

AD 743918

AD _____

BDRL

TECHNICAL MEMORANDUM
BDRL-TM-72-002

APPROXIMATIONS OF DOWNWIND DISTANCE FOR A
GIVEN THREAT FROM AN ELEVATED LINE SOURCE

II. DOMAIN OF INVERSE RELATIONSHIP BETWEEN F_2 AND Z FOR
VALUES OF β BETWEEN .6 AND 1.6 AND VALUES OF T OF 36 OR LESS.

By

Michael J. Evans

June 1972

U. S. ARMY

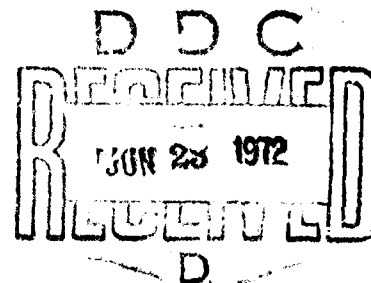
BIOLOGICAL DEFENSE RESEARCH LABORATORY

ANALYTICAL SCIENCES OFFICE

DUGWAY, UTAH 84022

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
U S Department of Commerce
Springfield VA 22151

Distribution Statement



Approved for release to the public; distribution unlimited.

SEE AD 743917

SECRET		WRITE SECTION ☒	
DDC		NOTE SECTION ☐	
GER.		☐	
JUSTIFICATION			
BY			
DISTRIBUTION/AVAILABILITY CODES			
DIST.	AVAIL.	SPECIAL	
A			

DISPOSITION INSTRUCTIONS

DESTROY THIS REPORT WHEN NO LONGER NEEDED
DO NOT RETURN IT TO THE ORIGINATOR

DISCLAIMER

THE FINDINGS IN THIS DOCUMENT ARE NOT TO BE CONSTRUED AS AN OFFICIAL DEPARTMENT OF THE ARMY POSITION UNLESS SO DESIGNATED BY OTHER AUTHORIZED DOCUMENTS. THE USE OF TRADE NAMES IN THIS REPORT DOES NOT CONSTITUTE AN OFFICIAL ENDORSEMENT OR APPROVAL OF THE USE OF SUCH COMMERCIAL HARDWARE OR SOFTWARE THIS REPORT MAY NOT BE CITED FOR PURPOSES OF ADVERTISEMENT.

UNCLASSIFIED
Security Classification

DOCUMENT CONTROL DATA - R & D .

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) Biological Defense Research Laboratory Analytical Sciences Office Dugway, Utah 84022		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	
		2b. GROUP	
3. REPORT TITLE Approximations of Downwind Distance for a Given Threat from an Elevated Line Source. II. Domain of Inverse Relationship Between F_2 and Z for Values of β Between .6 and 1.6 and Values of T of 36 or Less.			
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Technical Memorandum			
5. AUTHOR(S) (First name, middle initial, last name) Michael J. Evans			
6. REPORT DATE June 1972		7a. TOTAL NO. OF PAGES 46	7b. NO. OF REFS 2
8a. CONTRACT OR GRANT NO. A. PROJECT NO. 1B562115AD35		8b. ORIGINATOR'S REPORT NUMBER(S) BDRL-TM-72-002	
c.		9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) BDRL-TM-72-001	
d.			
10. DISTRIBUTION STATEMENT Approved for release to the public; distribution unlimited.			
11. SUPPLEMENTARY NOTES		12. SPONSORING MILITARY ACTIVITY Biological Defense Research Laboratory Analytical Sciences Office Dugway, Utah 84022	
13. ABSTRACT The initial steps previously described for a limited number of values for β are expanded. To determine the downwind distance corresponding to a given casualty level, an intermediate variable Z is determined from parameters β and T. From the variable Z, a second intermediate variable F_2 must also be determined. For situations where β is between .6 and 1.6 and T is 36 or less, the domain of definition of the relationship F_2 has to Z is approximated, i.e., the values of Z that give rise to values of F_2 are determined.			
14. Key words Model Line Source Open End Procedures Casualty Estimates Biological Defense Elevated Line			

DD FORM 1473
NOV 65

REPLACES DD FORM 1473, 1 JAN 66, WHICH IS
OBSOLETE FOR ARMY USE.

III

UNCLASSIFIED
Security Classification

TECHNICAL MEMORANDUM

APPROXIMATIONS OF DOWNWIND DISTANCE FOR A
GIVEN THREAT FROM AN ELEVATED LINE SOURCE

II. DOMAIN OF INVERSE RELATIONSHIP BETWEEN F_2 AND Z FOR
VALUES OF β BETWEEN .5 AND 1.6 AND VALUES OF T OF 36 OR LESS.

by

Michael J. Evans

June 1972

Distribution Statement

Approved for release to the public; distribution unlimited.

U. S. Army
Biological Defense Research Laboratory
Analytical Sciences Office
Dugway, Utah 84022

Project: 1B562115AD35

IV

ABSTRACT

The initial steps previously described for a limited number of values for β are expanded. To determine the downwind distance corresponding to a given casualty level, an intermediate variable Z is determined from parameters β and T . From the variable Z , a second intermediate variable F_2 must also be determined. For situations where β is between .6 and 1.6 and T is 36 or less, the domain of definition of the relationship F_2 has to Z is approximated, i.e., the values of Z that give rise to values of F_2 are determined.

TABLE OF CONTENTS

ABSTRACT	v
1. INTRODUCTION	1
2. AN APPROXIMATION FOR THE CASE $.001 \leq T \leq 36$	3
TABLE A. APPROXIMATIONS OF F_{2m} AND Z_{max} AND THEIR RELATIVE ERRORS .	7
TABLE B. SUMMARY OF ACCURACY OF APPROXIMATION OF Z_{max}	29
TABLE C. APPROXIMATIONS OF F_{2m} AND Z_{max} AND THEIR RELATIVE ERRORS .	31
REFERENCES	35
DISTRIBUTION LIST	37

1. INTRODUCTION

In a previous study¹ the problem of finding a method to estimate the downwind distance for a given threat from an elevated line source which would be adaptable to a programmable calculator was discussed. This was called the problem of the "backward" solution. As indicated in the previous study, one of the critical areas is the approximation of the domain of definition of the inverse relationship between F_2 and Z . A method to approximate this domain was given for the situations where T is 30 or less, and $\beta = .833...$ or $\beta = .875$. This was done by approximating $Z_{\max}$, the maximum value that Z can assume for a given β and T .

This same problem has been studied in a much broader sense by allowing β to assume any value between .6 and 1.6, and approximating the domain of definition of the inverse relationship between F_2 and Z by way of approximating $Z_{\max}$. In this report one formula is given, which approximates $Z_{\max}$, given any value of T between .001 and 36, and any value of β between .6 and 1.6. For values of T less than .001, the constant approximation proposed in Section 2 of the previous study¹ is recommended.

¹ See reference 1.

2. AN APPROXIMATION FOR THE CASE $.001 \leq T \leq 36$

Proceeding as in the previous study¹, an approximation, call it $Z_{\max*}$, to $Z_{\max}$ can be made by first finding an approximation, call it F_{2m*} , to F_{2m} , the value of F_2 at which Z assumes its maximum value $Z_{\max}$. Then $Z_{\max*}$ is defined to be

$$Z_{\max*} = F_{2m*} e^{-\beta F_{2m*}} e^{-2\beta F_{2m*}} e^{-TF_{2m*}}$$

Data were assembled in order to find an expression for F_{2m*} (first three columns of Table A). For any particular values of β and T , F_{2m} was determined correct to three decimal places, strictly by examining the values of Z around its maximum, and the corresponding values of F_2 . With these three columns of data, a series of multiple regressions was conducted, attempting to find a formula for an approximation to F_{2m} in terms of β and T . The following formula is the end product of this investigation:

$$\begin{aligned} F_{2m*} = & a_0 + a_1 T^{1/4} + a_2 T^{5/4} + a_3 \frac{1}{T^{1/2}} + a_4 \frac{1}{T^{3/4}} + a_5 \frac{1}{T^{5/4}} + a_6 \frac{1}{\beta T^{1/4}} \\ & + a_7 \frac{1}{\beta T^{1/2}} + a_8 \beta^{1/4} + a_9 \beta^{1/2} \\ & + \sum_{i=0}^7 \sum_{j=0}^3 b_{ij} \beta^j \left[\ln\left(T + \frac{\beta^2 T}{4}\right) \right]^i \end{aligned}$$

where

$$\begin{aligned} a_0 &= -8.42051 \times 10^0 \\ a_1 &= -4.42953 \times 10^{-1} \\ a_2 &= 3.07905 \times 10^{-3} \\ a_3 &= -1.50699 \times 10^{-1} \\ a_4 &= 2.71018 \times 10^{-2} \end{aligned}$$

¹ See reference 1.

$$\begin{aligned}
a_5 &= -1.98197 \times 10^{-5} \\
a_6 &= 6.35919 \times 10^{-1} \\
a_7 &= -7.93436 \times 10^{-2} \\
a_8 &= 1.59644 \times 10^1 \\
a_9 &= -6.54011 \times 10^0 \\
b_{00} &= -6.39818531826 \times 10^{-1} \\
b_{01} &= 1.60668159469 \times 10^0 \\
b_{02} &= -1.29269367557 \times 10^0 \\
b_{03} &= 3.38940935444 \times 10^{-1} \\
b_{10} &= 9.75667625190 \times 10^{-2} \\
b_{11} &= -4.52372554215 \times 10^{-1} \\
b_{12} &= 4.60145889183 \times 10^{-1} \\
b_{13} &= -1.31250714463 \times 10^{-1} \\
b_{20} &= 1.60627896026 \times 10^{-1} \\
b_{21} &= -3.68303780643 \times 10^{-1} \\
b_{22} &= 2.62286078697 \times 10^{-1} \\
b_{23} &= -6.06964525058 \times 10^{-2} \\
b_{30} &= 1.04534994545 \times 10^{-5} \\
b_{31} &= 3.24577100249 \times 10^{-2} \\
b_{32} &= -3.99022673036 \times 10^{-2} \\
b_{33} &= 1.20989616679 \times 10^{-2} \\
b_{40} &= -1.06065905070 \times 10^{-2} \\
b_{41} &= 2.55606661311 \times 10^{-2} \\
b_{42} &= -1.81327433244 \times 10^{-2}
\end{aligned}$$

$$b'_{43} = 4.19578636363 \times 10^{-3}$$

$$b_{50} = -2.66444817568 \times 10^{-4}$$

$$b_{51} = -6.49540010470 \times 10^{-4}$$

$$b_{52} = 1.10844058340 \times 10^{-3}$$

$$b_{53} = -3.66718975653 \times 10^{-4}$$

$$b_{60} = 2.73250116167 \times 10^{-4}$$

$$b_{61} = -7.67150044510 \times 10^{-4}$$

$$b_{62} = 5.80376870276 \times 10^{-4}$$

$$b_{63} = -1.40798966135 \times 10^{-4}$$

$$b_{70} = 2.07759268633 \times 10^{-5}$$

$$b_{71} = -4.99850768588 \times 10^{-5}$$

$$b_{72} = 3.32047504834 \times 10^{-5}$$

$$b_{73} = -7.27842208300 \times 10^{-6}$$

The accuracy of this approximation is illustrated in Table A. F_{2m} rounded to three decimal places appears in column four. The relative error of this approximation to F_{2m} appears in column five. The Z_{max} and Z_{max*} values found in columns six and seven, respectively, were computed from the rounded figures in columns three and four, respectively, and then rounded to three significant digits. The relative error of the approximation Z_{max*} to Z_{max} appears in the final column, and was computed on the basis of 12 significant digits for Z_{max} and Z_{max*} .

Table B summarizes the accuracy of the approximation in that the second column represents the maximum relative error observed in checking the approximation with the test data (Table A).

As an application of this approximation technique, it was applied to the data available from the previous study¹, namely, $.01 \leq T \leq 30$, $\beta = .833...$, and $\beta_1 = .875$. Table C shows the results of this application. Table C was devised in the same format as Table A. The final column shows that the approximation compares favorably with the approximation established in the previous study¹. The maximum observed relative error in the estimation of Z_{max} is .0161 percent for $\beta = .833...$, and .0252 percent for $\beta = .875$.

