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A MULTIGRID METHOD FOR SADDLE POINT PROBLEMS ARISING FROM MORTAR FINITE ELEMENT DISCRETIZATIONS*

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Abstract. A multigrid algorithm for saddle point problems arising from mortar finite element discretizations is analyzed. Here, we do not require that the constraints at the interface are satisfied in each smoothing step, but we work on the squared system. Using mesh dependent norms for the Lagrange multipliers, suitable approximation and smoothing properties are established. A convergence rate independent of the meshsize is obtained for the $\mathcal{W}$–cycle.

Key words. mortar finite elements, saddle point problems, multigrid methods.

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