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Critical exponents of chiral and isospin phase transitions

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We investigate chiral and isospin symmetries of QCD matter at finite temperature and density in the frame of functional renormalization group. The critical exponents and universality class are explored by analyzing the fixed points of scale transformation and RG flow around them. The dimension of the system near the phase transition is found to be temperature-dependent, resulting in continuous change of pion superfluid from 4d O(2) universality class at zero temperature to 3d O(2) at high temperature. Moreover, the critical dimension of chiral critical end point is determined, the critical exponents and universality class of chiral CEP are entirely described by symmetry and critical dimension, even though its location in phase diagram is model-dependent. This sheds light to further seeking of CEP location and critical phenomenon in QCD phase diagram.

On behalf of collaboration:

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