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 1

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.6	.001	1.777	1.770	.394%	4.28×10^{-1}	4.28×10^{-1}	.0006%
.6	.002	1.773	1.782	.508%	4.27×10^{-1}	4.27×10^{-1}	.0009%
.6	.003	1.769	1.770	.057%	4.27×10^{-1}	4.27×10^{-1}	.0000%
.6	.004	1.765	1.761	.227%	4.26×10^{-1}	4.26×10^{-1}	.0001%
.6	.006	1.756	1.752	.228%	4.24×10^{-1}	4.24×10^{-1}	.0002%
.6	.008	1.748	1.745	.172%	4.23×10^{-1}	4.23×10^{-1}	.0001%
.6	.010	1.740	1.739	.057%	4.21×10^{-1}	4.21×10^{-1}	.0000%
.6	.015	1.720	1.724	.233%	4.18×10^{-1}	4.18×10^{-1}	.0002%
.6	.020	1.702	1.707	.294%	4.14×10^{-1}	4.14×10^{-1}	.0004%
.6	.025	1.684	1.690	.356%	4.11×10^{-1}	4.11×10^{-1}	.0005%
.6	.030	1.667	1.673	.360%	4.07×10^{-1}	4.07×10^{-1}	.0006%
.6	.035	1.650	1.656	.364%	4.04×10^{-1}	4.04×10^{-1}	.0005%
.6	.040	1.635	1.640	.306%	4.01×10^{-1}	4.01×10^{-1}	.0005%
.6	.045	1.619	1.625	.371%	3.97×10^{-1}	3.97×10^{-1}	.0005%
.6	.050	1.605	1.609	.249%	3.94×10^{-1}	3.94×10^{-1}	.0004%
.6	.055	1.591	1.595	.251%	3.91×10^{-1}	3.91×10^{-1}	.0003%
.6	.060	1.577	1.581	.254%	3.88×10^{-1}	3.88×10^{-1}	.0003%
.6	.065	1.564	1.567	.192%	3.85×10^{-1}	3.85×10^{-1}	.0002%
.6	.070	1.551	1.554	.193%	3.82×10^{-1}	3.82×10^{-1}	.0002%
.6	.075	1.539	1.541	.150%	3.79×10^{-1}	3.79×10^{-1}	.0001%
.6	.080	1.527	1.529	.131%	3.76×10^{-1}	3.76×10^{-1}	.0001%
.6	.085	1.515	1.517	.132%	3.73×10^{-1}	3.73×10^{-1}	.0001%
.6	.090	1.504	1.506	.133%	3.70×10^{-1}	3.70×10^{-1}	.0001%
.6	.095	1.493	1.495	.134%	3.68×10^{-1}	3.68×10^{-1}	.0001%
.6	.100	1.482	1.484	.135%	3.65×10^{-1}	3.65×10^{-1}	.0001%
.6	.150	1.390	1.391	.072%	3.40×10^{-1}	3.40×10^{-1}	.0000%
.6	.200	1.316	1.318	.152%	3.18×10^{-1}	3.18×10^{-1}	.0002%
.6	.250	1.255	1.257	.159%	2.98×10^{-1}	2.98×10^{-1}	.0002%
.6	.300	1.203	1.207	.333%	2.80×10^{-1}	2.80×10^{-1}	.0007%
.6	.350	1.159	1.163	.345%	2.64×10^{-1}	2.64×10^{-1}	.0011%
.6	.400	1.120	1.124	.357%	2.49×10^{-1}	2.49×10^{-1}	.0013%
.6	.450	1.085	1.090	.461%	2.36×10^{-1}	2.35×10^{-1}	.0020%
.6	.500	1.054	1.059	.474%	2.24×10^{-1}	2.24×10^{-1}	.0023%
.6	.550	1.026	1.031	.487%	2.12×10^{-1}	2.12×10^{-1}	.0027%
.6	.600	1.000	1.005	.500%	2.02×10^{-1}	2.02×10^{-1}	.0025%

Preceding page blank

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 2

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.6	.650	.977	.982	.512%	1.92×10^{-1}	1.92×10^{-1}	.0033%
.6	.700	.955	.960	.524%	1.83×10^{-1}	1.83×10^{-1}	.0032%
.6	.750	.935	.940	.535%	1.75×10^{-1}	1.75×10^{-1}	.0035%
.6	.800	.916	.921	.546%	1.67×10^{-1}	1.67×10^{-1}	.0032%
.6	.850	.899	.904	.556%	1.59×10^{-1}	1.59×10^{-1}	.0040%
.6	.900	.882	.887	.567%	1.52×10^{-1}	1.52×10^{-1}	.0032%
.6	.950	.867	.872	.577%	1.46×10^{-1}	1.46×10^{-1}	.0039%
.6	1.000	.853	.857	.469%	1.40×10^{-1}	1.40×10^{-1}	.0032%
.6	1.500	.743	.746	.404%	9.40×10^{-2}	9.40×10^{-2}	.0028%
.6	2.000	.670	.671	.149%	6.61×10^{-2}	6.61×10^{-2}	.0003%
.6	2.500	.617	.617	.000%	4.79×10^{-2}	4.79×10^{-2}	.0000%
.6	3.000	.576	.576	.000%	3.56×10^{-2}	3.56×10^{-2}	.0000%
.6	3.500	.543	.542	.184%	2.69×10^{-2}	2.69×10^{-2}	.0002%
.6	4.000	.515	.514	.194%	2.07×10^{-2}	2.07×10^{-2}	.0011%
.6	4.500	.492	.491	.203%	1.61×10^{-2}	1.61×10^{-2}	.0005%
.6	5.000	.472	.471	.212%	1.26×10^{-2}	1.26×10^{-2}	.0001%
.6	6.000	.438	.438	.000%	8.02×10^{-3}	8.02×10^{-3}	.0000%
.6	7.000	.412	.411	.243%	5.25×10^{-3}	5.25×10^{-3}	.0006%
.6	8.000	.390	.390	.000%	3.52×10^{-3}	3.52×10^{-3}	.0000%
.6	9.000	.371	.372	.270%	2.40×10^{-3}	2.40×10^{-3}	.0016%
.6	10.000	.355	.356	.282%	1.67×10^{-3}	1.67×10^{-3}	.0011%
.6	12.000	.329	.330	.304%	8.44×10^{-4}	8.44×10^{-4}	.0020%
.6	14.000	.309	.309	.000%	4.46×10^{-4}	4.46×10^{-4}	.0000%
.6	16.000	.292	.292	.000%	2.45×10^{-4}	2.45×10^{-4}	.0000%
.6	18.000	.277	.278	.361%	1.39×10^{-4}	1.39×10^{-4}	.0025%
.6	20.000	.265	.265	.000%	8.07×10^{-5}	8.07×10^{-5}	.0000%
.6	22.000	.255	.254	.392%	4.80×10^{-5}	4.80×10^{-5}	.0002%
.6	24.000	.245	.244	.408%	2.91×10^{-5}	2.91×10^{-5}	.0151%
.6	26.000	.237	.236	.422%	1.80×10^{-5}	1.80×10^{-5}	.0089%
.6	28.000	.229	.228	.437%	1.13×10^{-5}	1.13×10^{-5}	.0251%
.6	30.000	.223	.221	.897%	7.18×10^{-6}	7.18×10^{-6}	.0397%
.6	32.000	.216	.215	.463%	4.63×10^{-6}	4.63×10^{-6}	.0339%
.6	34.000	.211	.209	.948%	3.02×10^{-6}	3.02×10^{-6}	.0646%
.6	36.000	.206	.204	.971%	1.99×10^{-6}	1.99×10^{-6}	.0555%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 3

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.7	.001	1.638	1.629	.549%	4.28×10^{-1}	4.28×10^{-1}	.0015%
.7	.002	1.635	1.640	.306%	4.27×10^{-1}	4.27×10^{-1}	.0004%
.7	.003	1.633	1.629	.245%	4.27×10^{-1}	4.27×10^{-1}	.0002%
.7	.004	1.630	1.623	.429%	4.26×10^{-1}	4.26×10^{-1}	.0009%
.7	.006	1.625	1.616	.554%	4.25×10^{-1}	4.25×10^{-1}	.0014%
.7	.008	1.619	1.612	.432%	4.23×10^{-1}	4.23×10^{-1}	.0010%
.7	.010	1.614	1.608	.372%	4.22×10^{-1}	4.22×10^{-1}	.0007%
.7	.015	1.602	1.599	.187%	4.19×10^{-1}	4.19×10^{-1}	.0001%
.7	.020	1.589	1.588	.063%	4.15×10^{-1}	4.15×10^{-1}	.0000%
.7	.025	1.578	1.577	.063%	4.12×10^{-1}	4.12×10^{-1}	.0000%
.7	.030	1.566	1.566	.000%	4.09×10^{-1}	4.09×10^{-1}	.0000%
.7	.035	1.555	1.554	.064%	4.06×10^{-1}	4.06×10^{-1}	.0000%
.7	.040	1.544	1.543	.065%	4.02×10^{-1}	4.02×10^{-1}	.0000%
.7	.045	1.534	1.532	.130%	3.99×10^{-1}	3.99×10^{-1}	.0001%
.7	.050	1.524	1.521	.197%	3.96×10^{-1}	3.96×10^{-1}	.0002%
.7	.055	1.514	1.510	.264%	3.93×10^{-1}	3.93×10^{-1}	.0004%
.7	.060	1.505	1.500	.332%	3.90×10^{-1}	3.90×10^{-1}	.0005%
.7	.065	1.495	1.490	.334%	3.87×10^{-1}	3.87×10^{-1}	.0007%
.7	.070	1.486	1.481	.336%	3.85×10^{-1}	3.85×10^{-1}	.0007%
.7	.075	1.477	1.471	.406%	3.82×10^{-1}	3.82×10^{-1}	.0011%
.7	.080	1.469	1.462	.477%	3.79×10^{-1}	3.79×10^{-1}	.0013%
.7	.085	1.460	1.453	.479%	3.76×10^{-1}	3.76×10^{-1}	.0015%
.7	.090	1.452	1.445	.482%	3.73×10^{-1}	3.73×10^{-1}	.0015%
.7	.095	1.444	1.436	.554%	3.71×10^{-1}	3.71×10^{-1}	.0019%
.7	.100	1.436	1.428	.557%	3.68×10^{-1}	3.68×10^{-1}	.0020%
.7	.150	1.366	1.356	.732%	3.43×10^{-1}	3.43×10^{-1}	.0038%
.7	.200	1.308	1.298	.765%	3.21×10^{-1}	3.21×10^{-1}	.0045%
.7	.250	1.259	1.250	.715%	3.01×10^{-1}	3.01×10^{-1}	.0040%
.7	.300	1.216	1.208	.658%	2.83×10^{-1}	2.83×10^{-1}	.0040%
.7	.350	1.178	1.172	.509%	2.67×10^{-1}	2.67×10^{-1}	.0030%
.7	.400	1.145	1.139	.524%	2.52×10^{-1}	2.52×10^{-1}	.0030%
.7	.450	1.115	1.110	.448%	2.38×10^{-1}	2.38×10^{-1}	.0024%
.7	.500	1.088	1.084	.368%	2.25×10^{-1}	2.25×10^{-1}	.0016%
.7	.550	1.063	1.059	.376%	2.13×10^{-1}	2.13×10^{-1}	.0019%
.7	.600	1.041	1.037	.384%	2.02×10^{-1}	2.02×10^{-1}	.0014%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 4

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.7	.650	1.019	1.017	.196%	1.92×10^{-1}	1.92×10^{-1}	.0007%
.7	.700	1.000	.997	.300%	1.83×10^{-1}	1.83×10^{-1}	.0012%
.7	.750	.982	.980	.204%	1.74×10^{-1}	1.74×10^{-1}	.0005%
.7	.800	.965	.963	.207%	1.66×10^{-1}	1.66×10^{-1}	.0005%
.7	.850	.949	.947	.211%	1.58×10^{-1}	1.58×10^{-1}	.0006%
.7	.900	.934	.932	.214%	1.51×10^{-1}	1.51×10^{-1}	.0007%
.7	.950	.920	.918	.217%	1.44×10^{-1}	1.44×10^{-1}	.0006%
.7	1.000	.906	.905	.110%	1.37×10^{-1}	1.37×10^{-1}	.0004%
.7	1.500	.803	.802	.125%	8.98×10^{-2}	8.98×10^{-2}	.0002%
.7	2.000	.732	.731	.137%	6.12×10^{-2}	6.12×10^{-2}	.0008%
.7	2.500	.680	.678	.294%	4.30×10^{-2}	4.30×10^{-2}	.0029%
.7	3.000	.639	.637	.313%	3.09×10^{-2}	3.09×10^{-2}	.0039%
.7	3.500	.606	.604	.330%	2.27×10^{-2}	2.27×10^{-2}	.0039%
.7	4.000	.578	.576	.346%	1.69×10^{-2}	1.69×10^{-2}	.0053%
.7	4.500	.555	.552	.541%	1.27×10^{-2}	1.27×10^{-2}	.0075%
.7	5.000	.534	.531	.562%	9.68×10^{-3}	9.68×10^{-3}	.0115%
.7	6.000	.500	.497	.600%	5.78×10^{-3}	5.78×10^{-3}	.0116%
.7	7.000	.472	.470	.424%	3.56×10^{-3}	3.56×10^{-3}	.0085%
.7	8.000	.449	.448	.223%	2.24×10^{-3}	2.24×10^{-3}	.0031%
.7	9.000	.430	.429	.253%	1.45×10^{-3}	1.45×10^{-3}	.0012%
.7	10.000	.413	.412	.242%	9.49×10^{-4}	9.49×10^{-4}	.0028%
.7	12.000	.385	.385	.000%	4.28×10^{-4}	4.28×10^{-4}	.0000%
.7	14.000	.363	.364	.275%	2.03×10^{-4}	2.03×10^{-4}	.0043%
.7	16.000	.345	.345	.290%	9.99×10^{-5}	9.99×10^{-5}	.0085%
.7	18.000	.329	.330	.304%	5.09×10^{-5}	5.09×10^{-5}	.0021%
.7	20.000	.316	.317	.316%	2.67×10^{-5}	2.67×10^{-5}	.0069%
.7	22.000	.304	.305	.329%	1.44×10^{-5}	1.44×10^{-5}	.0004%
.7	24.000	.294	.295	.340%	7.89×10^{-6}	7.89×10^{-6}	.0055%
.7	26.000	.285	.286	.351%	4.42×10^{-6}	4.42×10^{-6}	.0094%
.7	28.000	.277	.277	.000%	2.52×10^{-6}	2.52×10^{-6}	.0000%
.7	30.000	.269	.269	.000%	1.46×10^{-6}	1.46×10^{-6}	.0000%
.7	32.000	.263	.262	.380%	8.58×10^{-7}	8.58×10^{-7}	.0025%
.7	34.000	.256	.256	.000%	5.11×10^{-7}	5.11×10^{-7}	.0000%
.7	36.000	.251	.250	.398%	3.08×10^{-7}	3.08×10^{-7}	.0020%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 5

