

**PACKAGE ID** - 001294GENWS00 EM3D

**KWIC TITLE** - Models the Electromagnetic Response of a 3D  
Distribution of Conductivity

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**LIMITATION CODE** -COPY                   **AUDIENCE CODE** - LIM

**COMPLETION DATE** - 09/30/1998   **PUBLICATION DATE** - 09/30/1998

**DESCRIPTION** - EM3D models the electromagnetic response of a 3D distribution of conductivity, dielectric permittivity and magnetic permeability within the earth for geophysical applications. The simulations are carried out in the frequency domain for either electric or magnetic sources for either scattered or total field formulations of Maxwell's equations. The solution is based on the method of finite differences and includes absorbing boundary conditions so that responses can be modeled up into the radar range where wave propagation is dominant. Recent upgrades in the software include the incorporation of finite size sources, that in addition to dipolar source fields, and a low induction number preconditioner that can significantly reduce computational run times. A graphical user interface (GUI) is bundled with the software so that complicated 3D models can be easily constructed and simulated with the software. The GUI also allows for plotting of the output.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; Demonstration of Program EM3D Version 1.0; Media Includes Source Code;

**SOURCE CODE INCLUDED?** - Yes

**MEDIA QUANTITY** - 1 3.5 Diskette

**METHOD OF SOLUTION** - The solution is based on the method of finite differences and employs preconditioned iterative Krylov subspace techniques to solve the resulting linear system of equations.

**COMPUTER** - WORK STATION

**OPERATING SYSTEMS** - Unix

**PROGRAMMING LANGUAGES** - Fortran 77

**SOFTWARE LIMITATIONS** - Mesh employed in finite difference to Fortran 77 or higher compilers.

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**SOFTWARE LIMITATIONS - (CONT)**

**SOURCE CODE AVAILABLE (Y/N)** - Y

**RELATED SOFTWARE** - Update of 3D EM MOD

**ABSTRACT STATUS** - Released AS-IS 3/15/1999

**SUBJECT CLASS CODE** - Z

**KEYWORDS** -

COMPUTER PROGRAM DOCUMENTATION  
E CODES  
FINITE DIFFERENCE METHOD  
SIMULATION  
COMPUTERIZED SIMULATION  
MAXWELL EQUATIONS

**EDB SUBJECT CATEGORIES** -

990200

**SPONSOR** - DOE/DP

**PACKAGE TYPE** - AS - IS