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Entanglement between deconfinement transition and chiral symmetry restoration

We extend the Polyakov-loop extended Nambu–-Jona-Lasinio (PNJL) model by introducing an effective four-quark vertex depending on Polyakov loop. The effective vertex generates entanglement interactions between Polyakov loop and chiral condensate. The new model is consistent with lattice QCD data at imaginary quark number

chemical potential and real and imaginary isospin chemical potentials, particularly on strong correlation between the chiral and deconfinement transitions and also on the quark mass dependence of the order of the Roberge-Weiss endpoint. We investigate the influence of the entanglement interactions on the location of the tricritical point at real isospin chemical potential and on the location of the critical endpoint at real quark number chemical potential.

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