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PNJL equation of state with off-shell mesonic excitations

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We study the contribution to the equation of state from mesonic correlations in the Polyakov-loop Nambu–Jona-Lasinio model within the Beth-Uhlenbeck approach, with a focus on the spacelike region of the spectral function. We show that the inclusion of such excitations leads to a significant increase of the pressure of the model near the pseudocritical temperature of the chiral phase transition and a significant meson momentum cut-off dependence in the mesonic pressure and the QCD trace anomaly. By means of the Feynman-Hellmann theorem, we show that the off-shell meson contribution to the chiral condensate can lead to a lowering of the chiral pseudocritical temperature, which may be essential to reduce the tension between PNJL mean field and lattice QCD results.

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Category

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