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Progress on the QCD Deconfinement Critical Point for $N_f = 2$ Staggered Fermions

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The global center symmetry of quenched QCD at zero baryonic chemical potential is broken spontaneously at a critical temperature T_c leading to a first-order phase transition. Including heavy dynamical quarks breaks the center symmetry explicitly and weakens the first-order phase transition for decreasing quark masses until it turns into a smooth crossover at a Z_2-critical point. We investigate the Z_2-critical quark mass value towards the continuum limit for $N_f = 2$ flavors using lattice QCD in the staggered formulation. As part of a continued study, we present results from Monte-Carlo simulations on $N_\tau = 8, 10$ lattices. Several aspect ratios and quark mass values were simulated in order to obtain the critical mass from a fit of the Polyakov loop to a kurtosis finite size scaling formula. Moreover, the possibility to develop a Ginzburg-Landau effective theory around the Z_2-critical point is explored. The coefficients of the Landau functional can be determined from fits of the Polyakov loop to the data as a function of the bare parameters.

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