A unified mortar condition for nonconforming finite elements.

Summary: A continuously interpolated mortar condition is proposed for 2D and 3D $P_k$ nonconforming finite elements on nonmatching grids. The resulting finite element method is an optimal order one in solving elliptic equations. Numerical tests on the 2D $P_1$, 2D $P_2$ and 3D $P_1$ nonconforming finite elements are provided.

Keywords: mass-preserving interpolation; nonconforming element; continuously interpolated mortar condition; interface coupling; nonmatching grid

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