

CONSTRUCTION OF PRECONDITIONERS BY USING HIGH-ORDER MINIMUM ENERGY BASIS

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In this work we propose some strategies for constructing preconditioners for the high-order Finite Element Method (FEM) using minimum energy bases. These techniques are applied to the solution of the Helmholtz equation in $2D$ and $3D$ structured meshes. For the construction of the minimum energy basis, the internal modes are made simultaneously diagonal. The boundary modes are changed to result in one-dimensional Helmholtz diagonal block matrices. The performance is investigated using the conjugate gradient method and compared with standard diagonal preconditioner.

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