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Identification of MOAT regime and inhomogenous phases

Inhomogenous phases or MOAT regimes of QCD matter could emerge at non-vanishing density, as demonstrated recently by calculations using functional methods. In this work, we investigate the stability of such phases within a low-energy effective theory, where the free energy F was calculated as the spatial derivative expansion of an order parameter Φ out of the Landau- Ginsburg-theory. We calculated equilibrium behaviour of the field through numerical simulations on in 2D, using lattice Monte-Carlo methods. In form of spatial modulations on the lattice, we found MOAT regime and inhomogeneous phase, in addition to the homogeneous symmetric and broken phases, following predictions from mean-field-theory. The analysis was made with the 2 point Correlation function and cluster-size distribution.

Category

Theory

Collaboration (if applicable)

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