

PACKAGE ID - 001259MLTPL00 BREAKUP

KWIC TITLE - Prepares Overset Grids for Processing

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

COMPLETION DATE - 02/01/1996 **PUBLICATION DATE** - 02/01/1996

DESCRIPTION - Many large and complex computational problems require multiple, structured, generically overlapped (overset) grids to obtain numerical solutions in a timely manner. BREAKUP significantly reduces required compute times by preparing overset grids for processing on massively parallel computers. BREAKUP subdivides the original grids for use on a user-specified number of parallel processors. Grid-to-grid and intragrid communications are maintained in the parallel environment via connectivity tables generated by BREAKUP. The subgrids are formed to be statically load balanced and to incur a minimum of communication between the subgrids. When the output of BREAKUP is submitted to an appropriately modified flow solver, subgrid solutions will be updated simultaneously. This contrasts to the much less efficient solution method of updating each original grid sequentially as done in the past.

PACKAGE CONTENTS - Media Directory; Software Abstract; Media Includes Source Code, Compilation Instructions, User's Guide, Sample Problem Input Data;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 CD Rom

METHOD OF SOLUTION - Overset grids are divided into a user-specified number of subgrids for obtaining computational field simulations on massively parallel computers. The divided grids are statically load balanced for parallel efficiency and constructed to minimize message passing.

COMPUTER - MLT-PLTFM

OPERATING SYSTEMS - This software can run on any computer or OS for which a Fortran 77 compatible compiler has been written.

PROGRAMMING LANGUAGES - Fortran 77

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SOFTWARE LIMITATIONS - None within the program's scope.

SOURCE CODE AVAILABLE (Y/N) - Y

RELATED SOFTWARE - The following are auxiliary software needed to provide data to or analyze and use data from BREAKUP. Code to generate interpolation coefficients for grid-to-grid communication; author uses the following: N.E. Suhs and R.W. Tramel, PEGSUS 4.0 User's Manual, AEDC-TR-91-8, Calspan Corporation/AEDC Operations, Arnold AFB, Tennessee, USA. Flow solver modified by user for message passing on parallel computers. Graphics program which can read PLOT3D-formatted output; author uses the following: TECPLOT, Amtec Engineering, Inc., P.O. Box 3633, Bellevue, WA 98009-3633

HARDWARE REQS - Required computer memory depends upon the size of the largest single overset grid. This is known by the user before running the BREAKUP code.

REFERENCES - A User's Guide for BREAKUP: A Computer Code for Parallelizing the Overset Grid Approach

ABSTRACT STATUS - Released AS IS 11/23/98

SUBJECT CLASS CODE - Z

KEYWORDS -

COMPUTER PROGRAM DOCUMENTATION
B CODES
DATA

EDB SUBJECT CATEGORIES -
990200

SPONSOR - DOE/DP

PACKAGE TYPE - AS - IS