>	Model Type : <u>Not Applicable</u>			
Domain : <u>Combo</u>	Span : <u>Not Applicable</u>	Environment : <u>Not Applicable</u>	Force Composition : <u>Not Applicable</u>	Scope of Conflict : <u>Not Applicable</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Not Applicable</u>		
Time Processing : <u>Not Applicable</u>	Treatment of Randomness : <u>Not Applicable</u>	Sidedness : <u>Not Applicable</u>		

Simulation : <u>SUPPRESSOR</u>	Model Type : <u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain : <u>Air</u>	Span : <u>Regional</u>	Environment : <u>Air</u>	Force Composition : <u>Any Mix</u>	Scope of Conflict : <u>Conventional</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Not required</u>		
Time Processing : <u>Dynamic, event-step</u>	Treatment of Randomness : <u>Deterministic</u>	Sidedness : <u>User Specified</u>		

Simulation : <u>SUPPRESSOR</u>	Model Type : <u>Not Applicable</u>			
Domain : <u>Land</u>	Span : <u>Not Applicable</u>	Environment : <u>Terrain</u>	Force Composition : <u>Not Applicable</u>	Scope of Conflict : <u>Not Applicable</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Not Applicable</u>		
Time Processing : <u>Not Applicable</u>	Treatment of Randomness : <u>Stochastic</u>	Sidedness : <u>Not Applicable</u>		

Simulation : <u>SUPPRESSOR</u>	Model Type : <u>Not Applicable</u>			
Domain : <u>Naval</u>	Span : <u>Not Applicable</u>	Environment : <u>Not Applicable</u>	Force Composition : <u>Not Applicable</u>	Scope of Conflict : <u>Not Applicable</u>
Mission Area : <u>Not Applicable</u>	Level of Detail : <u>Not Applicable</u>	Construction : <u>Not Applicable</u>		
Time Processing : <u>Not Applicable</u>	Treatment of Randomness : <u>Not Applicable</u>	Sidedness : <u>Not Applicable</u>		

Simulation :	Model Type :			
<u>TACEM</u>	<u>Analysis, research and evaluation tool</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Day and night</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>TACEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Asymmetric</u>	

Simulation :	Model Type :			
<u>TACEM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Reactive</u>	

Simulation :	Model Type :			
<u>TAC REPELL</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Day and night</u>	<u>Component</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	

Simulation : Model Type :
TAC REPELL Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Terrain Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Asymmetric

Simulation : Model Type :
TAC REPELL Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation : Model Type :
TACWARS Analysis

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Regional Battlefield Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic Deterministic One-sided

Simulation : Model Type :
TACWARS Training and education

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Digitized terrain Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic, Monte Carlo Symmetric

Simulation : Model Type :
TACWARS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Geography Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Reactive

Simulation : Model Type :
TOTAL ROUN Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Regional Air Not Applicable Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for setup

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Stochastic, Monte Carlo Two-sided

Simulation : Model Type :
TOTAL ROUN Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Sea Not Applicable Day and night Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
TRICIA Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Air Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required for decisions and processes

Time Processing : Treatment of Randomness : Sidedness :
Dynamic Deterministic One-sided

Simulation :	Model Type :			
<u>TRICIA</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Day and night</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>UVWR</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Weather</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not required</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Static</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>UVWR</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Local</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>VEDER</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Air</u>	<u>Element</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>VEDER</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>GIFT</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>GIFT</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Stochastic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>GIFT</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JANUS/R</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Digitized terrain</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>JANUS/R</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Time of day</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Symmetric</u>	

Simulation :	Model Type :			
<u>JANUS/R</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>JANUS/R</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Electronic Warfare</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Component</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for analysis</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Combo</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>VAST</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Abstract</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>GIFT</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>GIFT</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Stochastic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>GIFT</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>JANUS/R</u>	<u>Analysis, research and evaluation tool dealing with force capability and requirements</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Local</u>	<u>Digitized terrain</u>	<u>Element</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Two-sided</u>		

