QCD simulations using polynomial-filtered multiple-time-scale molecular dynamics HMC

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Abstract: The use of low-order polynomial approximations to the inverse as a filter to extract the high frequency modes in the molecular dynamics of HMC is described. By introducing multiple time-steps in the integration, the step-size for the most computationally expensive force terms in dynamical QCD simulations can be increased substantially. The method is tested in QCD on realistic lattice sizes at light Wilson quark masses.