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MULTIGRID METHODS FOR A BIHARMONIC PROBLEM

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We develop multigrid algorithms for a quadratic C^0 interior penalty method for a biharmonic problem with essential and natural boundary conditions of the Cahn-Hilliard type. A multigrid solve for the Poisson problem with homogeneous Neumann boundary condition is used as a preconditioner in the smoothing steps for the fourth order problem, which significantly improves the performance of the multigrid methods. Numerical results are presented.