PACKAGE ID - 000406IBMPC00 HYFRACP3D

KWIC TITLE - Finite Element Code For 3D-Hydraulic Fracture Propagation Equations (3-layer).

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

COMPLETION DATE - 05/01/1985 **PUBLICATION DATE -** 05/01/1985

DESCRIPTION - HYFRACP3D is a finite element program for simulation of a pseudo three-dimensional fracture geometries with a two-dimensional planar solution. The model predicts the height, width and winglength over time for a hydraulic fracture propagating in a three-layered system of rocks with variable rock mechanics properties.

PACKAGE CONTENTS - Media Directory; Software Abstract; User's Guide; Media Includes Source Code, Sample Problem Input and Output;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 3.5 Diskette

METHOD OF SOLUTION - The program uses the finite element of solution. The model employs a numerical approach to solve the coupled non-linear partial differential equations for the fracture fluid pressure and induced fracture dimensions. The fracture is discretized into a number of vertical sections. Fracture width and pressure evaluations are conducted by applying to each vertical crack, the two-dimensional flow in the vertical direction with leak-off.

COMPUTER - IBM PC

OPERATING SYSTEMS - DOS

PROGRAMMING LANGUAGES - FORTRAN 77

SOFTWARE LIMITATIONS - Graphics output is not available and program is limited to fracture propagation in a single plane without proppant transport. For PC use, the input is either typed onto the screen in

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SOFTWARE LIMITATIONS -(CONT) program format if output is sent to a file, or output is printed to screen if input is read from a file.

SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - The program simulates the propagation of a three-dimensional hydraulic fracture due to constant injection rates. The program is capable of simulating the influences of variations in three rock layers, in situ stresses, mechanical properties and thicknesses.

OTHER PROG/OPER SYS INFO - File extensions of 'FOR' refer to FORTRAN source code. File extensions of 'INP' refer to FORTRAN source code data input files. File extensions of 'OUT' refer to FORTRAN source code output files.

HARDWARE REQS - IBM compatible PC, 156456 bytes free disk space.

TIME REQUIREMENTS - Approximate execution time is 5 CPU minutes.

REFERENCES - S.H. Advani, J.K. Lee, and T.S. Lee, Development of a Generalized Hydraulic Fracture Model, May 1985.

ABSTRACT STATUS - Abstract submitted March 1992. IBM PC version submitted May 1985.

SUBJECT CLASS CODE - HRI

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
H CODES
HYDRAULIC FRACTURING
ROCKS
THREE-DIMENSIONAL CALCULATIONS
COMPUTERIZED SIMULATION
CRACKS
DESIGN
FLUID INJECTION PROCESSES
FLUID MECHANICS
FRACTURE MECHANICS
RESERVOIR ENGINEERING
ROCK MECHANICS
ROCK-FLUID INTERACTIONS
STRESS INTENSITY FACTORS
WELL STIMULATION

EDB SUBJECT CATEGORIES -
990200 420400 360603 580000 020300 030300

SPONSOR - DOE/MET

PACKAGE TYPE - SCREENED