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Phase diagram of the three-flavor PNJL model

The QCD phase diagram and transitions between quark and hadron phases are in the focus of recent investigations in both theoretical and experimental fields of heavy energy physics. For a description of matter at high temperature and density effective models of Nambu-Jona-Lasinio-type have proven most useful. On the basis of NJL-type models it is possible to describe the chiral restoration transition and to describe the quark-gluon coupling and confinement transition, when the Polyakov loop is included. The Polyakov loop extended NJL (PNJL) model can reproduce results of lattice QCD at zero and imaginary chemical potential, where LQCD has no sign problem. In this poster contribution we present the dependence of the first-order phase transition line and its critical endpoint in the PNJL model phase diagram when the following aspects are taken into account:

- different parametrizations of the effective potential $U(\Phi, \bar{\Phi}; T)$
- including the coupling of quarks to a repulsive vector mean field,
- modification of the quark interaction by “entanglement” with the Polyakov loop.

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