

PACKAGE ID - 001130MLTPL00 AZTEC

KWIC TITLE - Parallel Iterative method Software for Solving
Linear Systems

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

COMPLETION DATE - 08/01/1995 **PUBLICATION DATE** - 07/01/1995

DESCRIPTION - AZTEC is an interactive library that greatly simplifies the parallelization process when solving the linear systems of equations $Ax=b$ where A is a user supplied $n \times n$ sparse matrix, b is a user supplied vector of length n and x is a vector of length n to be computed. AZTEC is intended as a software tool for users who want to avoid cumbersome parallel programming details but who have large sparse linear systems which require an efficiently utilized parallel processing system. A collection of data transformation tools are provided that allow for easy creation of distributed sparse unstructured matrices for parallel solutions.

PACKAGE CONTENTS - Media Directory; Software Abstract; SAND95-1540J; SAND95-1559; Media Includes Source Code, Data Library;

SOURCE CODE INCLUDED? - Yes

MEDIA QUANTITY - 1 CD Rom

METHOD OF SOLUTION - To solve systems of equations AZTEC includes a number of Krylov iterative methods: conjugate gradient (CG), generalized minimum residual (GMRES), conjugate gradient squared (CGS), stabilized biconjugate gradient (BiCGSTAB) and a quasi-minimum residual method based on the CGS algorithm (QMRCGS). These Krylov methods are used in conjunction with a number of preconditioners: Jacobi, block Jacobi, Jacobi-Gauss-Seidel, Jacobi-symmetric-Gauss-Seidel, domain decomposition using direct solvers or incomplete factorizations within subdomains and polynomial preconditioners.

COMPUTER - MLT-PLTFM

OPERATING SYSTEMS - Unix

PROGRAMMING LANGUAGES - ANSI C (95%) Fortran 77 (5%)

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SOURCE CODE AVAILABLE (Y/N) - Y

UNIQUE FEATURES - Aztec's principal unique feature is its' ability to simply and efficiently handle unstructured matrices (e.g. from finite elements) in a parallel environment.

RELATED SOFTWARE - None

HARDWARE REQS - The only hardware requirement is that AZTEC be run on one of the following: Sun workstation, SGI workstations, nCUBE 2, and Intel Paragon.

TIME REQUIREMENTS - Problem dependent

REFERENCES - Ray S Tuminaro, John N Shadid, and Scott A. Hutchinson, Parallel Sparse Matrix-Vector Multiply Software for Matrices with Data Locality, SAND95-1540J, July 1995; Scott A. Hutchinson, John N. Shadid, and Ray S. Tuminaro, Aztec User's Guide Version 1.0, SAND95-1559, July 1995.

ABSTRACT STATUS - Submitted 12/4/96. Released AS-IS 12/23/96.

SUBJECT CLASS CODE - P

KEYWORDS -

COMPUTER PROGRAM DOCUMENTATION
A CODES
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EQUATIONS
ITERATIVE METHODS
PARALLEL PROCESSING
COMPUTER CALCULATIONS
MANUALS
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EDB SUBJECT CATEGORIES -
990200

SPONSOR - DOE/DP

PACKAGE TYPE - AS - IS