

## A PARALLEL MULTIGRID METHOD USING THE FULL DOMAIN PARTITION\*

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**Abstract.** The combination of adaptive refinement, multigrid and parallel computing for solving partial differential equations is considered. In the full domain partition approach, each processor contains a partition of the grid plus the minimum number of additional coarse elements required to cover the whole domain. A parallel multigrid algorithm using the full domain partition is presented. Multigrid rates of convergence have been observed while communicating between processors only twice per V-cycle. Numerical computations on a network of up to 32 workstations show that parallel efficiency rates of 50% to 90% can be obtained.

**Key words.** grid partitioning, multigrid, parallel algorithms.

**AMS subject classifications.** 65N30, 65N55, 65Y05, 65N50.

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