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.8	.001	1.540	1.532	.519%	4.28×10^{-1}	4.28×10^{-1}	.0019%
.8	.002	1.539	1.542	.195%	4.28×10^{-1}	4.28×10^{-1}	.0003%
.8	.003	1.537	1.533	.260%	4.27×10^{-1}	4.27×10^{-1}	.0004%
.8	.004	1.535	1.528	.456%	4.26×10^{-1}	4.26×10^{-1}	.0013%
.8	.006	1.531	1.525	.523%	4.25×10^{-1}	4.25×10^{-1}	.0019%
.8	.008	1.528	1.520	.524%	4.24×10^{-1}	4.24×10^{-1}	.0017%
.8	.010	1.524	1.518	.394%	4.22×10^{-1}	4.22×10^{-1}	.0011%
.8	.015	1.515	1.513	.132%	4.19×10^{-1}	4.19×10^{-1}	.0002%
.8	.020	1.507	1.506	.066%	4.16×10^{-1}	4.16×10^{-1}	.0000%
.8	.025	1.499	1.498	.067%	4.13×10^{-1}	4.13×10^{-1}	.0000%
.8	.030	1.491	1.490	.067%	4.10×10^{-1}	4.10×10^{-1}	.0000%
.8	.035	1.483	1.482	.067%	4.07×10^{-1}	4.07×10^{-1}	.0000%
.8	.040	1.475	1.474	.068%	4.04×10^{-1}	4.04×10^{-1}	.0000%
.8	.045	1.468	1.467	.068%	4.01×10^{-1}	4.01×10^{-1}	.0000%
.8	.050	1.460	1.459	.068%	3.98×10^{-1}	3.98×10^{-1}	.0001%
.8	.055	1.453	1.451	.138%	3.95×10^{-1}	3.95×10^{-1}	.0002%
.8	.060	1.446	1.444	.138%	3.92×10^{-1}	3.92×10^{-1}	.0002%
.8	.065	1.439	1.436	.208%	3.89×10^{-1}	3.89×10^{-1}	.0004%
.8	.070	1.432	1.429	.209%	3.87×10^{-1}	3.87×10^{-1}	.0004%
.8	.075	1.426	1.422	.281%	3.84×10^{-1}	3.84×10^{-1}	.0006%
.8	.080	1.419	1.415	.282%	3.81×10^{-1}	3.81×10^{-1}	.0008%
.8	.085	1.413	1.408	.354%	3.78×10^{-1}	3.78×10^{-1}	.0010%
.8	.090	1.407	1.402	.355%	3.76×10^{-1}	3.76×10^{-1}	.0010%
.8	.095	1.401	1.395	.428%	3.73×10^{-1}	3.73×10^{-1}	.0014%
.8	.100	1.395	1.389	.430%	3.71×10^{-1}	3.71×10^{-1}	.0014%
.8	.150	1.341	1.333	.597%	3.46×10^{-1}	3.46×10^{-1}	.0029%
.8	.200	1.294	1.287	.541%	3.24×10^{-1}	3.24×10^{-1}	.0032%
.8	.250	1.254	1.247	.558%	3.04×10^{-1}	3.04×10^{-1}	.0035%
.8	.300	1.219	1.212	.574%	2.86×10^{-1}	2.86×10^{-1}	.0036%
.8	.350	1.187	1.182	.421%	2.69×10^{-1}	2.69×10^{-1}	.0024%
.8	.400	1.159	1.154	.431%	2.54×10^{-1}	2.54×10^{-1}	.0023%
.8	.450	1.133	1.129	.353%	2.40×10^{-1}	2.40×10^{-1}	.0018%
.8	.500	1.110	1.106	.360%	2.27×10^{-1}	2.27×10^{-1}	.0014%
.8	.550	1.088	1.085	.276%	2.14×10^{-1}	2.14×10^{-1}	.0010%
.8	.600	1.068	1.065	.281%	2.03×10^{-1}	2.03×10^{-1}	.0010%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 6

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.8	.650	1.049	1.047	.191%	1.93×10^{-1}	1.93×10^{-1}	.0006%
.8	.700	1.032	1.030	.194%	1.83×10^{-1}	1.83×10^{-1}	.0004%
.8	.750	1.015	1.014	.099%	1.74×10^{-1}	1.74×10^{-1}	.0003%
.8	.800	1.000	.999	.100%	1.65×10^{-1}	1.65×10^{-1}	.0002%
.8	.850	.986	.985	.101%	1.57×10^{-1}	1.57×10^{-1}	.0000%
.8	.900	.972	.971	.103%	1.50×10^{-1}	1.50×10^{-1}	.0001%
.8	.950	.959	.959	.000%	1.43×10^{-1}	1.43×10^{-1}	.0000%
.8	1.000	.947	.947	.000%	1.36×10^{-1}	1.36×10^{-1}	.0000%
.8	1.500	.850	.850	.000%	8.70×10^{-2}	8.70×10^{-2}	.0000%
.8	2.000	.783	.783	.000%	5.79×10^{-2}	5.79×10^{-2}	.0000%
.8	2.500	.733	.732	.136%	3.96×10^{-2}	3.96×10^{-2}	.0002%
.8	3.000	.693	.692	.144%	2.78×10^{-2}	2.78×10^{-2}	.0004%
.8	3.500	.660	.658	.303%	1.98×10^{-2}	1.98×10^{-2}	.0036%
.8	4.000	.632	.630	.316%	1.43×10^{-2}	1.43×10^{-2}	.0059%
.8	4.500	.609	.607	.328%	1.05×10^{-2}	1.05×10^{-2}	.0037%
.8	5.000	.588	.586	.340%	7.80×10^{-3}	7.80×10^{-3}	.0059%
.8	6.000	.554	.551	.542%	4.41×10^{-3}	4.41×10^{-3}	.0104%
.8	7.000	.526	.523	.570%	2.57×10^{-3}	2.57×10^{-3}	.0123%
.8	8.000	.502	.500	.398%	1.54×10^{-3}	1.54×10^{-3}	.0107%
.8	9.000	.482	.481	.207%	9.41×10^{-4}	9.41×10^{-4}	.0038%
.8	10.000	.465	.464	.215%	5.86×10^{-4}	5.86×10^{-4}	.0026%
.8	12.000	.436	.436	.000%	2.38×10^{-4}	2.38×10^{-4}	.0000%
.8	14.000	.413	.413	.000%	1.02×10^{-4}	1.02×10^{-4}	.0000%
.8	16.000	.394	.395	.254%	4.55×10^{-5}	4.55×10^{-5}	.0064%
.8	18.000	.378	.379	.265%	2.11×10^{-5}	2.11×10^{-5}	.0108%
.8	20.000	.364	.365	.275%	1.00×10^{-5}	1.00×10^{-5}	.0130%
.8	22.000	.351	.352	.285%	4.91×10^{-6}	4.91×10^{-6}	.0026%
.8	24.000	.340	.341	.294%	2.46×10^{-6}	2.46×10^{-6}	.0009%
.8	26.000	.331	.331	.000%	1.26×10^{-6}	1.26×10^{-6}	.0000%
.8	28.000	.322	.322	.000%	6.55×10^{-7}	6.55×10^{-7}	.0000%
.8	30.000	.314	.313	.318%	3.47×10^{-7}	3.47×10^{-7}	.0100%
.8	32.000	.307	.306	.326%	1.86×10^{-7}	1.86×10^{-7}	.0016%
.8	34.000	.300	.298	.667%	1.02×10^{-7}	1.02×10^{-7}	.0509%
.8	36.000	.294	.291	1.020%	5.62×10^{-8}	5.61×10^{-8}	.1103%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 7

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.9	.001	1.468	1.461	.477%	4.28×10^{-1}	4.28×10^{-1}	.0021%
.9	.002	1.467	1.471	.273%	4.28×10^{-1}	4.28×10^{-1}	.0006%
.9	.003	1.466	1.464	.136%	4.27×10^{-1}	4.27×10^{-1}	.0001%
.9	.004	1.464	1.459	.342%	4.26×10^{-1}	4.26×10^{-1}	.0011%
.9	.006	1.462	1.456	.410%	4.25×10^{-1}	4.25×10^{-1}	.0013%
.9	.008	1.459	1.454	.343%	4.24×10^{-1}	4.24×10^{-1}	.0011%
.9	.010	1.457	1.453	.275%	4.23×10^{-1}	4.23×10^{-1}	.0005%
.9	.015	1.450	1.449	.069%	4.20×10^{-1}	4.20×10^{-1}	.0001%
.9	.020	1.444	1.445	.069%	4.17×10^{-1}	4.17×10^{-1}	.0000%
.9	.025	1.438	1.440	.139%	4.14×10^{-1}	4.14×10^{-1}	.0001%
.9	.030	1.432	1.434	.140%	4.11×10^{-1}	4.11×10^{-1}	.0001%
.9	.035	1.426	1.428	.140%	4.08×10^{-1}	4.08×10^{-1}	.0001%
.9	.040	1.421	1.423	.141%	4.05×10^{-1}	4.05×10^{-1}	.0002%
.9	.045	1.415	1.417	.141%	4.02×10^{-1}	4.02×10^{-1}	.0002%
.9	.050	1.409	1.411	.142%	3.99×10^{-1}	3.99×10^{-1}	.0001%
.9	.055	1.404	1.405	.071%	3.96×10^{-1}	3.96×10^{-1}	.0000%
.9	.060	1.399	1.400	.071%	3.94×10^{-1}	3.94×10^{-1}	.0001%
.9	.065	1.393	1.394	.072%	3.91×10^{-1}	3.91×10^{-1}	.0000%
.9	.070	1.388	1.389	.072%	3.88×10^{-1}	3.88×10^{-1}	.0000%
.9	.075	1.383	1.383	.000%	3.85×10^{-1}	3.85×10^{-1}	.0000%
.9	.080	1.378	1.378	.000%	3.83×10^{-1}	3.83×10^{-1}	.0000%
.9	.085	1.373	1.373	.000%	3.80×10^{-1}	3.80×10^{-1}	.0000%
.9	.090	1.369	1.368	.073%	3.78×10^{-1}	3.78×10^{-1}	.0000%
.9	.095	1.364	1.363	.073%	3.75×10^{-1}	3.75×10^{-1}	.0000%
.9	.100	1.359	1.358	.074%	3.72×10^{-1}	3.72×10^{-1}	.0001%
.9	.150	1.316	1.314	.152%	3.48×10^{-1}	3.48×10^{-1}	.0003%
.9	.200	1.279	1.276	.235%	3.26×10^{-1}	3.26×10^{-1}	.0007%
.9	.250	1.246	1.243	.241%	3.07×10^{-1}	3.07×10^{-1}	.0007%
.9	.300	1.216	1.214	.164%	2.88×10^{-1}	2.88×10^{-1}	.0005%
.9	.350	1.190	1.188	.168%	2.71×10^{-1}	2.71×10^{-1}	.0003%
.9	.400	1.166	1.164	.172%	2.56×10^{-1}	2.56×10^{-1}	.0002%
.9	.450	1.143	1.143	.000%	2.42×10^{-1}	2.42×10^{-1}	.0000%
.9	.500	1.123	1.123	.000%	2.28×10^{-1}	2.28×10^{-1}	.0000%
.9	.550	1.104	1.104	.000%	2.16×10^{-1}	2.16×10^{-1}	.0000%
.9	.600	1.086	1.087	.092%	2.04×10^{-1}	2.04×10^{-1}	.0001%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 0

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.9	.650	1.069	1.070	.094%	1.94×10^{-1}	1.94×10^{-1}	.0000%
.9	.700	1.054	1.055	.095%	1.84×10^{-1}	1.84×10^{-1}	.0002%
.9	.750	1.039	1.041	.192%	1.74×10^{-1}	1.74×10^{-1}	.0005%
.9	.800	1.025	1.027	.195%	1.66×10^{-1}	1.66×10^{-1}	.0004%
.9	.850	1.012	1.014	.198%	1.57×10^{-1}	1.57×10^{-1}	.0005%
.9	.900	1.000	1.002	.200%	1.50×10^{-1}	1.50×10^{-1}	.0008%
.9	.950	.988	.991	.304%	1.42×10^{-1}	1.42×10^{-1}	.0017%
.9	1.000	.977	.979	.205%	1.35×10^{-1}	1.35×10^{-1}	.0009%
.9	1.500	.888	.890	.225%	8.51×10^{-2}	8.51×10^{-2}	.0020%
.9	2.000	.824	.826	.243%	5.55×10^{-2}	5.55×10^{-2}	.0013%
.9	2.500	.776	.777	.129%	3.72×10^{-2}	3.72×10^{-2}	.0004%
.9	3.000	.738	.738	.000%	2.55×10^{-2}	2.55×10^{-2}	.0000%
.9	3.500	.706	.705	.142%	1.78×10^{-2}	1.78×10^{-2}	.0005%
.9	4.000	.679	.678	.147%	1.26×10^{-2}	1.26×10^{-2}	.0006%
.9	4.500	.656	.654	.305%	9.02×10^{-3}	9.02×10^{-3}	.0023%
.9	5.000	.635	.633	.315%	6.53×10^{-3}	6.53×10^{-3}	.0057%
.9	6.000	.601	.599	.333%	3.52×10^{-3}	3.52×10^{-3}	.0048%
.9	7.000	.573	.571	.349%	1.96×10^{-3}	1.96×10^{-3}	.0056%
.9	8.000	.549	.547	.364%	1.12×10^{-3}	1.12×10^{-3}	.0112%
.9	9.000	.529	.527	.378%	6.53×10^{-4}	6.53×10^{-4}	.0115%
.9	10.000	.512	.510	.391%	3.88×10^{-4}	3.88×10^{-4}	.0067%
.9	12.000	.482	.482	.000%	1.44×10^{-4}	1.44×10^{-4}	.0000%
.9	14.000	.455	.459	.000%	5.62×10^{-5}	5.62×10^{-5}	.0000%
.9	16.000	.439	.439	.000%	2.29×10^{-5}	2.29×10^{-5}	.0000%
.9	18.000	.422	.423	.237%	9.69×10^{-6}	9.68×10^{-6}	.0041%
.9	20.000	.408	.408	.000%	4.23×10^{-6}	4.23×10^{-6}	.0000%
.9	22.000	.395	.396	.253%	1.89×10^{-6}	1.89×10^{-6}	.0106%
.9	24.000	.384	.384	.000%	8.70×10^{-7}	8.70×10^{-7}	.0000%
.9	26.000	.373	.373	.000%	4.08×10^{-7}	4.08×10^{-7}	.0000%
.9	28.000	.364	.364	.000%	1.95×10^{-7}	1.95×10^{-7}	.0000%
.9	30.000	.356	.354	.562%	9.51×10^{-8}	9.51×10^{-8}	.0343%
.9	32.000	.348	.346	.575%	4.71×10^{-8}	4.70×10^{-8}	.0537%
.9	34.000	.341	.338	.880%	2.36×10^{-8}	2.36×10^{-8}	.1234%
.9	36.000	.334	.331	.898%	1.20×10^{-8}	1.20×10^{-8}	.1745%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 9

