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Multigrid Preconditioner for Nonconforming Discretization of Elliptic Problems with Jump Coefficients

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In this paper, we present a multigrid preconditioner for solving the linear system arising from the piecewise linear nonconforming Crouzeix-Raviart discretization of second order elliptic problems with jump coefficients. The preconditioner uses the standard conforming subspaces as coarse spaces. Numerical tests show both robustness with respect to the jump in the coefficient and near-optimality with respect to the number of degrees of freedom.

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