

AN ITERATIVE SUBSTRUCTURING ALGORITHM FOR A C^0 INTERIOR PENALTY METHOD*

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Abstract. We study an iterative substructuring algorithm for a C^0 interior penalty method for the biharmonic problem. This algorithm is based on a Bramble-Pasciak-Schatz preconditioner. The condition number of the preconditioned Schur complement operator is shown to be bounded by $C \left(1 + \ln\left(\frac{H}{h}\right)\right)^2$, where h is the mesh size of the triangulation, H represents the typical diameter of the nonoverlapping subdomains, and the positive constant C is independent of h , H , and the number of subdomains. Corroborating numerical results are also presented.

Key words. biharmonic problem, iterative substructuring, domain decomposition, C^0 interior penalty methods, discontinuous Galerkin methods

AMS subject classification. 65N55, 65N30

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