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High performance preconditioning. (English) Zbl 0693.65027

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The paper deals with the parallel solution of linear algebraic systems with special matrices arising from the discretization of elliptic partial differential equations. To solve the resulting algebraic systems preconditioned conjugate gradient methods are considered. The role of the preconditioner is to reduce the number of iteration steps in parallel implementation. The methods proposed are well suited for supercomputers possessing vector facilities. The approaches presented are compared by solving the three-dimensional problem of the size $34 \times 34 \times 34$ on a CYBER-205 vector machine.

Reviewer: [M. Vajteršić](#)

MSC:

- [65F10](#) Iterative numerical methods for linear systems
- [65F35](#) Numerical computation of matrix norms, conditioning, scaling
- [65Y05](#) Parallel numerical computation
- [65N22](#) Numerical solution of discretized equations for boundary value problems involving PDEs
- [35J25](#) Boundary value problems for second-order elliptic equations

Cited in **2** Reviews
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[preconditioning](#); [vector parallel computers](#); [preconditioned conjugate gradient methods](#); [preconditioner](#); [parallel implementation](#); [supercomputers](#)

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