

CASCADIC MULTIGRID PRECONDITIONER FOR ELLIPTIC EQUATIONS WITH JUMP COEFFICIENTS*

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Abstract. This paper provides a proof of robustness of the cascadic multigrid preconditioner for the linear finite element approximation of second order elliptic problems with strongly discontinuous coefficients. As a result, we prove that the convergence rate of the conjugate gradient method with cascadic multigrid preconditioner is uniform with respect to large jumps and mesh sizes.

Key words. Jump coefficients, conjugate gradient, condition number, cascadic multigrid.

AMS subject classifications. 65N30, 65N55, 65F10.

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