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**Parallel iterative methods for sparse linear systems.** (English) Zbl 1002.65042

Butnariu, Dan (ed.) et al., Inherently parallel algorithms in feasibility and optimization and their applications. Research workshop, Haifa, Israel, March 13-16, 2000. Amsterdam: North-Holland/ Elsevier. Stud. Comput. Math. 8, 423-440 (2001).

Summary: This paper presents an overview of parallel algorithms and their implementations for solving large sparse linear systems which arise in scientific and engineering applications. Preconditioners constitute the most important ingredient in solving such systems. As will be seen, the most common preconditioners used for sparse linear systems adapt domain decomposition concepts to the more general framework of “distributed sparse linear systems”. Variants of Schwarz procedures and Schur complement techniques are discussed. We also report on our own experience in the parallel implementation of a fairly complex simulation of solid-liquid flows.

For the entire collection see [[Zbl 0971.00058](#)].

**MSC:**

- [65F10](#) Iterative numerical methods for linear systems
- [65F35](#) Numerical computation of matrix norms, conditioning, scaling
- [76T99](#) Multiphase and multicomponent flows
- [65F50](#) Computational methods for sparse matrices
- [65Y05](#) Parallel numerical computation
- [65N55](#) Multigrid methods; domain decomposition for boundary value problems involving PDEs

Cited in **1336** Documents

**Keywords:**

preconditioners; parallel algorithms; large sparse linear systems; domain decomposition; Schwarz procedures; Schur complement techniques; simulation of solid-liquid flows

**Software:**

AztecOO; BlockSolve95; ParPre; PETSc; P-SPARSLIB; SPARSKIT