The Mortar Method in the Wavelet Context*

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Abstract

This paper deals with the use of wavelets in the framework of the Mortar method.

We first review in an abstract framework the theory of the Mortar Method for non conforming domain decomposition, and point out some basic assumptions under which stability and convergence of such method can be proven. We study the application of the Mortar Method in the biorthogonal wavelet framework. In particular we define suitable multiplier spaces for imposing weak continuity. Unlike in the classical mortar method, such multiplier spaces are not a subset of the space of traces of interior functions, but rather of their duals.

For the resulting method, we provide with an error estimate, which is optimal in the geometrically conforming case. We also study an almost diagonal preconditioner based on using wavelet preconditioners as building blocks in a substructuring approach.

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