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 $C\left(1 + \ln(\frac{H}{h})\right)^2$, 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

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