The chiral critical point of $N_f = 3$ QCD: towards the continuum

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Three flavour QCD on $N_t = 4$ lattices with staggered fermions displays a first order thermal phase transition for light bare quark masses $m < m_c$, which changes to a smooth crossover for $m > m_c$. The critical bare mass $m_c$, marking the boundary between those regimes, is characterized by a second order phase transition belonging to the universality class of the 3d Ising model. We present first numerical results of an investigation on finer $N_t = 6$ lattices, showing the critical bare quark mass to shift to significantly smaller values compared to the coarser lattice. We investigate scaling violations in the corresponding pion mass and the curvature of the critical line $T_c(\mu)$. Implications for the critical point at finite density are discussed.