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.0	.001	1.413	1.408	.354%	4.28×10^{-1}	4.28×10^{-1}	.0014%
1.0	.002	1.412	1.417	.354%	4.28×10^{-1}	4.28×10^{-1}	.0011%
1.0	.003	1.411	1.411	.000%	4.27×10^{-1}	4.27×10^{-1}	.0000%
1.0	.004	1.410	1.407	.213%	4.26×10^{-1}	4.26×10^{-1}	.0005%
1.0	.006	1.408	1.404	.284%	4.25×10^{-1}	4.25×10^{-1}	.0009%
1.0	.008	1.406	1.403	.213%	4.24×10^{-1}	4.24×10^{-1}	.0005%
1.0	.010	1.404	1.403	.071%	4.23×10^{-1}	4.23×10^{-1}	.0001%
1.0	.015	1.400	1.400	.000%	4.20×10^{-1}	4.20×10^{-1}	.0000%
1.0	.020	1.395	1.397	.143%	4.17×10^{-1}	4.17×10^{-1}	.0002%
1.0	.025	1.390	1.393	.216%	4.14×10^{-1}	4.14×10^{-1}	.0004%
1.0	.030	1.386	1.389	.216%	4.11×10^{-1}	4.11×10^{-1}	.0006%
1.0	.035	1.381	1.385	.290%	4.08×10^{-1}	4.08×10^{-1}	.0008%
1.0	.040	1.377	1.381	.290%	4.06×10^{-1}	4.06×10^{-1}	.0010%
1.0	.045	1.372	1.376	.292%	4.03×10^{-1}	4.03×10^{-1}	.0007%
1.0	.050	1.368	1.372	.292%	4.00×10^{-1}	4.00×10^{-1}	.0008%
1.0	.055	1.364	1.367	.220%	3.97×10^{-1}	3.97×10^{-1}	.0005%
1.0	.060	1.360	1.363	.221%	3.95×10^{-1}	3.95×10^{-1}	.0006%
1.0	.065	1.356	1.359	.221%	3.92×10^{-1}	3.92×10^{-1}	.0006%
1.0	.070	1.352	1.355	.222%	3.89×10^{-1}	3.89×10^{-1}	.0007%
1.0	.075	1.348	1.351	.223%	3.87×10^{-1}	3.87×10^{-1}	.0007%
1.0	.080	1.344	1.346	.149%	3.84×10^{-1}	3.84×10^{-1}	.0003%
1.0	.085	1.340	1.342	.149%	3.82×10^{-1}	3.82×10^{-1}	.0003%
1.0	.090	1.336	1.338	.150%	3.79×10^{-1}	3.79×10^{-1}	.0002%
1.0	.095	1.332	1.335	.225%	3.76×10^{-1}	3.76×10^{-1}	.0004%
1.0	.100	1.329	1.321	.602%	3.74×10^{-1}	3.74×10^{-1}	.0041%
1.0	.150	1.294	1.295	.077%	3.50×10^{-1}	3.50×10^{-1}	.0001%
1.0	.200	1.264	1.264	.000%	3.29×10^{-1}	3.29×10^{-1}	.0000%
1.0	.250	1.236	1.237	.081%	3.09×10^{-1}	3.09×10^{-1}	.0001%
1.0	.300	1.211	1.212	.083%	2.90×10^{-1}	2.90×10^{-1}	.0001%
1.0	.350	1.188	1.190	.168%	2.73×10^{-1}	2.73×10^{-1}	.0002%
1.0	.400	1.168	1.169	.086%	2.58×10^{-1}	2.58×10^{-1}	.0002%
1.0	.450	1.148	1.150	.174%	2.43×10^{-1}	2.43×10^{-1}	.0004%
1.0	.500	1.130	1.133	.265%	2.30×10^{-1}	2.30×10^{-1}	.0010%
1.0	.550	1.114	1.116	.180%	2.17×10^{-1}	2.17×10^{-1}	.0008%
1.0	.600	1.098	1.101	.273%	2.06×10^{-1}	2.06×10^{-1}	.0014%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 10

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.0	.650	1.083	1.086	.277%	1.95×10^{-1}	1.95×10^{-1}	.0012%
1.0	.700	1.069	1.073	.374%	1.85×10^{-1}	1.84×10^{-1}	.0023%
1.0	.750	1.056	1.060	.379%	1.75×10^{-1}	1.75×10^{-1}	.0026%
1.0	.800	1.044	1.048	.383%	1.66×10^{-1}	1.66×10^{-1}	.0034%
1.0	.850	1.032	1.036	.388%	1.58×10^{-1}	1.58×10^{-1}	.0032%
1.0	.900	1.021	1.025	.392%	1.50×10^{-1}	1.50×10^{-1}	.0038%
1.0	.950	1.010	1.014	.396%	1.42×10^{-1}	1.42×10^{-1}	.0034%
1.0	1.000	1.000	1.004	.400%	1.35×10^{-1}	1.35×10^{-1}	.0040%
1.0	1.500	.917	.921	.436%	8.39×10^{-2}	8.39×10^{-2}	.0045%
1.0	2.000	.858	.861	.350%	5.39×10^{-2}	5.39×10^{-2}	.0041%
1.0	2.500	.812	.814	.246%	3.55×10^{-2}	3.55×10^{-2}	.0016%
1.0	3.000	.775	.776	.129%	2.39×10^{-2}	2.39×10^{-2}	.0001%
1.0	3.500	.745	.745	.060%	1.63×10^{-2}	1.63×10^{-2}	.0000%
1.0	4.000	.719	.718	.139%	1.13×10^{-2}	1.13×10^{-2}	.0000%
1.0	4.500	.696	.695	.144%	7.96×10^{-3}	7.96×10^{-3}	.0007%
1.0	5.000	.676	.674	.296%	5.65×10^{-3}	5.65×10^{-3}	.9043%
1.0	6.000	.642	.640	.312%	2.92×10^{-3}	2.92×10^{-3}	.6067%
1.0	7.000	.614	.612	.326%	1.56×10^{-3}	1.56×10^{-3}	.0103%
1.0	8.000	.591	.589	.338%	8.54×10^{-4}	8.54×10^{-4}	.0086%
1.0	9.000	.571	.569	.350%	4.78×10^{-4}	4.78×10^{-4}	.0090%
1.0	10.000	.553	.552	.181%	2.73×10^{-4}	2.73×10^{-4}	.0049%
1.0	12.000	.524	.523	.191%	9.29×10^{-5}	9.29×10^{-5}	.0030%
1.0	14.000	.500	.500	.000%	3.34×10^{-5}	3.34×10^{-5}	.0000%
1.0	16.000	.480	.480	.000%	1.25×10^{-5}	1.25×10^{-5}	.0000%
1.0	18.000	.463	.463	.000%	4.89×10^{-6}	4.89×10^{-6}	.0000%
1.0	20.000	.448	.448	.000%	1.97×10^{-6}	1.97×10^{-6}	.0000%
1.0	22.000	.435	.435	.000%	8.13×10^{-7}	8.13×10^{-7}	.0000%
1.0	24.000	.423	.423	.000%	3.45×10^{-7}	3.45×10^{-7}	.0000%
1.0	26.000	.413	.412	.242%	1.49×10^{-7}	1.49×10^{-7}	.0070%
1.0	28.000	.403	.402	.248%	6.61×10^{-8}	6.61×10^{-8}	.0187%
1.0	30.000	.395	.393	.506%	2.98×10^{-8}	2.97×10^{-8}	.0324%
1.0	32.000	.387	.384	.775%	1.36×10^{-8}	1.36×10^{-8}	.0952%
1.0	34.000	.379	.376	.792%	6.33×10^{-9}	6.32×10^{-9}	.1587%
1.0	36.000	.373	.368	1.340%	2.99×10^{-9}	2.98×10^{-9}	.3141%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 11

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.1	.001	1.370	1.367	.219%	4.28×10^{-1}	4.28×10^{-1}	.0004%
1.1	.002	1.369	1.374	.365%	4.28×10^{-1}	4.28×10^{-1}	.0017%
1.1	.003	1.368	1.368	.000%	4.27×10^{-1}	4.27×10^{-1}	.0000%
1.1	.004	1.367	1.366	.073%	4.27×10^{-1}	4.27×10^{-1}	.0001%
1.1	.006	1.366	1.364	.146%	4.25×10^{-1}	4.25×10^{-1}	.0002%
1.1	.008	1.364	1.363	.073%	4.24×10^{-1}	4.24×10^{-1}	.0001%
1.1	.010	1.363	1.362	.073%	4.23×10^{-1}	4.23×10^{-1}	.0000%
1.1	.015	1.359	1.360	.074%	4.20×10^{-1}	4.20×10^{-1}	.0001%
1.1	.020	1.355	1.358	.221%	4.17×10^{-1}	4.17×10^{-1}	.0005%
1.1	.025	1.352	1.355	.222%	4.15×10^{-1}	4.15×10^{-1}	.0008%
1.1	.030	1.348	1.351	.223%	4.12×10^{-1}	4.12×10^{-1}	.0006%
1.1	.035	1.345	1.348	.223%	4.09×10^{-1}	4.09×10^{-1}	.0008%
1.1	.040	1.341	1.345	.298%	4.06×10^{-1}	4.06×10^{-1}	.0011%
1.1	.045	1.338	1.341	.224%	4.04×10^{-1}	4.04×10^{-1}	.0008%
1.1	.050	1.334	1.338	.300%	4.01×10^{-1}	4.01×10^{-1}	.0011%
1.1	.055	1.331	1.334	.225%	3.98×10^{-1}	3.98×10^{-1}	.0008%
1.1	.060	1.327	1.331	.301%	3.96×10^{-1}	3.96×10^{-1}	.0009%
1.1	.065	1.324	1.328	.302%	3.93×10^{-1}	3.93×10^{-1}	.0011%
1.1	.070	1.321	1.324	.227%	3.90×10^{-1}	3.90×10^{-1}	.0007%
1.1	.075	1.318	1.321	.228%	3.88×10^{-1}	3.88×10^{-1}	.0008%
1.1	.080	1.315	1.318	.228%	3.85×10^{-1}	3.85×10^{-1}	.0009%
1.1	.085	1.312	1.314	.152%	3.83×10^{-1}	3.83×10^{-1}	.0005%
1.1	.090	1.308	1.311	.229%	3.80×10^{-1}	3.80×10^{-1}	.0005%
1.1	.095	1.305	1.308	.230%	3.78×10^{-1}	3.78×10^{-1}	.0005%
1.1	.100	1.302	1.305	.230%	3.75×10^{-1}	3.75×10^{-1}	.0006%
1.1	.150	1.274	1.276	.157%	3.52×10^{-1}	3.52×10^{-1}	.0003%
1.1	.200	1.249	1.250	.080%	3.30×10^{-1}	3.30×10^{-1}	.0002%
1.1	.250	1.226	1.227	.082%	3.11×10^{-1}	3.11×10^{-1}	.0002%
1.1	.300	1.204	1.206	.166%	2.92×10^{-1}	2.92×10^{-1}	.0003%
1.1	.350	1.185	1.187	.169%	2.75×10^{-1}	2.75×10^{-1}	.0006%
1.1	.400	1.167	1.169	.171%	2.60×10^{-1}	2.60×10^{-1}	.0007%
1.1	.450	1.150	1.152	.174%	2.45×10^{-1}	2.45×10^{-1}	.0006%
1.1	.500	1.134	1.137	.265%	2.31×10^{-1}	2.31×10^{-1}	.0011%
1.1	.550	1.120	1.122	.179%	2.19×10^{-1}	2.19×10^{-1}	.0010%
1.1	.600	1.106	1.109	.271%	2.07×10^{-1}	2.07×10^{-1}	.0019%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 12

