PACKAGE ID - 000576MNFRM00 GRIDMAKER

KWIC TITLE - Grid Generator for Two, Three-dimensional Finite Element Subsurface Flow Models

AUTHORS - Tsay, T.K.
Syracuse University, NY (United States)

Yeh, G.T.
Pennsylvania State University, College Station (United States)

Wilson, G.V.
University of Tennessee, Knoxville (United States)

Toran, L.E.
Oak Ridge National Lab., TN (United States)

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

COMPLETION DATE - 06/01/1990 **PUBLICATION DATE -** 06/01/1990

DESCRIPTION - GRIDMAKER serves as a preprocessor for finite element models in solving two- and three-dimensional subsurface flow and pollutant transport problems. It is designed to generate three-point triangular or four-point quadrilateral elements for two-dimensional domains and eight-point hexahedron elements for three-dimensional domains. A two-dimensional domain of an aquifer with a variable depth layer is treated as a special case for depth-integrated two-dimensional, finite element subsurface flow models. The program accommodates the need for aquifers with heterogeneous systems by identifying the type of material in each element.

PACKAGE CONTENTS - Media Directory; Software Abstract; ORNL-6613; Media Includes Source Code, Sample Problem Input Data;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 5.25 Diskette

METHOD OF SOLUTION - Based on the method of conformal mapping, the generation of interior nodal points within the two-dimensional domain of interest is performed numerically by the boundary integral element method (BIEM). For a three-dimensional domain, the BIEM techniques are applied in the projected horizontal plane, while the vertical coordinate is transformed by a normalized transformation using local layer thickness.

COMPUTER - MAINFRAMES

OPERATING SYSTEMS - VAX/VMS

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PROGRAMMING LANGUAGES - FORTRAN 77

SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - GRIDMAKER generates grids for groundwater models and has capability for flexible geometry grids.

RELATED SOFTWARE - FEWA and 3DFEMWATER are groundwater modeling codes which have been used with GRIDMAKER.

OTHER PROG/OPER SYS INFO - Mouse option is currently available. Slight mapping errors are present. Input grid boundaries slightly off from output and boundaries. Program uses a multiple implied do list in some of its output statements. Depending on the compiler used, these three statements may have to be changed to work. The logic is straightforward, the only potential problem is with the single line statement format.

HARDWARE REQS - None specific to code in current dimensioning.

TIME REQUIREMENTS - Most problems run in seconds to minutes.

REFERENCES - T.K. Tsay, G.T. Yeh, G.V. Wilson, and L.E. Toran 'GRIDMAKER: A Grid Generator for Two- and Three-dimensional Finite Element Subsurface Flow Models' ORNL-6613, June 1990.

ABSTRACT STATUS - Submitted April 1993. Released screened September 16, 1993.

SUBJECT CLASS CODE - HRL

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
G CODES
FLOW MODELS
GROUND WATER
POLLUTANTS
UNDERGROUND SPACE

EDB SUBJECT CATEGORIES -
990200 420400 540210

SPONSOR - DOE/EH

PACKAGE TYPE - SCREENED