Critical phenomena at the tensor ordering phase transition

G. A. Kalagov

Joint Institute for Nuclear Research, 6 Joliot-Curie St., Dubna, Russia, 141980
kalagov@jinr.ru

We reveal the critical properties of the phase transition towards superfluid order that has been proposed to occur in large spin fermionic systems. For this purpose, we consider the bosonic field theory for fluctuations of the complex skew-symmetric rank-2 tensor order parameter close to the transition. We then non-perturbatively determine the scale dependence of the couplings of the theory by means of the functional renormalization group. We established a fluctuation-induced first-order phase transition. In the weak-coupling regime the jump in the order parameter is small and a new phase occurs almost continuously, while in the strong one the discontinuity of the transition is well detectable (DOI: 10.1016/j.nuclphysb.2023.116192).