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.1	.650	1.093	1.096	.274%	1.96×10^{-1}	1.96×10^{-1}	.0021%
1.1	.700	1.080	1.084	.370%	1.85×10^{-1}	1.85×10^{-1}	.0028%
1.1	.750	1.069	1.072	.281%	1.76×10^{-1}	1.76×10^{-1}	.0025%
1.1	.800	1.057	1.061	.378%	1.67×10^{-1}	1.67×10^{-1}	.0030%
1.1	.850	1.047	1.050	.287%	1.58×10^{-1}	1.58×10^{-1}	.0025%
1.1	.900	1.037	1.040	.289%	1.50×10^{-1}	1.50×10^{-1}	.0029%
1.1	.950	1.027	1.031	.389%	1.43×10^{-1}	1.43×10^{-1}	.0045%
1.1	1.000	1.018	1.021	.295%	1.35×10^{-1}	1.35×10^{-1}	.0032%
1.1	1.500	.941	.945	.425%	8.31×10^{-2}	8.31×10^{-2}	.0048%
1.1	2.000	.886	.889	.339%	5.27×10^{-2}	5.27×10^{-2}	.0049%
1.1	2.500	.843	.845	.237%	3.42×10^{-2}	3.42×10^{-2}	.0036%
1.1	3.000	.807	.808	.124%	2.26×10^{-2}	2.26×10^{-2}	.0001%
1.1	3.500	.778	.778	.000%	1.52×10^{-2}	1.52×10^{-2}	.0000%
1.1	4.000	.753	.752	.133%	1.04×10^{-2}	1.04×10^{-2}	.0003%
1.1	4.500	.731	.730	.137%	7.17×10^{-3}	7.17×10^{-3}	.0004%
1.1	5.000	.711	.710	.141%	5.00×10^{-3}	5.00×10^{-3}	.0020%
1.1	6.000	.678	.677	.147%	2.50×10^{-3}	2.50×10^{-3}	.0024%
1.1	7.000	.651	.649	.307%	1.29×10^{-3}	1.29×10^{-3}	.0079%
1.1	8.000	.628	.626	.318%	6.79×10^{-4}	6.79×10^{-4}	.0089%
1.1	9.000	.608	.606	.329%	3.66×10^{-4}	3.66×10^{-4}	.0115%
1.1	10.000	.591	.589	.338%	2.01×10^{-4}	2.01×10^{-4}	.0080%
1.1	12.000	.561	.560	.178%	6.36×10^{-5}	6.36×10^{-5}	.0065%
1.1	14.000	.537	.537	.000%	2.12×10^{-5}	2.12×10^{-5}	.0000%
1.1	16.000	.517	.517	.000%	7.39×10^{-6}	7.39×10^{-6}	.0000%
1.1	18.000	.500	.500	.000%	2.67×10^{-6}	2.67×10^{-6}	.0000%
1.1	20.000	.485	.485	.000%	9.98×10^{-7}	9.98×10^{-7}	.0000%
1.1	22.000	.472	.472	.000%	3.83×10^{-7}	3.83×10^{-7}	.0000%
1.1	24.000	.460	.460	.000%	1.51×10^{-7}	1.51×10^{-7}	.0000%
1.1	26.000	.449	.449	.000%	6.08×10^{-8}	6.08×10^{-8}	.0000%
1.1	28.000	.440	.439	.227%	2.50×10^{-8}	2.50×10^{-8}	.0043%
1.1	30.000	.431	.429	.464%	1.05×10^{-8}	1.05×10^{-8}	.0401%
1.1	32.000	.423	.420	.709%	4.46×10^{-9}	4.46×10^{-9}	.0932%
1.1	34.000	.415	.412	.723%	1.93×10^{-9}	1.93×10^{-9}	.1405%
1.1	36.000	.408	.404	.980%	8.47×10^{-10}	8.45×10^{-10}	.2638%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 13

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.2	.001	1.334	1.333	.075%	4.28×10^{-1}	4.28×10^{-1}	.0001%
1.2	.002	1.334	1.338	.300%	4.28×10^{-1}	4.28×10^{-1}	.0015%
1.2	.003	1.333	1.334	.075%	4.27×10^{-1}	4.27×10^{-1}	.0001%
1.2	.004	1.332	1.331	.075%	4.27×10^{-1}	4.27×10^{-1}	.0001%
1.2	.006	1.331	1.330	.075%	4.25×10^{-1}	4.25×10^{-1}	.0001%
1.2	.008	1.330	1.329	.075%	4.24×10^{-1}	4.24×10^{-1}	.0001%
1.2	.010	1.329	1.328	.075%	4.23×10^{-1}	4.23×10^{-1}	.0000%
1.2	.015	1.326	1.327	.075%	4.20×10^{-1}	4.20×10^{-1}	.0001%
1.2	.020	1.323	1.324	.076%	4.18×10^{-1}	4.18×10^{-1}	.0001%
1.2	.025	1.320	1.322	.152%	4.15×10^{-1}	4.15×10^{-1}	.0004%
1.2	.030	1.317	1.319	.152%	4.12×10^{-1}	4.12×10^{-1}	.0004%
1.2	.035	1.314	1.316	.152%	4.09×10^{-1}	4.09×10^{-1}	.0003%
1.2	.040	1.311	1.313	.153%	4.07×10^{-1}	4.07×10^{-1}	.0003%
1.2	.045	1.308	1.311	.229%	4.04×10^{-1}	4.04×10^{-1}	.0006%
1.2	.050	1.306	1.308	.153%	4.01×10^{-1}	4.01×10^{-1}	.0005%
1.2	.055	1.303	1.305	.153%	3.99×10^{-1}	3.99×10^{-1}	.0004%
1.2	.060	1.300	1.302	.154%	3.96×10^{-1}	3.96×10^{-1}	.0003%
1.2	.065	1.298	1.299	.077%	3.94×10^{-1}	3.94×10^{-1}	.0002%
1.2	.070	1.295	1.297	.154%	3.91×10^{-1}	3.91×10^{-1}	.0004%
1.2	.075	1.292	1.294	.155%	3.89×10^{-1}	3.89×10^{-1}	.0003%
1.2	.080	1.290	1.291	.078%	3.86×10^{-1}	3.86×10^{-1}	.0001%
1.2	.085	1.287	1.288	.078%	3.84×10^{-1}	3.84×10^{-1}	.0001%
1.2	.090	1.285	1.286	.078%	3.81×10^{-1}	3.81×10^{-1}	.0002%
1.2	.095	1.282	1.283	.078%	3.79×10^{-1}	3.79×10^{-1}	.0001%
1.2	.100	1.280	1.281	.078%	3.76×10^{-1}	3.76×10^{-1}	.0002%
1.2	.150	1.256	1.256	.000%	3.53×10^{-1}	3.53×10^{-1}	.0000%
1.2	.200	1.235	1.235	.000%	3.32×10^{-1}	3.32×10^{-1}	.0000%
1.2	.250	1.215	1.215	.000%	3.12×10^{-1}	3.12×10^{-1}	.0000%
1.2	.300	1.197	1.197	.000%	2.94×10^{-1}	2.94×10^{-1}	.0000%
1.2	.350	1.180	1.180	.000%	2.77×10^{-1}	2.77×10^{-1}	.0000%
1.2	.400	1.164	1.165	.086%	2.61×10^{-1}	2.61×10^{-1}	.0000%
1.2	.450	1.150	1.150	.000%	2.47×10^{-1}	2.47×10^{-1}	.0000%
1.2	.500	1.136	1.137	.088%	2.33×10^{-1}	2.33×10^{-1}	.0003%
1.2	.550	1.123	1.124	.089%	2.20×10^{-1}	2.20×10^{-1}	.0003%
1.2	.600	1.110	1.112	.180%	2.08×10^{-1}	2.08×10^{-1}	.0004%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 14

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL. ERR
1.2	.650	1.099	1.100	.091%	1.97×10^{-1}	1.97×10^{-1}	.0003%
1.2	.700	1.088	1.089	.092%	1.86×10^{-1}	1.86×10^{-1}	.0004%
1.2	.750	1.077	1.079	.186%	1.77×10^{-1}	1.77×10^{-1}	.0008%
1.2	.800	1.067	1.069	.187%	1.67×10^{-1}	1.67×10^{-1}	.0009%
1.2	.850	1.057	1.059	.189%	1.59×10^{-1}	1.59×10^{-1}	.0006%
1.2	.900	1.048	1.050	.191%	1.51×10^{-1}	1.51×10^{-1}	.0008%
1.2	.950	1.039	1.042	.289%	1.43×10^{-1}	1.43×10^{-1}	.0019%
1.2	1.000	1.031	1.033	.194%	1.36×10^{-1}	1.36×10^{-1}	.0013%
1.2	1.500	.961	.963	.208%	8.26×10^{-2}	8.26×10^{-2}	.0019%
1.2	2.000	.909	.911	.220%	5.18×10^{-2}	5.18×10^{-2}	.0023%
1.2	2.500	.868	.869	.115%	3.32×10^{-2}	3.32×10^{-2}	.0006%
1.2	3.000	.835	.835	.000%	2.17×10^{-2}	2.17×10^{-2}	.0000%
1.2	3.500	.806	.807	.124%	1.44×10^{-2}	1.44×10^{-2}	.0002%
1.2	4.000	.782	.782	.000%	9.68×10^{-3}	9.68×10^{-3}	.0000%
1.2	4.500	.761	.760	.131%	6.59×10^{-3}	6.59×10^{-3}	.0010%
1.2	5.000	.742	.741	.135%	4.52×10^{-3}	4.52×10^{-3}	.0017%
1.2	6.000	.710	.709	.141%	2.19×10^{-3}	2.19×10^{-3}	.0017%
1.2	7.000	.683	.682	.146%	1.09×10^{-3}	1.09×10^{-3}	.0037%
1.2	8.000	.661	.659	.303%	5.57×10^{-4}	5.57×10^{-4}	.0079%
1.2	9.000	.641	.640	.156%	2.91×10^{-4}	2.91×10^{-4}	.0042%
1.2	10.000	.624	.623	.160%	1.54×10^{-4}	1.54×10^{-4}	.0036%
1.2	12.000	.595	.594	.168%	4.57×10^{-5}	4.57×10^{-5}	.0045%
1.2	14.000	.571	.571	.000%	1.42×10^{-5}	1.42×10^{-5}	.0000%
1.2	16.000	.551	.552	.181%	4.64×10^{-6}	4.64×10^{-6}	.0023%
1.2	18.000	.534	.535	.187%	1.57×10^{-6}	1.57×10^{-6}	.0053%
1.2	20.000	.519	.520	.193%	5.47×10^{-7}	5.47×10^{-7}	.0065%
1.2	22.000	.506	.506	.000%	1.96×10^{-7}	1.96×10^{-7}	.0000%
1.2	24.000	.494	.494	.000%	7.23×10^{-8}	7.23×10^{-8}	.0000%
1.2	26.000	.483	.483	.000%	2.72×10^{-8}	2.72×10^{-8}	.0000%
1.2	28.000	.473	.473	.000%	1.05×10^{-8}	1.05×10^{-8}	.0000%
1.2	30.000	.464	.464	.000%	4.10×10^{-9}	4.10×10^{-9}	.0000%
1.2	32.000	.456	.455	.219%	1.63×10^{-9}	1.63×10^{-9}	.0147%
1.2	34.000	.448	.447	.223%	6.60×10^{-10}	6.60×10^{-10}	.0260%
1.2	36.000	.441	.439	.454%	2.71×10^{-10}	2.71×10^{-10}	.0799%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 15

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.3	.001	1.305	1.305	.000%	4.28×10^{-1}	4.28×10^{-1}	.0000%
1.3	.002	1.305	1.309	.307%	4.28×10^{-1}	4.28×10^{-1}	.0020%
1.3	.003	1.304	1.304	.000%	4.27×10^{-1}	4.27×10^{-1}	.0000%
1.3	.004	1.304	1.302	.153%	4.27×10^{-1}	4.27×10^{-1}	.0002%
1.3	.006	1.303	1.301	.153%	4.26×10^{-1}	4.26×10^{-1}	.0002%
1.3	.008	1.302	1.301	.077%	4.24×10^{-1}	4.24×10^{-1}	.0000%
1.3	.010	1.301	1.300	.077%	4.23×10^{-1}	4.23×10^{-1}	.0000%
1.3	.015	1.298	1.298	.000%	4.21×10^{-1}	4.21×10^{-1}	.0000%
1.3	.020	1.296	1.296	.000%	4.18×10^{-1}	4.18×10^{-1}	.0000%
1.3	.025	1.293	1.294	.077%	4.15×10^{-1}	4.15×10^{-1}	.0001%
1.3	.030	1.291	1.291	.000%	4.13×10^{-1}	4.13×10^{-1}	.0000%
1.3	.035	1.288	1.289	.078%	4.10×10^{-1}	4.10×10^{-1}	.0000%
1.3	.040	1.286	1.286	.000%	4.07×10^{-1}	4.07×10^{-1}	.0000%
1.3	.045	1.284	1.284	.000%	4.05×10^{-1}	4.05×10^{-1}	.0000%
1.3	.050	1.282	1.281	.078%	4.02×10^{-1}	4.02×10^{-1}	.0000%
1.3	.055	1.279	1.279	.000%	3.99×10^{-1}	3.99×10^{-1}	.0000%
1.3	.060	1.277	1.276	.078%	3.97×10^{-1}	3.97×10^{-1}	.0001%
1.3	.065	1.275	1.274	.078%	3.94×10^{-1}	3.94×10^{-1}	.0001%
1.3	.070	1.273	1.272	.079%	3.92×10^{-1}	3.92×10^{-1}	.0000%
1.3	.075	1.270	1.269	.079%	3.89×10^{-1}	3.89×10^{-1}	.0002%
1.3	.080	1.268	1.267	.079%	3.87×10^{-1}	3.87×10^{-1}	.0002%
1.3	.085	1.266	1.265	.079%	3.84×10^{-1}	3.84×10^{-1}	.0002%
1.3	.090	1.264	1.263	.079%	3.82×10^{-1}	3.82×10^{-1}	.0001%
1.3	.095	1.262	1.261	.079%	3.80×10^{-1}	3.80×10^{-1}	.0001%
1.3	.100	1.260	1.258	.159%	3.77×10^{-1}	3.77×10^{-1}	.0004%
1.3	.150	1.240	1.238	.161%	3.54×10^{-1}	3.54×10^{-1}	.0006%
1.3	.200	1.222	1.219	.245%	3.33×10^{-1}	3.33×10^{-1}	.0011%
1.3	.250	1.205	1.203	.166%	3.14×10^{-1}	3.14×10^{-1}	.0006%
1.3	.300	1.189	1.187	.168%	2.95×10^{-1}	2.95×10^{-1}	.0008%
1.3	.350	1.175	1.172	.255%	2.78×10^{-1}	2.78×10^{-1}	.0011%
1.3	.400	1.161	1.159	.172%	2.63×10^{-1}	2.63×10^{-1}	.0006%
1.3	.450	1.148	1.146	.174%	2.48×10^{-1}	2.48×10^{-1}	.0007%
1.3	.500	1.136	1.134	.176%	2.34×10^{-1}	2.34×10^{-1}	.0005%
1.3	.550	1.124	1.123	.089%	2.21×10^{-1}	2.21×10^{-1}	.0003%
1.3	.600	1.113	1.112	.090%	2.09×10^{-1}	2.09×10^{-1}	.0003%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 16

