PACKAGE ID - 000185SUN0000 RIPPLE

KWIC TITLE - Fluid Dynamics with Free Surfaces

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

COMPLETION DATE - 06/12/1991 **PUBLICATION DATE -** 02/03/1992

DESCRIPTION - RIPPLE is a two-dimensional, transient, free surface incompressible fluid dynamics program. It allows multiple free surfaces with surface tension and wall adhesion forces and has a partial cell treatment which allows curved boundaries and interior obstacles.

PACKAGE CONTENTS - Reading the RIPPLE Disk (Includes Directory, 4 Pages); Software Abstract; Media includes Source Code, User's Manual (LA-12007-MS, Sample Problem, Auxiliary Material, Control Information;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 CD-ROM

METHOD OF SOLUTION - RIPPLE simulates incompressible flows with free surfaces using the volume-of-fluid (VOF) algorithm. This technique is based on the use of donor-acceptor differencing to track the free surface across an Eulerian grid. The complete Navier-Stokes equations in primitive variables for an incompressible fluid are solved by finite differences with surface tension and wall adhesion included. Optionally the pressure equation can be solved by a conjugate residual method rather than the successive overrelaxation (SOR) method.

COMPUTER - SUN

OPERATING SYSTEMS - UNIX

PROGRAMMING LANGUAGES - FORTRAN77, C

SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - RIPPLE is highly structured so that individual components may be easily modified to fit specific problem requirements or to accept subsequent code upgrades.

OTHER PROG/OPER SYS INFO - RIPPLE contains calls to several system-dependent plotting routines and a time limit routine. These are not included, and users must supply their own equivalent routines. RIPPLE can run many problems without modification, but a specific application may require changes to the logic for special

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OTHER PROG/OPER SYS INFO -(CONT) inflow or outflow ports, complicated geometries, or unusual conditions. These are accomplished by using the UPDATE utility.

HARDWARE REQS - 3 units in addition to the standard input/output units. 144,000 words of memory are required for execution on a Cray X-MP.

REFERENCES - Martin D. Torrey, Douglas B. Kothe, Raymond C. Mjolsness, RIPPLE : A Computer Program for Incompressible Flows with Free Surfaces, LA-12007-MS, April 1991.

ABSTRACT STATUS - Abstract first distributed August 1991.

SUBJECT CLASS CODE - H

KEYWORDS -
COMPUTER PROGRAM DOCUMENTATION
R CODES
INCOMPRESSIBLE FLOW
SURFACES
SURFACE TENSION
TRANSIENTS
NAVIER-STOKES EQUATIONS

EDB SUBJECT CATEGORIES -
990200 420400

SPONSOR - DOE/DP; NASA

PACKAGE TYPE - AS - IS