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Thermodynamics and phase structure of strongly-interacting matter

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Polyakov-loop-extended constituent-quark models are useful to investigate the phase structure and thermodynamics of strongly-interacting matter. We show that taking into account the quark backreaction on the gauge-field dynamics as well as quantum and thermal fluctuations of quarks and mesons is crucial in such models to achieve results for order parameters and thermodynamics that are in line with lattice calculations at vanishing chemical potential. Achieving a good agreement with non-perturbative calculations at zero density, we extend the investigations to nonzero quark density and isospin. We present the impact of unquenching effects in the Polyakov-loop potential on the phase structure at non-vanishing quark densities and show predictions for thermodynamics at nonzero isospin. We test the reliability of those models by confronting its results with lattice data on the isospin dependence of the transition temperature. Furthermore, we investigate the phase structure of the three-dimensional temperature - isospin - quark density phase diagram and calculate the surface tension for the phase transition at small temperatures and large densities.

On behalf of collaboration:

None

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