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.3	.650	1.103	1.102	.091%	1.98×10^{-1}	1.98×10^{-1}	.0001%
1.3	.700	1.093	1.092	.091%	1.87×10^{-1}	1.87×10^{-1}	.0001%
1.3	.750	1.083	1.083	.000%	1.78×10^{-1}	1.78×10^{-1}	.0000%
1.3	.800	1.074	1.074	.000%	1.68×10^{-1}	1.68×10^{-1}	.0000%
1.3	.850	1.065	1.065	.000%	1.59×10^{-1}	1.59×10^{-1}	.0000%
1.3	.900	1.057	1.057	.000%	1.51×10^{-1}	1.51×10^{-1}	.0000%
1.3	.950	1.049	1.049	.000%	1.43×10^{-1}	1.43×10^{-1}	.0000%
1.3	1.000	1.041	1.041	.000%	1.36×10^{-1}	1.36×10^{-1}	.0000%
1.3	1.500	.977	.977	.000%	8.23×10^{-2}	8.23×10^{-2}	.0000%
1.3	2.000	.928	.929	.108%	5.11×10^{-2}	5.11×10^{-2}	.0004%
1.3	2.500	.890	.890	.000%	3.25×10^{-2}	3.25×10^{-2}	.0000%
1.3	3.000	.858	.858	.000%	2.10×10^{-2}	2.10×10^{-2}	.0000%
1.3	3.500	.831	.831	.000%	1.38×10^{-2}	1.38×10^{-2}	.0000%
1.3	4.000	.808	.807	.124%	9.14×10^{-3}	9.14×10^{-3}	.0004%
1.3	4.500	.787	.787	.000%	6.13×10^{-3}	6.13×10^{-3}	.0000%
1.3	5.000	.769	.768	.130%	4.16×10^{-3}	4.16×10^{-3}	.0017%
1.3	6.000	.738	.737	.136%	1.96×10^{-3}	1.96×10^{-3}	.0018%
1.3	7.000	.712	.711	.140%	9.48×10^{-4}	9.48×10^{-4}	.0027%
1.3	8.000	.690	.689	.145%	4.70×10^{-4}	4.70×10^{-4}	.0029%
1.3	9.000	.671	.670	.149%	2.38×10^{-4}	2.38×10^{-4}	.0024%
1.3	10.000	.654	.654	.000%	1.23×10^{-4}	1.23×10^{-4}	.0000%
1.3	12.000	.626	.625	.160%	3.42×10^{-5}	3.42×10^{-5}	.0000%
1.3	14.000	.602	.602	.000%	1.00×10^{-5}	1.00×10^{-5}	.0000%
1.3	16.000	.582	.583	.172%	3.07×10^{-6}	3.07×10^{-6}	.0039%
1.3	18.000	.565	.566	.177%	9.76×10^{-7}	9.76×10^{-7}	.0059%
1.3	20.000	.550	.551	.182%	3.20×10^{-7}	3.20×10^{-7}	.0064%
1.3	22.000	.537	.538	.186%	1.08×10^{-7}	1.08×10^{-7}	.0118%
1.3	24.000	.525	.526	.190%	3.74×10^{-8}	3.73×10^{-8}	.0116%
1.3	26.000	.514	.515	.195%	1.32×10^{-8}	1.32×10^{-8}	.0083%
1.3	28.000	.504	.505	.198%	4.78×10^{-9}	4.78×10^{-9}	.0050%
1.3	30.000	.495	.496	.202%	1.76×10^{-9}	1.76×10^{-9}	.0054%
1.3	32.000	.487	.487	.000%	6.58×10^{-10}	6.58×10^{-10}	.0000%
1.3	34.000	.479	.479	.000%	2.51×10^{-10}	2.51×10^{-10}	.0000%
1.3	36.000	.472	.472	.000%	9.68×10^{-11}	9.68×10^{-11}	.0000%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 17

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.4	.001	1.280	1.280	.000%	4.28×10^{-1}	4.28×10^{-1}	.0000%
1.4	.002	1.280	1.283	.234%	4.28×10^{-1}	4.28×10^{-1}	.0010%
1.4	.003	1.280	1.279	.078%	4.27×10^{-1}	4.27×10^{-1}	.0000%
1.4	.004	1.279	1.278	.078%	4.27×10^{-1}	4.27×10^{-1}	.0002%
1.4	.006	1.278	1.277	.078%	4.26×10^{-1}	4.26×10^{-1}	.0002%
1.4	.008	1.278	1.276	.156%	4.25×10^{-1}	4.25×10^{-1}	.0003%
1.4	.010	1.277	1.276	.078%	4.23×10^{-1}	4.23×10^{-1}	.0001%
1.4	.015	1.275	1.274	.078%	4.21×10^{-1}	4.21×10^{-1}	.0000%
1.4	.020	1.273	1.272	.079%	4.18×10^{-1}	4.18×10^{-1}	.0000%
1.4	.025	1.271	1.270	.079%	4.15×10^{-1}	4.15×10^{-1}	.0000%
1.4	.030	1.269	1.267	.158%	4.13×10^{-1}	4.13×10^{-1}	.0003%
1.4	.035	1.267	1.265	.158%	4.10×10^{-1}	4.10×10^{-1}	.0004%
1.4	.040	1.265	1.263	.158%	4.08×10^{-1}	4.08×10^{-1}	.0004%
1.4	.045	1.263	1.261	.158%	4.05×10^{-1}	4.05×10^{-1}	.0004%
1.4	.050	1.261	1.259	.159%	4.02×10^{-1}	4.02×10^{-1}	.0005%
1.4	.055	1.259	1.257	.159%	4.00×10^{-1}	4.00×10^{-1}	.0005%
1.4	.060	1.257	1.255	.159%	3.97×10^{-1}	3.97×10^{-1}	.0006%
1.4	.065	1.255	1.253	.159%	3.95×10^{-1}	3.95×10^{-1}	.0007%
1.4	.070	1.253	1.251	.160%	3.92×10^{-1}	3.92×10^{-1}	.0008%
1.4	.075	1.252	1.249	.240%	3.90×10^{-1}	3.90×10^{-1}	.0009%
1.4	.080	1.250	1.247	.240%	3.88×10^{-1}	3.88×10^{-1}	.0010%
1.4	.085	1.248	1.245	.240%	3.85×10^{-1}	3.85×10^{-1}	.0012%
1.4	.090	1.246	1.243	.241%	3.83×10^{-1}	3.83×10^{-1}	.0014%
1.4	.095	1.244	1.241	.241%	3.80×10^{-1}	3.80×10^{-1}	.0016%
1.4	.100	1.243	1.239	.322%	3.78×10^{-1}	3.78×10^{-1}	.0018%
1.4	.150	1.226	1.222	.326%	3.55×10^{-1}	3.55×10^{-1}	.0021%
1.4	.200	1.210	1.206	.331%	3.34×10^{-1}	3.34×10^{-1}	.0026%
1.4	.250	1.195	1.191	.335%	3.15×10^{-1}	3.15×10^{-1}	.0034%
1.4	.300	1.182	1.178	.338%	2.97×10^{-1}	2.97×10^{-1}	.0026%
1.4	.350	1.169	1.165	.342%	2.80×10^{-1}	2.80×10^{-1}	.0029%
1.4	.400	1.157	1.153	.346%	2.64×10^{-1}	2.64×10^{-1}	.0029%
1.4	.450	1.145	1.142	.262%	2.49×10^{-1}	2.49×10^{-1}	.0023%
1.4	.500	1.134	1.131	.265%	2.35×10^{-1}	2.35×10^{-1}	.0027%
1.4	.550	1.124	1.121	.267%	2.23×10^{-1}	2.23×10^{-1}	.0023%
1.4	.600	1.114	1.112	.180%	2.10×10^{-1}	2.10×10^{-1}	.0013%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 18

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.4	.650	1.105	1.102	.271%	1.99×10^{-1}	1.99×10^{-1}	.0022%
1.4	.700	1.096	1.094	.182%	1.88×10^{-1}	1.88×10^{-1}	.0009%
1.4	.750	1.087	1.085	.184%	1.78×10^{-1}	1.78×10^{-1}	.0015%
1.4	.800	1.079	1.077	.185%	1.69×10^{-1}	1.69×10^{-1}	.0012%
1.4	.850	1.071	1.069	.187%	1.60×10^{-1}	1.60×10^{-1}	.0014%
1.4	.900	1.063	1.062	.094%	1.52×10^{-1}	1.52×10^{-1}	.0006%
1.4	.950	1.056	1.055	.095%	1.44×10^{-1}	1.44×10^{-1}	.0004%
1.4	1.000	1.049	1.048	.095%	1.37×10^{-1}	1.37×10^{-1}	.0004%
1.4	1.500	.989	.989	.000%	8.21×10^{-2}	8.21×10^{-2}	.0000%
1.4	2.000	.944	.944	.000%	5.07×10^{-2}	5.07×10^{-2}	.0000%
1.4	2.500	.908	.908	.000%	3.19×10^{-2}	3.19×10^{-2}	.0000%
1.4	3.000	.878	.878	.000%	2.04×10^{-2}	2.04×10^{-2}	.0000%
1.4	3.500	.852	.852	.000%	1.33×10^{-2}	1.33×10^{-2}	.0000%
1.4	4.000	.830	.830	.000%	8.70×10^{-3}	8.70×10^{-3}	.0000%
1.4	4.500	.810	.810	.000%	5.78×10^{-3}	5.78×10^{-3}	.0000%
1.4	5.000	.793	.792	.126%	3.87×10^{-3}	3.87×10^{-3}	.0009%
1.4	6.000	.763	.762	.131%	1.78×10^{-3}	1.78×10^{-3}	.0010%
1.4	7.000	.738	.737	.136%	8.40×10^{-4}	8.40×10^{-4}	.0007%
1.4	8.000	.716	.716	.000%	4.06×10^{-4}	4.06×10^{-4}	.0000%
1.4	9.000	.698	.697	.143%	2.00×10^{-4}	2.00×10^{-4}	.0000%
1.4	10.000	.681	.681	.000%	1.01×10^{-4}	1.01×10^{-4}	.0000%
1.4	12.000	.653	.653	.000%	2.65×10^{-5}	2.65×10^{-5}	.0000%
1.4	14.000	.630	.631	.159%	7.36×10^{-6}	7.36×10^{-6}	.0064%
1.4	16.000	.610	.611	.164%	2.13×10^{-6}	2.13×10^{-6}	.0031%
1.4	18.000	.593	.595	.337%	6.40×10^{-7}	6.40×10^{-7}	.0181%
1.4	20.000	.578	.580	.346%	1.98×10^{-7}	1.98×10^{-7}	.0166%
1.4	22.000	.565	.567	.354%	6.32×10^{-8}	6.32×10^{-8}	.0251%
1.4	24.000	.553	.555	.362%	2.07×10^{-8}	2.07×10^{-8}	.0227%
1.4	26.000	.543	.545	.368%	6.91×10^{-9}	6.90×10^{-9}	.0534%
1.4	28.000	.533	.535	.375%	2.36×10^{-9}	2.35×10^{-9}	.0495%
1.4	30.000	.524	.526	.382%	8.19×10^{-10}	8.19×10^{-10}	.0531%
1.4	32.000	.516	.517	.194%	2.90×10^{-10}	2.90×10^{-10}	.0236%
1.4	34.000	.508	.510	.394%	1.04×10^{-10}	1.04×10^{-10}	.0611%
1.4	36.000	.501	.502	.200%	3.80×10^{-11}	3.80×10^{-11}	.0232%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 19

