

Exploring the HMC trajectory-length dependence of autocorrelation times in lattice QCD

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Abstract: We study autocorrelation times of physical observables in lattice QCD as a function of the molecular dynamics trajectory length in the hybrid Monte-Carlo algorithm. In an interval of trajectory lengths where energy and reversibility violations can be kept under control, we find a variation of the integrated autocorrelation times by a factor of about two in the quantities of interest. Trajectories longer than conventionally used are found to be superior both in the $N_f = 0$ and $N_f = 2$ examples considered here. We also provide evidence that they lead to faster thermalization of systems with light quarks.