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Single-plane-wave Larkin-Ovchinnikov-Fulde-Ferrell state in BCS–Bose-Einstein condensation crossover YAN HE, CHIH-CHUN CHIEN, QIJIN CHEN, KATHY LEVIN, University of Chicago — We study the single-plane-wave Larkin-Ovchinnikov-Fulde-Ferrell (LOFF) states for BCS–Bose-Einstein condensation (BEC) crossover at general temperatures T . Because we include the important effects of noncondensed pairs, our $T \neq 0$ phase diagrams are different from those reported in earlier work. We find that generalized LOFF phases may be the ground state for a wide range of (weak through moderately strong) interactions, including the unitary regime. However, these LOFF phases are readily destroyed by non-zero T . We also explore the competition between LOFF phases and phase separated states. In the cold gases, phase separation is generally the more stable, although in QCD and other applications, of LOFF physics, phase separation is not always a physical option.

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