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.5	.001	1.260	1.259	.079%	4.28×10^{-1}	4.28×10^{-1}	.0000%
1.5	.002	1.259	1.262	.238%	4.28×10^{-1}	4.28×10^{-1}	.0011%
1.5	.003	1.259	1.258	.079%	4.27×10^{-1}	4.27×10^{-1}	.0001%
1.5	.004	1.259	1.257	.159%	4.27×10^{-1}	4.27×10^{-1}	.0003%
1.5	.006	1.258	1.256	.159%	4.26×10^{-1}	4.26×10^{-1}	.0005%
1.5	.008	1.257	1.256	.080%	4.25×10^{-1}	4.25×10^{-1}	.0002%
1.5	.010	1.256	1.256	.000%	4.24×10^{-1}	4.24×10^{-1}	.0000%
1.5	.015	1.255	1.254	.080%	4.21×10^{-1}	4.21×10^{-1}	.0001%
1.5	.020	1.253	1.252	.080%	4.18×10^{-1}	4.18×10^{-1}	.0001%
1.5	.025	1.251	1.251	.000%	4.16×10^{-1}	4.16×10^{-1}	.0000%
1.5	.030	1.250	1.249	.080%	4.13×10^{-1}	4.13×10^{-1}	.0000%
1.5	.035	1.248	1.247	.080%	4.10×10^{-1}	4.10×10^{-1}	.0001%
1.5	.040	1.246	1.245	.080%	4.08×10^{-1}	4.08×10^{-1}	.0002%
1.5	.045	1.245	1.243	.161%	4.05×10^{-1}	4.05×10^{-1}	.0004%
1.5	.050	1.243	1.241	.161%	4.03×10^{-1}	4.03×10^{-1}	.0006%
1.5	.055	1.241	1.239	.161%	4.00×10^{-1}	4.00×10^{-1}	.0008%
1.5	.060	1.240	1.238	.161%	3.98×10^{-1}	3.98×10^{-1}	.0005%
1.5	.065	1.238	1.236	.162%	3.95×10^{-1}	3.95×10^{-1}	.0007%
1.5	.070	1.237	1.234	.243%	3.93×10^{-1}	3.93×10^{-1}	.0010%
1.5	.075	1.235	1.233	.162%	3.91×10^{-1}	3.91×10^{-1}	.0006%
1.5	.080	1.233	1.231	.162%	3.88×10^{-1}	3.88×10^{-1}	.0009%
1.5	.085	1.232	1.229	.244%	3.86×10^{-1}	3.86×10^{-1}	.0014%
1.5	.090	1.230	1.228	.163%	3.83×10^{-1}	3.83×10^{-1}	.0009%
1.5	.095	1.229	1.226	.244%	3.81×10^{-1}	3.81×10^{-1}	.0013%
1.5	.100	1.227	1.225	.163%	3.79×10^{-1}	3.79×10^{-1}	.0009%
1.5	.150	1.213	1.210	.247%	3.56×10^{-1}	3.56×10^{-1}	.0013%
1.5	.200	1.199	1.196	.250%	3.35×10^{-1}	3.35×10^{-1}	.0019%
1.5	.250	1.186	1.183	.253%	3.16×10^{-1}	3.16×10^{-1}	.0023%
1.5	.300	1.174	1.171	.256%	2.98×10^{-1}	2.98×10^{-1}	.0024%
1.5	.350	1.163	1.160	.258%	2.81×10^{-1}	2.81×10^{-1}	.0021%
1.5	.400	1.152	1.150	.174%	2.65×10^{-1}	2.65×10^{-1}	.0012%
1.5	.450	1.142	1.140	.175%	2.50×10^{-1}	2.50×10^{-1}	.0011%
1.5	.500	1.132	1.130	.177%	2.37×10^{-1}	2.37×10^{-1}	.0014%
1.5	.550	1.123	1.121	.178%	2.24×10^{-1}	2.24×10^{-1}	.0012%
1.5	.600	1.114	1.112	.180%	2.11×10^{-1}	2.11×10^{-1}	.0015%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 20

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.5	.650	1.106	1.104	.181%	2.00×10^{-1}	2.00×10^{-1}	.0009%
1.5	.700	1.098	1.096	.182%	1.89×10^{-1}	1.89×10^{-1}	.0008%
1.5	.750	1.090	1.088	.183%	1.79×10^{-1}	1.79×10^{-1}	.0011%
1.5	.800	1.082	1.081	.092%	1.70×10^{-1}	1.70×10^{-1}	.0006%
1.5	.850	1.075	1.074	.093%	1.61×10^{-1}	1.61×10^{-1}	.0005%
1.5	.900	1.068	1.067	.094%	1.52×10^{-1}	1.52×10^{-1}	.0005%
1.5	.950	1.061	1.060	.094%	1.45×10^{-1}	1.45×10^{-1}	.0007%
1.5	1.000	1.055	1.054	.095%	1.37×10^{-1}	1.37×10^{-1}	.0004%
1.5	1.500	1.000	1.000	.000%	8.21×10^{-2}	8.21×10^{-2}	.0000%
1.5	2.000	.958	.958	.000%	5.03×10^{-2}	5.03×10^{-2}	.0000%
1.5	2.500	.924	.924	.000%	3.15×10^{-2}	3.15×10^{-2}	.0000%
1.5	3.000	.895	.895	.000%	2.00×10^{-2}	2.00×10^{-2}	.0000%
1.5	3.500	.871	.870	.115%	1.28×10^{-2}	1.28×10^{-2}	.0001%
1.5	4.000	.849	.849	.000%	8.36×10^{-3}	8.36×10^{-3}	.0000%
1.5	4.500	.830	.830	.000%	5.49×10^{-3}	5.49×10^{-3}	.0000%
1.5	5.000	.814	.813	.123%	3.64×10^{-3}	3.64×10^{-3}	.0006%
1.5	6.000	.785	.784	.127%	1.64×10^{-3}	1.64×10^{-3}	.0008%
1.5	7.000	.760	.760	.000%	7.57×10^{-4}	7.57×10^{-4}	.0000%
1.5	8.000	.740	.739	.135%	3.58×10^{-4}	3.58×10^{-4}	.0003%
1.5	9.000	.721	.721	.000%	1.72×10^{-4}	1.72×10^{-4}	.0000%
1.5	12.000	.678	.678	.000%	2.12×10^{-5}	2.12×10^{-5}	.0000%
1.5	14.000	.655	.656	.153%	5.59×10^{-6}	5.59×10^{-6}	.0039%
1.5	16.000	.636	.637	.157%	1.54×10^{-6}	1.54×10^{-6}	.0079%
1.5	18.000	.619	.620	.162%	4.39×10^{-7}	4.39×10^{-7}	.0053%
1.5	20.000	.604	.606	.331%	1.29×10^{-7}	1.29×10^{-7}	.0174%
1.5	22.000	.591	.593	.338%	3.91×10^{-8}	3.91×10^{-8}	.0217%
1.5	24.000	.580	.581	.172%	1.21×10^{-8}	1.21×10^{-8}	.0165%
1.5	26.000	.569	.571	.351%	3.85×10^{-9}	3.84×10^{-9}	.0423%
1.5	28.000	.559	.561	.358%	1.24×10^{-9}	1.24×10^{-9}	.0347%
1.5	30.000	.550	.552	.364%	4.10×10^{-10}	4.10×10^{-10}	.0349%
1.5	32.000	.542	.544	.369%	1.38×10^{-10}	1.38×10^{-10}	.0508%
1.5	34.000	.534	.536	.375%	4.69×10^{-11}	4.69×10^{-11}	.0369%
1.5	36.000	.527	.529	.380%	1.62×10^{-11}	1.62×10^{-11}	.0481%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 21

BETA	T	F_{2M}	F_{2M*}	REL ERR	Z_{MAX}	Z_{MAX*}	REL ERR
1.6	.001	1.242	1.240	.161%	4.28×10^{-1}	4.28×10^{-1}	.0004%
1.6	.002	1.241	1.244	.242%	4.28×10^{-1}	4.28×10^{-1}	.0012%
1.6	.003	1.241	1.241	.000%	4.27×10^{-1}	4.27×10^{-1}	.0000%
1.6	.004	1.241	1.240	.081%	4.27×10^{-1}	4.27×10^{-1}	.0001%
1.6	.006	1.240	1.239	.081%	4.26×10^{-1}	4.26×10^{-1}	.0002%
1.6	.008	1.239	1.240	.081%	4.25×10^{-1}	4.25×10^{-1}	.0000%
1.6	.010	1.239	1.240	.081%	4.24×10^{-1}	4.24×10^{-1}	.0002%
1.6	.015	1.237	1.239	.162%	4.21×10^{-1}	4.21×10^{-1}	.0004%
1.6	.020	1.236	1.238	.162%	4.18×10^{-1}	4.18×10^{-1}	.0007%
1.6	.025	1.234	1.237	.243%	4.16×10^{-1}	4.16×10^{-1}	.0011%
1.6	.030	1.233	1.235	.162%	4.13×10^{-1}	4.13×10^{-1}	.0007%
1.6	.035	1.232	1.234	.162%	4.11×10^{-1}	4.11×10^{-1}	.0010%
1.6	.040	1.230	1.233	.244%	4.08×10^{-1}	4.08×10^{-1}	.0014%
1.6	.045	1.229	1.231	.163%	4.06×10^{-1}	4.06×10^{-1}	.0009%
1.6	.050	1.227	1.230	.244%	4.03×10^{-1}	4.03×10^{-1}	.0012%
1.6	.055	1.226	1.228	.163%	4.01×10^{-1}	4.01×10^{-1}	.0008%
1.6	.060	1.225	1.227	.163%	3.98×10^{-1}	3.98×10^{-1}	.0010%
1.6	.065	1.223	1.226	.245%	3.96×10^{-1}	3.96×10^{-1}	.0014%
1.6	.070	1.222	1.224	.164%	3.93×10^{-1}	3.93×10^{-1}	.0009%
1.6	.075	1.220	1.223	.246%	3.91×10^{-1}	3.91×10^{-1}	.0012%
1.6	.080	1.219	1.222	.246%	3.89×10^{-1}	3.89×10^{-1}	.0015%
1.6	.085	1.218	1.220	.164%	3.86×10^{-1}	3.86×10^{-1}	.0009%
1.6	.090	1.216	1.219	.247%	3.84×10^{-1}	3.84×10^{-1}	.0012%
1.6	.095	1.215	1.218	.247%	3.82×10^{-1}	3.82×10^{-1}	.0016%
1.6	.100	1.214	1.217	.247%	3.79×10^{-1}	3.79×10^{-1}	.0019%
1.6	.150	1.201	1.204	.250%	3.57×10^{-1}	3.57×10^{-1}	.0017%
1.6	.200	1.189	1.192	.252%	3.36×10^{-1}	3.36×10^{-1}	.0017%
1.6	.250	1.178	1.181	.255%	3.17×10^{-1}	3.17×10^{-1}	.0021%
1.6	.300	1.167	1.170	.257%	2.99×10^{-1}	2.99×10^{-1}	.0016%
1.6	.350	1.157	1.160	.259%	2.82×10^{-1}	2.82×10^{-1}	.0018%
1.6	.400	1.148	1.150	.174%	2.66×10^{-1}	2.66×10^{-1}	.0014%
1.6	.450	1.139	1.141	.176%	2.52×10^{-1}	2.52×10^{-1}	.0016%
1.6	.500	1.130	1.132	.177%	2.38×10^{-1}	2.38×10^{-1}	.0013%
1.6	.550	1.122	1.124	.178%	2.25×10^{-1}	2.25×10^{-1}	.0018%
1.6	.600	1.114	1.116	.180%	2.12×10^{-1}	2.12×10^{-1}	.0018%

TABLE A: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 22

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
1.6	.650	1.106	1.108	.181%	2.01×10^{-1}	2.01×10^{-1}	.0015%
1.6	.700	1.099	1.101	.182%	1.90×10^{-1}	1.90×10^{-1}	.0020%
1.6	.750	1.091	1.094	.275%	1.80×10^{-1}	1.80×10^{-1}	.0023%
1.6	.800	1.085	1.087	.184%	1.71×10^{-1}	1.71×10^{-1}	.0021%
1.6	.850	1.078	1.080	.186%	1.62×10^{-1}	1.62×10^{-1}	.0015%
1.6	.900	1.072	1.074	.187%	1.53×10^{-1}	1.53×10^{-1}	.0022%
1.6	.950	1.065	1.068	.292%	1.45×10^{-1}	1.45×10^{-1}	.0025%
1.6	1.000	1.060	1.062	.189%	1.38×10^{-1}	1.38×10^{-1}	.0025%
1.6	1.500	1.009	1.010	.099%	8.21×10^{-2}	8.21×10^{-2}	.0010%
1.6	2.000	.969	.970	.103%	5.01×10^{-2}	5.01×10^{-2}	.0006%
1.6	2.500	.937	.938	.107%	3.11×10^{-2}	3.11×10^{-2}	.0010%
1.6	3.000	.910	.910	.000%	1.96×10^{-2}	1.96×10^{-2}	.0000%
1.6	3.500	.887	.887	.000%	1.25×10^{-2}	1.25×10^{-2}	.0000%
1.6	4.000	.866	.866	.000%	8.08×10^{-3}	8.08×10^{-3}	.0000%
1.6	4.500	.848	.848	.000%	5.26×10^{-3}	5.26×10^{-3}	.0000%
1.6	5.000	.832	.832	.000%	3.46×10^{-3}	3.46×10^{-3}	.0000%
1.6	6.000	.804	.804	.000%	1.53×10^{-3}	1.53×10^{-3}	.0000%
1.6	7.000	.781	.780	.128%	6.91×10^{-4}	6.91×10^{-4}	.0011%
1.6	8.000	.761	.760	.131%	3.20×10^{-4}	3.20×10^{-4}	.0001%
1.6	9.000	.743	.742	.135%	1.51×10^{-4}	1.51×10^{-4}	.0020%
1.6	10.000	.727	.726	.138%	7.24×10^{-5}	7.24×10^{-5}	.0043%
1.6	12.000	.700	.700	.000%	1.74×10^{-5}	1.74×10^{-5}	.0000%
1.6	14.000	.678	.677	.147%	4.38×10^{-6}	4.38×10^{-6}	.0057%
1.6	16.000	.659	.658	.152%	1.15×10^{-6}	1.15×10^{-6}	.0072%
1.6	18.000	.643	.642	.156%	3.13×10^{-7}	3.13×10^{-7}	.0025%
1.6	20.000	.628	.627	.159%	8.79×10^{-8}	8.79×10^{-8}	.0106%
1.6	22.000	.615	.614	.163%	2.54×10^{-8}	2.54×10^{-8}	.0134%
1.6	24.000	.604	.602	.331%	7.49×10^{-9}	7.49×10^{-9}	.0255%
1.6	26.000	.593	.592	.169%	2.26×10^{-9}	2.26×10^{-9}	.0131%
1.6	28.000	.584	.582	.342%	6.98×10^{-10}	6.98×10^{-10}	.0224%
1.6	30.000	.575	.573	.348%	2.19×10^{-10}	2.19×10^{-10}	.0305%
1.6	32.000	.566	.564	.353%	7.01×10^{-11}	7.00×10^{-11}	.0737%
1.6	34.000	.559	.556	.537%	2.27×10^{-11}	2.27×10^{-11}	.1090%
1.6	36.000	.552	.549	.543%	7.49×10^{-12}	7.49×10^{-12}	.1068%

TABLE B

SUMMARY OF ACCURACY OF APPROXIMATION OF $Z_{\max}$

β	Maximum Observed Relative Error in Estimation of $Z_{\max}$ by $Z_{\max}^*$
.6	.0646 %
.7	.0116 %
.8	.1103 %
.9	.1745 %
1.0	.3141 %
1.1	.2638 %
1.2	.0799 %
1.3	.0118 %
1.4	.0611 %
1.5	.0508 %
1.6	.1090 %