Simulation :	Model Type :			
<u>JANUS/R</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Time of day</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Symmetric</u>		

Simulation :	Model Type :			
<u>JANUS/R</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
JANUS/R Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
MATADOR Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Local Not Applicable Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not permitted

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, closed form Stochastic Two-sided

Simulation : Model Type :
MATADOR Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Symmetric

Simulation : Model Type :
SLAVE Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Local Air Element Elec. combat/warfare

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Static Deterministic Two-sided

Simulation :	Model Type :			
<u>SLAVE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Asymmetric</u>		

Simulation :	Model Type :			
<u>SLAVE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SLAVE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Analysis</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Electronic Warfare</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Component</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for analysis</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>SPIRITS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Combo</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
STOCHADE Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Abstract Local Not Applicable Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Deterministic Two-sided

Simulation : Model Type :
STOCHADE Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Regional Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Stochastic Symmetric

Simulation : Model Type :
TANK WARS Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Local Battlefield Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not permitted

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step Stochastic, Monte Carlo Two-sided

Simulation : Model Type :
TANK WARS Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable Not Applicable Not Applicable Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Asymmetric

Simulation :	Model Type :			
<u>TANK WARS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Reactive</u>		

Simulation :	Model Type :			
<u>VAST</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Abstract</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>WEIGHT</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for input</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>WEIGHT</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>CISCIAD</u>	<u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Regional</u>	<u>Digitized terrain</u>	<u>Not Applicable</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	
Simulation :	Model Type :			
<u>CISCIAD</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Time of day</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Asymmetric</u>	
Simulation :	Model Type :			
<u>CISCIAD</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Vegetation</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>RED side nonreactive (same for BLUE side)</u>	
Simulation :	Model Type :			
<u>CISCIAD</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>ALWSIM III</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Sector</u>	<u>Land</u>	<u>Component</u>	<u>Laser</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>ALWSIM III</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>BLUEMAX II</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Individual</u>	<u>Terrain</u>	<u>Element</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, closed form</u>	<u>Deterministic</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>CFARC</u>	<u>Analysis, research and evaluation tool dealing with weapon systems</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Global</u>	<u>Electronic Warfare</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Stochastic, Monte Carlo</u>		<u>One-sided</u>	

Simulation :	Model Type :			
<u>CFARC</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>CFARC</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>DETCONT</u>	<u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Regional</u>	<u>Day and night</u>	<u>Element</u>	<u>Detection</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Static</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>DETCONT</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>DETCONT</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Not Applicable</u>	

Simulation :	Model Type :			
<u>Eagle</u>	<u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Terrain</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Required for decisions and processes</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Dynamic, time-step</u>	<u>Deterministic</u>		<u>Two-sided</u>	

Simulation :	Model Type :			
<u>Eagle</u>	<u>Training and education, exercise driver</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Joint</u>	<u>Nuclear</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Symmetric</u>	

Simulation :	Model Type :			
<u>Eagle</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :		Sidedness :	
<u>Not Applicable</u>	<u>Not Applicable</u>		<u>Reactive</u>	

Simulation : Model Type :
EDECSIM : Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air : Local : Cultural features : Conceptual : Conventional

Mission Area : Level of Detail : Construction :
Not Applicable : Not Applicable : Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, event-step : Stochastic, Monte Carlo : Two-sided

Simulation : Model Type :
EDECSIM : Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land : Not Applicable : Meteorological conditions : Not Applicable : Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable : Not Applicable : Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable : Not Applicable : Not Applicable

Simulation : Model Type :
EDECSIM : Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable : Not Applicable : Terrain : Not Applicable : Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable : Not Applicable : Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable : Not Applicable : Not Applicable

Simulation : Model Type :
EDECSIM : Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Not Applicable : Not Applicable : Vegetation : Not Applicable : Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable : Not Applicable : Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable : Not Applicable : Not Applicable

