

ON THE PERFORMANCE OF THE ALGEBRAIC OPTIMIZED SCHWARZ PRECONDITIONING METHODS

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The Algebraic Optimized Schwarz Methods (AOSM) have been introduced in [1]. These methods mimic in the algebraic form the well-known optimized Schwarz methods (OMS). The AOSM methods are based on the modification of the block matrices associated to the transmission conditions between sub-domains. The transmission blocks are replaced by modified blocks to improve the convergence of the corresponding methods. In the optimal case, the convergence can be achieved in two iterations. We are interested in how the algebraic optimized Schwarz methods, used as preconditioner solvers, perform in solving partial differential equations. We are also interested in their asymptotic behavior with respect to change in problems parameters. We will present different numerical simulations corresponding to different type of problems in two- and three-dimensions.

References

- [1] Martin J. Gander and Sébastien Loisel and Daniel B. Szyld, *An optimal block iterative method and preconditioner for banded matrices with applications to PDEs on irregular domains*, Research Report 10-05-21, Department of Mathematics, Temple University, May 2010