PACKAGE ID - 001208IBMPC00 QUENCH2D*

KWIC TITLE - Two-Dimensional IHCP Code

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LIMITATION CODE -COPY **AUDIENCE CODE -** LIM

COMPLETION DATE - 02/20/1998 **PUBLICATION DATE -** 01/01/1995

DESCRIPTION - QUENCH2D* is developed for the solution of general, non-linear, two-dimensional inverse heat transfer problems. This program provides estimates for the surface heat flux distribution and/or heat transfer coefficient as a function of time and space by using transient temperature measurements at appropriate interior points inside the quenched body. Two-dimensional planar and axisymmetric geometries such as turnbine disks and blades, clutch packs, and many other problems can be analyzed using QUENCH2D*.

PACKAGE CONTENTS - Media Directory; Software Abstract; User's Manual; Media Includes Source Code, Executables;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 3.5 Diskette

METHOD OF SOLUTION - The combined function specification and regularization method is used for the solution of the inverse problem. In QUENCH2D*, a sequential in time estimation procedure is used for the solution of the inverse problem. This sequential in time procedure uses a quasi-linear approximation in the calculations of temperatures and sensitivity coefficients. The finite elememt program TOPAZ2D* (VAX/VMS version, January 1996) of Lawrence Livermore National Laboratory was modified into a direct problem solver subroutine for the calculations of the temperatures and the sensitivity coefficients.

COMPUTER - IBM PC

OPERATING SYSTEMS - Windows

PROGRAMMING LANGUAGES - MS FORTRAN 5.1

SOFTWARE LIMITATIONS -

SOURCE CODE AVAILABLE (Y/N) - Y

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UNIQUE FEATURES - Direct estimation of heat transfer coefficient h versus time and position. Update QUENCH2D to treatment of hollow disks. Adding the restart capability feature. QUENCH2D will provide the user with dump file contains table of temperatures at a specified sequence of times. Allows for number of future times, r, to be function of time. Allows for jumps in the h or q values at the corners. New additional output files with format provided by Ladish Company. Allows for the regularization parameter to be function of time. Terminates execution of QUENCH2D if temperatures are unphysically too high or too low.

RELATED SOFTWARE - TOPAZ2D

REFERENCES - Arafa M. Osman and James V. Beck, QUENCH2D A Two-dimensional IHCP Code for Estimation of Surface Heat Fluxes and Heat Transfer Coefficients, User's Manual, MSU-ENGR-008-95, 1995.

ABSTRACT STATUS - Released AS-IS 4/22/1998

SUBJECT CLASS CODE - HW

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
Q CODES
HEAT TRANSFER
BOUNDARY CONDITIONS
THERMAL STRESSES
ELECTROSTATICS
MAGNETIC FIELDS
FINITE ELEMENT METHOD
SOLIDS
CHEMICAL REACTION KINETICS
ELECTRIC FIELDS
ELECTROMAGNETIC FIELDS

EDB SUBJECT CATEGORIES -
420400 990200 661100

SPONSOR - DOE/ER

PACKAGE TYPE - AS - IS