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FFLO states in resonant Fermi gases

SUNGKIT YIP, Academia Sinica, Taiwan

We discuss the possible phases of two-component Fermi gas with population imbalance. In particular, we consider the various states proposed by Fulde-Ferrell and Larkin-Ovchinnikov. We distinguish between the plane-wave state $\Delta \sim e^{iqr}$, where the magnitude of the order parameter is uniform in space but the phase varies continuously in space, from those where the order parameters are real but change sign from one spatial region to the other. The later states, considered first by Larkin and Ovchinnikov, occupy a much larger region in the uniform phase diagram than previously suggested by other authors. If time permits, we shall discuss also the situation in a harmonic trap.