MASTER OF SCIENCE
IN
ENGINEERING ACOUSTICS

JAVA-BASED IMPLEMENTATION OF MONTEREY-MIAMI PARABOLIC EQUATION (MMPE) MODEL WITH ENHANCED VISUALIZATION AND IMPROVED METHOD OF ENVIRONMENTAL DEFINITION

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The Monterey-Miami Parabolic Equation (MMPE) Model is a full-wave underwater acoustic propagation model that utilizes the split-step Fourier marching algorithm. Previously the MMPE model was implemented in Fortran language and ran with a simple command line interface either in a Unix or DOS command window. After the Fortran code was run, the resulting binary data output file was post-processed using Matlab routines to extract specific field data and present the results in graphical form. This approach requires the user to have installed both Matlab and Fortran compilers. The MMPE model and associated acoustic processing tools are now rewritten in the object-oriented language Java. This new version of the MMPE model built within a Windows framework is called WinMMPE. Integrating the model, the post-processing calculations and the graphics generation together with a graphic user interface has produced a more attractive tool for users. A user-friendly, efficient, and accurate full-wave acoustic propagation model with enhanced visualization can make it easier to assess the spatial transmission loss in underwater acoustic environment.

DoD KEY TECHNOLOGY AREA: Modeling and Simulation

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