Simulation : Model Type :
EOVAC Analysis, research and evaluation tool

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Theater Battlefield Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Required

Time Processing : Treatment of Randomness : Sidedness :
Static Stochastic, direct computation Two-sided

Simulation : Model Type :
EOVAC Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Day and night Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Stochastic, Monte Carlo Reactive

Simulation : Model Type :
GEMM Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Local Air Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not permitted

Time Processing : Treatment of Randomness : Sidedness :
Dynamic, time-step Stochastic, Monte Carlo Two-sided

Simulation : Model Type :
GEMM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Land Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Asymmetric

Simulation :	Model Type :			
<u>GEMM</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Sea</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Reactive</u>		

Simulation :	Model Type :			
<u>IEW</u>	<u>Analysis, operation support tool (decision aid)</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Air</u>	<u>Theater</u>	<u>Land</u>	<u>Combined</u>	<u>Conventional</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, closed form</u>	<u>Deterministic</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>IEW</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Not Applicable</u>	<u>Time of day</u>	<u>Joint</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, event-step</u>	<u>Stochastic, Monte Carlo</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>IEW</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Naval</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>IEW</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Space</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>OBSERVE</u>	<u>Analysis, research and evaluation tool dealing with combat development</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Regional</u>	<u>Day and night</u>	<u>Element</u>	<u>Detection</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not permitted</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Dynamic, time-step</u>	<u>Deterministic</u>	<u>One-sided</u>		

Simulation :	Model Type :			
<u>OBSERVE</u>	<u>Training and education, skills developm</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Terrain</u>	<u>Not Applicable</u>	<u>Laser</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation :	Model Type :			
<u>OBSERVE</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Weather</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

Simulation : Model Type :
TAC RANGER Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Individual Not Applicable Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Dynamic Deterministic One-sided

Simulation : Model Type :
TAPM Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Regional Terrain Component Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Dynamic Deterministic Not Applicable

Simulation : Model Type :
TAPM Not Applicable

Domain : Span : Environment : Force Composition : Scope of Conflict :
Land Not Applicable Weather Not Applicable Not Applicable

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not Applicable

Time Processing : Treatment of Randomness : Sidedness :
Not Applicable Not Applicable Not Applicable

Simulation : Model Type :
TIS Analysis, research and evaluation tool dealing with weapon systems

Domain : Span : Environment : Force Composition : Scope of Conflict :
Air Individual Weather Element Conventional

Mission Area : Level of Detail : Construction :
Not Applicable Not Applicable Not required

Time Processing : Treatment of Randomness : Sidedness :
Static Deterministic One-sided

Simulation :	Model Type :			
<u>TIS</u>	<u>Not Applicable</u>			
Domain :	Span :	Environment :	Force Composition :	Scope of Conflict :
<u>Land</u>	<u>Local</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Mission Area :	Level of Detail :	Construction :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		
Time Processing :	Treatment of Randomness :	Sidedness :		
<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>		

***MISSION
OF
ROME LABORATORY***

Mission. The mission of Rome Laboratory is to advance the science and technologies of command, control, communications and intelligence and to transition them into systems to meet customer needs. To achieve this, Rome Lab:

- a. Conducts vigorous research, development and test programs in all applicable technologies;
- b. Transitions technology to current and future systems to improve operational capability, readiness, and supportability;
- c. Provides a full range of technical support to Air Force Materiel Command product centers and other Air Force organizations;
- d. Promotes transfer of technology to the private sector;
- e. Maintains leading edge technological expertise in the areas of surveillance, communications, command and control, intelligence, reliability science, electro-magnetic technology, photonics, signal processing, and computational science.

The thrust areas of technical competence include: Surveillance, Communications, Command and Control, Intelligence, Signal Processing, Computer Science and Technology, Electromagnetic Technology, Photonics and Reliability Sciences.