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The QCD Deconfinement Critical Point for $N_f = 2$ Flavors of Staggered Fermions

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Quenched QCD at zero baryonic chemical potential undergoes a deconfinement phase transition at a critical temperature T_c, which is related to the spontaneous breaking of the global center symmetry. Including heavy but dynamical quarks breaks the center symmetry explicitly and weakens the first order phase transition. For decreasing quark masses the first order phase transition turns into a smooth crossover at a critical Z_2 point. The critical quark mass corresponding to this point has been examined with $N_f = 2$ Wilson fermions for several N_τ in a recent study within our group. For comparison, we also localize the critical Z_2 point with $N_f = 2$ staggered fermions on $N_\tau = 8$ lattices. For this purpose we perform Monte Carlo simulations for several quark mass values and various aspect ratios in order to extrapolate to the thermodynamic limit. The critical mass is obtained by fitting to a finite size scaling formula of the kurtosis of the Polyakov loop. Our results indicate large cutoff effects, requiring simulations on lattices with $N_\tau > 8$.

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