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Lattice QCD equation of state at finite chemical potential from an alternative expansion scheme

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Taylor expansion of the equation of state of QCD suffers from shortcomings at chemical potentials $\mu_B \geq (2 - 2.5)T$. First, one faces difficulties inherent in performing such an expansion with a limited number of coefficients; second, higher order coefficients determined from lattice calculations suffer from a poor signal-to-noise ratio. We present a novel scheme for extrapolating the equation of state of QCD to finite, real chemical potential that can extend its reach further than previous methods. We show continuum extrapolated lattice results for the new expansion coefficients and for the thermodynamic observables up to $\mu_B/T \leq 3.5$.

Collaboration

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