TABLE C: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 1

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.833	.010	1.500	1.494	.400%	4.22×10^{-1}	4.22×10^{-1}	.0010%
.833	.015	1.492	1.490	.134%	4.19×10^{-1}	4.19×10^{-1}	.0001%
.833	.020	1.484	1.484	.000%	4.16×10^{-1}	4.16×10^{-1}	.0000%
.833	.025	1.477	1.477	.000%	4.13×10^{-1}	4.13×10^{-1}	.0000%
.833	.030	1.470	1.470	.000%	4.10×10^{-1}	4.10×10^{-1}	.0000%
.833	.035	1.462	1.463	.068%	4.07×10^{-1}	4.07×10^{-1}	.0000%
.833	.040	1.456	1.456	.000%	4.04×10^{-1}	4.04×10^{-1}	.0000%
.833	.045	1.449	1.449	.000%	4.01×10^{-1}	4.01×10^{-1}	.0000%
.833	.050	1.442	1.442	.000%	3.98×10^{-1}	3.98×10^{-1}	.0000%
.833	.055	1.436	1.435	.070%	3.95×10^{-1}	3.95×10^{-1}	.0000%
.833	.060	1.429	1.428	.070%	3.93×10^{-1}	3.93×10^{-1}	.0001%
.833	.065	1.423	1.421	.141%	3.90×10^{-1}	3.90×10^{-1}	.0002%
.833	.070	1.417	1.415	.141%	3.87×10^{-1}	3.87×10^{-1}	.0001%
.833	.075	1.411	1.408	.213%	3.84×10^{-1}	3.84×10^{-1}	.0003%
.833	.080	1.405	1.402	.214%	3.82×10^{-1}	3.82×10^{-1}	.0004%
.833	.085	1.399	1.396	.214%	3.79×10^{-1}	3.79×10^{-1}	.0004%
.833	.090	1.393	1.390	.215%	3.76×10^{-1}	3.76×10^{-1}	.0005%
.833	.095	1.388	1.384	.288%	3.74×10^{-1}	3.74×10^{-1}	.0007%
.833	.100	1.382	1.378	.289%	3.71×10^{-1}	3.71×10^{-1}	.0009%
.833	.150	1.332	1.327	.375%	3.47×10^{-1}	3.47×10^{-1}	.0015%
.833	.200	1.289	1.283	.465%	3.25×10^{-1}	3.25×10^{-1}	.0025%
.833	.300	1.219	1.213	.492%	2.87×10^{-1}	2.87×10^{-1}	.0024%
.833	.350	1.189	1.184	.421%	2.70×10^{-1}	2.70×10^{-1}	.0020%
.833	.400	1.162	1.158	.344%	2.54×10^{-1}	2.54×10^{-1}	.0014%
.833	.450	1.137	1.134	.264%	2.40×10^{-1}	2.40×10^{-1}	.0011%
.833	.500	1.115	1.112	.269%	2.27×10^{-1}	2.27×10^{-1}	.0009%
.833	.550	1.094	1.092	.183%	2.15×10^{-1}	2.15×10^{-1}	.0005%
.833	.600	1.075	1.073	.186%	2.04×10^{-1}	2.04×10^{-1}	.0004%

Preceding page blank

TABLE C: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 2

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.833	.650	1.057	1.056	.095%	1.93×10^{-1}	1.93×10^{-1}	.0001%
.833	.700	1.040	1.039	.096%	1.83×10^{-1}	1.83×10^{-1}	.0001%
.833	.750	1.024	1.024	.000%	1.74×10^{-1}	1.74×10^{-1}	.0000%
.833	.800	1.009	1.009	.000%	1.65×10^{-1}	1.65×10^{-1}	.0000%
.833	.900	.982	.983	.102%	1.50×10^{-1}	1.50×10^{-1}	.0001%
.833	.950	.970	.970	.000%	1.43×10^{-1}	1.43×10^{-1}	.0000%
.833	1.000	.958	.959	.104%	1.36×10^{-1}	1.36×10^{-1}	.0003%
.833	1.500	.863	.865	.232%	8.63×10^{-2}	8.63×10^{-2}	.0007%
.833	2.000	.798	.798	.000%	5.70×10^{-2}	5.70×10^{-2}	.0000%
.833	2.500	.748	.748	.000%	3.88×10^{-2}	3.88×10^{-2}	.0000%
.833	3.000	.709	.708	.141%	2.69×10^{-2}	2.69×10^{-2}	.0002%
.833	3.500	.676	.675	.148%	1.91×10^{-2}	1.91×10^{-2}	.0011%
.833	4.000	.649	.647	.308%	1.37×10^{-2}	1.37×10^{-2}	.0029%
.833	4.500	.625	.623	.320%	9.96×10^{-3}	9.96×10^{-3}	.0052%
.833	5.000	.605	.602	.496%	7.32×10^{-3}	7.32×10^{-3}	.0081%
.833	6.000	.570	.568	.351%	4.07×10^{-3}	4.07×10^{-3}	.0065%
.833	7.000	.542	.540	.369%	2.34×10^{-3}	2.34×10^{-3}	.0073%
.833	8.000	.518	.517	.193%	1.38×10^{-3}	1.38×10^{-3}	.0045%
.833	9.000	.498	.497	.201%	8.27×10^{-4}	8.27×10^{-4}	.0050%
.833	10.000	.481	.480	.208%	5.07×10^{-4}	5.07×10^{-4}	.0033%
.833	12.000	.452	.452	.000%	2.00×10^{-4}	2.00×10^{-4}	.0000%
.833	14.000	.429	.429	.000%	8.28×10^{-5}	8.28×10^{-5}	.0000%
.833	16.000	.409	.410	.244%	3.58×10^{-5}	3.58×10^{-5}	.0011%
.833	18.000	.393	.394	.254%	1.61×10^{-5}	1.61×10^{-5}	.0073%
.833	20.000	.379	.380	.264%	7.43×10^{-6}	7.43×10^{-6}	.0118%
.833	22.000	.366	.367	.273%	3.53×10^{-6}	3.53×10^{-6}	.0046%
.833	24.000	.355	.356	.282%	1.72×10^{-6}	1.72×10^{-6}	.0065%
.833	26.000	.345	.346	.290%	8.52×10^{-7}	8.52×10^{-7}	.0055%
.833	28.000	.336	.336	.000%	4.31×10^{-7}	4.31×10^{-7}	.0000%
.833	30.000	.328	.327	.305%	2.22×10^{-7}	2.22×10^{-7}	.0161%

TABLE C: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 3

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.875	.010	1.472	1.468	.272%	4.23×10^{-1}	4.23×10^{-1}	.0006%
.875	.015	1.465	1.464	.068%	4.19×10^{-1}	4.19×10^{-1}	.0000%
.875	.020	1.458	1.459	.069%	4.16×10^{-1}	4.16×10^{-1}	.0000%
.875	.025	1.452	1.453	.069%	4.13×10^{-1}	4.13×10^{-1}	.0000%
.875	.030	1.446	1.447	.069%	4.10×10^{-1}	4.10×10^{-1}	.0001%
.875	.035	1.439	1.441	.139%	4.07×10^{-1}	4.07×10^{-1}	.0001%
.875	.040	1.433	1.434	.070%	4.05×10^{-1}	4.05×10^{-1}	.0000%
.875	.045	1.427	1.428	.070%	4.02×10^{-1}	4.02×10^{-1}	.0000%
.875	.050	1.421	1.422	.070%	3.99×10^{-1}	3.99×10^{-1}	.0000%
.875	.055	1.415	1.416	.071%	3.96×10^{-1}	3.96×10^{-1}	.0000%
.875	.060	1.410	1.410	.000%	3.93×10^{-1}	3.93×10^{-1}	.0000%
.875	.065	1.404	1.404	.000%	3.90×10^{-1}	3.90×10^{-1}	.0000%
.875	.070	1.399	1.398	.071%	3.88×10^{-1}	3.88×10^{-1}	.0000%
.875	.075	1.393	1.392	.072%	3.85×10^{-1}	3.85×10^{-1}	.0001%
.875	.080	1.388	1.367	.072%	3.82×10^{-1}	3.82×10^{-1}	.0000%
.875	.085	1.383	1.381	.145%	3.80×10^{-1}	3.80×10^{-1}	.0001%
.875	.090	1.378	1.376	.145%	3.77×10^{-1}	3.77×10^{-1}	.0001%
.875	.095	1.373	1.371	.146%	3.75×10^{-1}	3.75×10^{-1}	.0001%
.875	.100	1.368	1.365	.219%	3.72×10^{-1}	3.72×10^{-1}	.0004%
.875	.150	1.322	1.319	.227%	3.48×10^{-1}	3.48×10^{-1}	.0006%
.875	.200	1.283	1.279	.312%	3.26×10^{-1}	3.26×10^{-1}	.0011%
.875	.250	1.248	1.244	.321%	3.06×10^{-1}	3.06×10^{-1}	.0014%
.875	.300	1.214	1.214	.000%	2.88×10^{-1}	2.88×10^{-1}	.0000%
.875	.350	1.190	1.187	.252%	2.71×10^{-1}	2.71×10^{-1}	.0007%
.875	.400	1.164	1.162	.172%	2.55×10^{-1}	2.55×10^{-1}	.0006%
.875	.450	1.141	1.140	.088%	2.41×10^{-1}	2.41×10^{-1}	.0002%
.875	.500	1.120	1.119	.089%	2.28×10^{-1}	2.28×10^{-1}	.0001%
.875	.550	1.100	1.100	.000%	2.16×10^{-1}	2.16×10^{-1}	.0000%
.875	.600	1.082	1.082	.000%	2.04×10^{-1}	2.04×10^{-1}	.0000%

TABLE C: APPROXIMATIONS OF F_{2M} AND Z_{MAX} AND THEIR RELATIVE ERRORS

SHEET 4

BETA	T	F_{2M}	F_{2M}^*	REL ERR	Z_{MAX}	Z_{MAX}^*	REL ERR
.875	.650	1.065	1.065	.000%	1.93×10^{-1}	1.93×10^{-1}	.0000%
.875	.700	1.049	1.050	.095%	1.83×10^{-1}	1.83×10^{-1}	.0001%
.875	.750	1.034	1.035	.097%	1.74×10^{-1}	1.74×10^{-1}	.0002%
.875	.800	1.020	1.021	.098%	1.65×10^{-1}	1.65×10^{-1}	.0002%
.875	.850	1.006	1.008	.199%	1.57×10^{-1}	1.57×10^{-1}	.0004%
.875	.900	.994	.995	.101%	1.50×10^{-1}	1.50×10^{-1}	.0003%
.875	.950	.982	.983	.102%	1.42×10^{-1}	1.42×10^{-1}	.0004%
.875	1.000	.970	.972	.206%	1.36×10^{-1}	1.36×10^{-1}	.0007%
.875	1.500	.879	.881	.228%	8.55×10^{-2}	8.55×10^{-2}	.0014%
.875	2.000	.815	.816	.123%	5.61×10^{-2}	5.61×10^{-2}	.0007%
.875	2.500	.766	.767	.131%	3.78×10^{-2}	3.78×10^{-2}	.0006%
.875	3.000	.727	.727	.000%	2.60×10^{-2}	2.60×10^{-2}	.0000%
.875	3.500	.695	.694	.144%	1.82×10^{-2}	1.82×10^{-2}	.0009%
.875	4.000	.668	.667	.150%	1.30×10^{-2}	1.30×10^{-2}	.0008%
.875	4.500	.644	.643	.155%	9.34×10^{-3}	9.34×10^{-3}	.0022%
.875	5.000	.624	.622	.321%	6.81×10^{-3}	6.81×10^{-3}	.0051%
.875	6.000	.590	.587	.508%	3.71×10^{-3}	3.71×10^{-3}	.0101%
.875	7.000	.561	.559	.357%	2.09×10^{-3}	2.09×10^{-3}	.0116%
.875	8.000	.538	.536	.372%	1.21×10^{-3}	1.21×10^{-3}	.0089%
.875	9.000	.518	.516	.386%	7.11×10^{-4}	7.11×10^{-4}	.0092%
.875	10.000	.500	.499	.200%	4.28×10^{-4}	4.28×10^{-4}	.0053%
.875	12.000	.471	.471	.000%	1.62×10^{-4}	1.62×10^{-4}	.0000%
.875	14.000	.448	.448	.000%	6.47×10^{-5}	6.47×10^{-5}	.0000%
.875	16.000	.428	.429	.234%	2.70×10^{-5}	2.70×10^{-5}	.0046%
.875	18.000	.411	.412	.243%	1.17×10^{-5}	1.17×10^{-5}	.0011%
.875	20.000	.397	.398	.252%	5.19×10^{-6}	5.19×10^{-6}	.0077%
.875	22.000	.384	.385	.260%	2.38×10^{-6}	2.38×10^{-6}	.0033%
.875	24.000	.373	.374	.268%	1.12×10^{-6}	1.12×10^{-6}	.0086%
.875	26.000	.363	.363	.000%	5.34×10^{-7}	5.34×10^{-7}	.0000%
.875	28.000	.354	.353	.282%	2.61×10^{-7}	2.61×10^{-7}	.0072%
.875	30.000	.345	.344	.290%	1.30×10^{-7}	1.30×10^{-7}	.0252%

REFERENCES

1. Biological Defense Research Laboratories, Dugway, Utah, 84022. Approximations of Downwind Distance for a Given Threat from an Elevated Line Source: I. Domain of Inverse Relationship Between F_0 and Z for Restricted Values of β and Values of T of Thirty or Less, by Michael J. Evans. Technical Memorandum BDRL-TM-72-001, June 1972. UNCLASSIFIED

2.