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NON-STATIONARY PARALLEL MULTISPLITTING AOR METHODS*

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Abstract. Non-stationary parallel multisplitting iterative methods based on the AOR method are studied for the solution of nonsingular linear systems. Convergence of the synchronous and asynchronous versions of these methods is studied for H–matrices. Furthermore, computational results about these methods on both shared and distributed memory multiprocessors are discussed. The numerical examples presented cover the non-stationary parallel multisplitting Gauss-Seidel and SOR methods applied to the solution of the linear system yielded by a finite difference discretization of the two-dimensional Laplace's equation on a rectangular domain under Dirichlet boundary conditions. These results show that non-stationary AOR-type methods (synchronous and asynchronous) are better than the corresponding standard parallel multisplitting AOR method. Moreover, asynchronous versions always behave better than the synchronous ones.

Key words. non-stationary multisplitting methods, AOR method, asynchronous algorithms, H–matrices, parallel implementation, shared memory, distributed memory.

AMS subject classification. 65F10.

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