PACKAGE ID - 000189MLTPL00 NIKE2D96*

KWIC TITLE - Static & Dynamic Response of 2D Solids

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

COMPLETION DATE - 06/01/1996 **PUBLICATION DATE -** 01/24/1992

DESCRIPTION - NIKE2D is an implicit finite-element code for analyzing the finite deformation, static and dynamic response of two-dimensional, axisymmetric, plane strain, and plane stress solids. The code is fully vectorized and available on several computing platforms. A number of material models are incorporated to simulate a wide range of material behavior including elasto-placicity, anisotropy, creep, thermal effects, and rate dependence. Slideline algorithms model gaps and sliding along material interfaces, including interface friction, penetration and single surface contact. Interactive-graphics and rezoning is included for analyses with large mesh distortions. In addition to quasi-Newton and arc-length procedures, adaptive algorithms can be defined to solve the implicit equations using the solution language ISLAND. Each of these capabilities and more make NIKE2D a robust analysis tool.

PACKAGE CONTENTS - Media Directory; Software Abstract; Installation Guides for SUN, IBM, and SGI; New Features in the MDG Codes; UCRL-MA-105413; UCRL-MA-108721; Media Includes Source Code, Compilation Instructions, Linking Instructions;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 CD ROM

METHOD OF SOLUTION - The governing solid mechanics equations of motion and momentum conservation are solved using the finite element method. Namely, physical objects are spatially discretized using quadrilateral elements to represent the displacement fields. Spatial differentiation of these fields yields elemental strains, and temporal discretization gives velocities. Combining the element formulations with appropriate material constitutive theories and the equations of momentum, a weak form of the governing equations is semidiscretized. Thus, a coupled system of ordinary differential equations are constructed which are then solved using quasi-Newton and other numerical methods.

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METHOD OF SOLUTION -(CONT)
COMPUTER - MLT-PLTFM

OPERATING SYSTEMS - UNIX, VMS

PROGRAMMING LANGUAGES - FORTRAN

SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - A wide range of material behaviors, several unique slideline contact algorithms, interactive rezoning and a programmable solution language called ISLAND.

RELATED SOFTWARE - MAZE and ORION

OTHER PROG/OPER SYS INFO - The DIGLIB code is included in this package. This package has three new material models and new slideline algorithms.

REFERENCES - B. Engelmann, J.O. Hallquist, NIKE2D A Nonlinear, Implicit, Two-Dimensional Finite Element Code for Solid Mechanics, User Manual, UCRL-MA-105413, April 1991; B.E. Engelmann and R.G. Whirley, ISLAND: Interactive Solution Language for an Adaptive NIKE Driver, User Manual, UCRL-MA-108721, October 1991.

ABSTRACT STATUS - Submitted July 1996. Released screened 8/7/96

SUBJECT CLASS CODE - I

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
N CODES
STRESS ANALYSIS
SOLIDS
NONLINEAR PROBLEMS
FINITE ELEMENT METHOD
STRUCTURAL MODELS
DYNAMIC LOADS
DEFORMATION
STATIC LOADS
CREEP
PLASTICITY
ELASTICITY

EDB SUBJECT CATEGORIES -
990200 420200

SPONSOR - DOE/DP

PACKAGE TYPE - SCREENED