

Testing Topology Conserving Gauge Actions for Lattice QCD

Presenter: Kei-ichi Nagai

W. Bietenholz, K. Jansen, K.-I. Nagai, S. Necco, L. Scorzato, S. Shcheredin

Abstract: We explore gauge actions for lattice QCD, which are constructed such that the occurrence of small plaquette values is strongly suppressed. Such actions originate from the admissibility condition as proposed by M. Lüscher in order to conserve the topological charge. The suppression of small plaquette values is expected to be advantageous for numerical studies in the epsilon regime and also for simulations with dynamical quarks. Performing simulations at a lattice spacing of about 0.1fm, we present numerical results for the static potential, the physical scale r_0 , the stability of the topological charge, the condition number of the kernel of the overlap operator and the acceptance rate against the step size in local HMC process. In addition, we discuss the question of reflection positivity for a class of such gauge actions.