

PACKAGE ID - 000669C017600 DOT-BPMD

KWIC TITLE - Nonlinear Heat Transfer 2d Structure

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

COMPLETION DATE - 09/01/1987 **PUBLICATION DATE** - 04/01/1983

DESCRIPTION - DOT-BPMD is a general-purpose, finite-element, heat-transfer program used to predict thermal environments. The code considers linear and nonlinear transient or steady-state heat conduction in two-dimensional planar or axisymmetric representations of structures. Capabilities are provided for modeling anisotropic heterogeneous materials with temperature-dependent thermal properties and time-dependent temperature, heat flux, convection and radiation boundary conditions, together with time-dependent internal heat generation. DOT-BPMD may be used in the evaluation of steady-state geothermal gradients as well as in the transient heat conduction analysis of repository and waste package subsystems. Strengths of DOT-BPMD include its ability to account for a wide range of possible boundary conditions, nonlinear material properties, and its efficient equation solution algorithm. Limitations include the lack of a three-dimensional analysis capability, no radiative or convective internal heat transfer, and the need to maintain a constant time-step in each program execution.

PACKAGE CONTENTS - Media Directory; Software Abstract; ONWI-420; Media Includes Source Code, Sample Problem Input and Output, Auxiliary Information;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 CD Rom

COMPUTER - CDC CYBER176

OPERATING SYSTEMS - NOS 1.4

PROGRAMMING LANGUAGES - FORTRAN IV

SOURCE CODE AVAILABLE (Y/N) - Y

RELATED SOFTWARE - DOE-BPMD can also be used to generate temperature distributions to be used as input to the SCEPTER thermomechanical codes VISCOT, MATLOC, and UTAH2. In the analysis of the waste package, DOT-BPMD can be used to calculate temperatures for input to the WAPPA, waste package performance assessment, program.

HARDWARE REQS - 64K words

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TIME REQUIREMENTS - Sample problems execution times ranged from 1 CP second to 25 CP minutes on a CDC CYBER170/740.

REFERENCES - INTERA Environmental Consultants, Inc., DOT: A Nonlinear Heat-Transfer Code for Analysis of Two-Dimensional Planar and Axisymmetric Representations of Structures, ONWI-420, April 1983.

ABSTRACT STATUS - Abstract first distributed July 1984. CDC CYBER176 version submitted May 1984, distribution limitation removed October 1986.

SUBJECT CLASS CODE - RH

KEYWORDS -

COMPUTER PROGRAM DOCUMENTATION
D CODES
HEAT TRANSFER
RADIOACTIVE WASTE STORAGE
TEMPERATURE DEPENDENCE
FINITE ELEMENT METHOD
NONLINEAR PROBLEMS
TRANSIENTS
STEADY-STATE CONDITIONS

EDB SUBJECT CATEGORIES -

990200 052002 420400

SPONSOR - DOE/NE

PACKAGE TYPE - AS - IS