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Discretization-Accuracy Convergence for Full Algebraic Multigrid

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Full multigrid (FMG) is well known for converging to the level of discretization accuracy in a single cycle on a wide class of partial differential equations when the multigrid hierarchy is derived from problem geometry. When applying an FMG cycle to a hierarchy generated by algebraic multigrid (AMG), however, this scalable convergence to discretization accuracy may be lost. This paper examines the cause of this phenomenon and explores some improvements to standard AMG interpolation which can restore single cycle convergence to discretization accuracy.