

PACKAGE ID - 000714C760000 HEMP

KWIC TITLE - Hydrodynamic Elastic Magneto Plastic

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

COMPLETION DATE - 02/01/1985 **PUBLICATION DATE** - 02/01/1985

DESCRIPTION - The HEMP code solves the conservation equations of two-dimensional elastic-plastic flow, in plane x-y coordinates or in cylindrical symmetry around the x-axis. Provisions for calculation of fixed boundaries, free surfaces, pistons, and boundary slide planes have been included, along with other special conditions.

PACKAGE CONTENTS - Media Directory; Software Abstract; UCRL-7322, Rev.1; UCRL-51079 Rev. 1; Media Includes Source Deck, Sample Problem;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 CD Rom

METHOD OF SOLUTION - The solution is by the method of finite differences and uses the Lagrangian formulation. The materials within a physical system are divided into quadrilaterals bounded by J and K grid lines. A decoupling of grid lines is allowed along K-lines, and voids may open and close between K-lines.

COMPUTER - CDC7600

OPERATING SYSTEMS - SCOPE 2.1

PROGRAMMING LANGUAGES - FORTRAN IV; LLL CHAT compiler

SOFTWARE LIMITATIONS - The maximum number of J's in any K-line is 101. A problem of up to about 10,000 zones may be run.

SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - The input system, described in the HEMP User's Manual is designed so that the least amount of data to describe a particular physical system need be supplied. However, provision is made for describing initial conditions (zonal or nodal) in great detail, if required.

OTHER PROG/OPER SYS INFO - Memory must be precleared to zero. The program treats LCM as an input-output storage device. Data is

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OTHER PROG/OPER SYS INFO - (CONT) accessed to and from LCM in K-line groups. The dimensions of variables in LCM numbered COMMON blocks must be adjusted for each problem.

HARDWARE REQS - The HEMP main code fills the small core memory (SCM) with the code, working storage, library, and system routines. The large core memory (LCM) utilized is a function of problem size, the amount required is 527,270 (octal) words.

TIME REQUIREMENTS - Basic HEMP calculation speed is about 5 points (or zones) per millisecond. The number of problem cycles necessary depends on the problem termination time and the time-step size. Typical problems run from a few minutes to several hours with time a function of zone size, material composition and activity in the zones.

REFERENCES - | Mark L. Wilkins, Calculation of Elastic Plastic Flow, UCRL-7322, Rev. 1, January 24, 1969. | E. D. Giroux, HEMP User's Manual, UCRL-51079, Rev. 1, December 17, 1973.

SUBJECT CLASS CODE - HQ

KEYWORDS -

COMPUTER PROGRAM DOCUMENTATION
H CODES
ELASTICITY
PLASTICITY
FLUID FLOW
EQUATIONS OF STATE
FINITE DIFFERENCE METHOD
LAGRANGE EQUATIONS
FLUID MECHANICS

EDB SUBJECT CATEGORIES -
990200 420400

SPONSOR - DOE/DP

PACKAGE TYPE - AS - IS