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Application of Adaptive Multigrid Algorithm in Hybrid Monte Carlo Simulations

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Lattice QCD has entered the era of simulations directly at the physical quark masses thanks to the increasing computing power and algorithmic advancement. But the computational cost for such simulations is still extremely high, both for the gauge field generation and the measurements of physical observables. Adaptive multi grid (MG) algorithm has proven to be quite effective in reducing the computational cost in measurements with Wilson-type fermions, provided that many measurements are performed on one gauge configuration due to the high setup cost for MG. We explore the feasibility of applying the multi grid algorithm in the hybrid Monte Carlo simulations with Wilson fermions, and show some preliminary results.

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