

Multiple right-hand-side implementation for $DD\alpha$ AMG

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We present a multiple right-hand side (rhs) implementation of the Adaptive Aggregation-based Domain Decomposition Multigrid method ($DD\alpha$ AMG) using twisted mass fermions.

Our implementation extends the strong scaling region of $DD\alpha$ AMG and simplifies vectorization, which would otherwise require using vector extensions. This multiple rhs implementation is thus better suited to take advantage of current and emerging HPC trends, which involve increasing core counts per node and more diverse CPU architectures, such as ARM, Intel Xeon, and AMD Epyc.

In this talk, we will describe our implementation strategy and show preliminary scaling results. Moreover, we will show preliminary results obtained using Block Krylov solvers as complementary preconditioners within $DD\alpha$ AMG, as provided by the Fast Accurate Block Linear krylOv Solver (Fabulous) library.

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