Semi-Uniform Multigrid (SUMG) Algorithms for Interface Problems

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ABSTRACT

We develop a new type of multigrid method for interface problems based on the semi-uniform grids, which is obtained by refinement of the uniform grid. The algorithms is based on the subspace correction concept. First, the residual at the semi-uniform grids are restricted to the uniform grid system and then V-cycle multigrid algorithms are solved on the uniform grid system. We provide the contracting analysis of the proposed algorithms and present numerical results supporting the algorithms.