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Effects of FTHMC with 2+1 Domain Wall Fermions on Autocorrelation Times via Master-Field Technique

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Field-Transformed Hybrid Monte-Carlo (FTHMC) algorithm potentially mitigates the issue of critical slowing down by combining HMC with a field transformation, originally proposed by Luscher and motivated as trivializing the theory. For the transformation, we use an invertible discrete smearing step modelled on the Wilson flow and applied it to the system with Iwasaki gauge fields and 2+1 Domain-Wall fermions. We have studied its effect of different smearing parameter values on autocorrelation times of Wilson-flowed energies with different flow time. We have found a reduction of exponential autocorrelation times for infra-red observables

such as Wilson flowed energy densities and topological charge densities when larger value of the smearing parameter is used. In determination of autocorrelation times, autocorrelation times of local observables are computed using a new approach akin to master-field technique, allowing us to estimate the effect of FT with different parameters based on a small number of configurations.

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