

Scaling test of the P4-improved staggered fermion action.

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Abstract: We present a scaling study of the QCD spectrum using a smeared p4 staggered fermion formulation, in which three, five, and seven link staples are added to reduce the effects of flavor symmetry breaking. These studies are performed on quenched lattices generated using the tree-level improved Symanzik gauge action, with sizes of $16^3 \times 32$ and $24^3 \times 32$. The corresponding lattice spacings are $a = .31$ fm and $.21$ fm, and $.14$ fm. We also present preliminary results on the finite temperature phase transition in 2+1 flavor QCD, along with the corresponding zero temperature scale setting calculation.