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The magnetized Gross-Neveu model at finite chemical potential

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Relativistic fermionic theories with four-Fermi interactions have a broad range of applications, e.g., as toy models for QCD as well as in condensed-matter physics. We study the simplest such theory, the so-called Gross-Neveu model, exposed to a background magnetic field in 2+1 dimensions. In the mean-field limit the model exhibits a rich phase structure when the magnetic field and the chemical potential are both non-zero. We investigate the phase diagram of the full (i.e., beyond-mean-field) Gross-Neveu model on the lattice, using overlap fermions, and find that it is much simpler than in the mean-field limit.

Topical area

QCD at Non-zero Density

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