

**PACKAGE ID** - 001300MLTPL00 E3D

**KWIC TITLE** - 3D Elastic Seismic Wave Propagation Code

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**LIMITATION CODE** -UNL                   **AUDIENCE CODE** - UNL

**COMPLETION DATE** - 01/01/1998   **PUBLICATION DATE** - 01/01/1998

**DESCRIPTION** - E3D is capable of simulating seismic wave propagation in a 3D heterogeneous earth. Seismic waves are initiated by earthquake, explosive, and/or other sources. These waves propagate through a 3D geologic model, and are simulated as synthetic seismograms or other graphical output.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; Readme files (3 pages); Media Includes Source Code, User's Guide, Program Description, Compilation Instructions, Linking Instructions, Sample Problem Input Data;

**SOURCE CODE INCLUDED?** - Yes

**MEDIA QUANTITY** - 1 CD Rom

**METHOD OF SOLUTION** - The software simulates wave propagation by solving the elastodynamic formulation of the full wave equation on a staggered grid. The solution scheme is 4th-order space, 2nd-order time explicit finite difference.

**COMPUTER** - MLT-PLTFM

**OPERATING SYSTEMS** - UNIX

**PROGRAMMING LANGUAGES** - C (95%) FORTRAN (5%)

**SOFTWARE LIMITATIONS** - Memory and available CPU time are limiting factors.

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**SOFTWARE LIMITATIONS - (CONT)**

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

**UNIQUE FEATURES** - E3D has a number of advanced features. These include:  
seismic wave simulation capability in 2D/3D inhomogeneous  
material; absorbing boundary conditions; free-surface boundary  
conditions; attenuation and topographic model in (2D);  
hybridization; multiple source characterization; 3D model input;  
multiple and massively parallel platform implementation; run-time  
visualization.

**RELATED SOFTWARE** - There are a number of auxiliary routines that are  
used with E3D to process input and output data.

**HARDWARE REQs** - UNIX platform. Memory size, CPU usage, and disk space  
are problem dependent.

**TIME REQUIREMENTS** - Time requirements are highly model dependent. Small  
models can run in seconds on a desktop UNIX workstation. Large  
models require many hours on a high performance or parallel  
computer system. The largest model run to date required 10 hours on  
a 40-node dual processor Meiko CS-2.

**SUBJECT CLASS CODE** - Z

**KEYWORDS** -

COMPUTER PROGRAM DOCUMENTATION  
E CODES  
WAVE PROPAGATION  
DATA  
EARTHQUAKES  
EXPLOSIONS

**EDB SUBJECT CATEGORIES** -  
990200

**SPONSOR** - DOE/DP

**PACKAGE TYPE** - AS - IS