REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	October 1995	Professional Paper

4. TITLE AND SUBTITLE

AN APPROXIMATE METHOD FOR MODELING VEGETATION EFFECTS OVER TERRAIN

5. FUNDING NUMBERS

PR: MPB1
PE: 0602435N
WU: DN302214

6. AUTHOR(S)

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7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Naval Command, Control and Ocean Surveillance Center (NCCOSC)
RDT&E Division
San Diego, CA 92152–5001

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

This paper describes a simple method implemented in a terrain split-step parabolic equation model (TPEM) that can model radiowave fields over terrain in which the ground is modified to approximate the vegetation.

~~Published in *Proceedings of URSI-National Radio Science Meeting*, p. 65, January 3, 1995.~~

14. SUBJECT TERMS

Terrain Split-Step Parabolic Equation Model (TPEM)
Ground Elevation
Terrain Path

15. NUMBER OF PAGES

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	SAME AS REPORT

21a. NAME OF RESPONSIBLE INDIVIDUAL	21b. TELEPHONE *(include Area Code)*	21c. OFFICE SYMBOL
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AN APPROXIMATE METHOD FOR MODELING VEGETATION EFFECTS OVER TERRAIN

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There are currently several models that have been validated that can model radiowave fields over terrain (R.J. Luebbers, *IEEE Ant. and Prop.*, 951-955, 1984, S. Ayasli, *IEEE Ant. and Prop.*, 1013-1023, 1986, A.E. Barrios, *IEEE Ant. and Prop.*, 90-98, 1994). While these models perform adequately when the terrain path is absent of any major vegetation such as trees and large brush, they fail to adequately account for the increased attenuation observed when vegetation is present.

A simple method, implemented in a terrain split-step parabolic equation model (TPEM), is presented in which the ground is modified to approximate the vegetation. The method consists of simply increasing the ground elevation by the height of the intervening trees or brush. This method is particularly useful when the topography of the terrain path is poorly described, in which case the ground elevation can then be adjusted by an average value along the entire path.

An example is shown below in which fields were measured over a 6 km long terrain path at a frequency of 910 MHz (K.A. Chamberlin, R.J. Luebbers, *IEEE Ant. and Prop.*, 1093-1098, 1982). Signals were measured under two conditions, one in which the terrain path was clear, and one in which a grove of trees blocked the propagation path.