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Baryonic screening masses in high temperature QCD

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We compute the screening masses of fields with nucleon quantum numbers for a wide range of temperatures between $T \sim 1$ GeV and $T \sim 160$ GeV. The computation has been performed by means of Monte Carlo simulations of lattice QCD with $N_f = 2 + 1$ flavors of $O(a)$ -improved Wilson fermions: we exploit a novel strategy which has recently allowed to determine for the first time non-singlet mesonic screening masses up to extremely high temperatures. The baryonic screening masses are measured with a few per-mille precision in the continuum limit, and percent deviations from the free theory result $3\pi T$ are clearly visible even at the highest temperatures. The observed degeneracy of the positive and negative parity state's screening mass, expected from Ward identities associated to non-singlet axial transformations, provides further evidence for the restoration of chiral symmetry in the high temperature regime of QCD.

Topical area

QCD at Non-zero Temperature

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