

Abstract Submitted  
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**Quantum phases of atomic Fermi gases with spin-orbit coupling**<sup>1</sup> MENDERES ISKIN, Koc University, LEVENT SUBASI, Istanbul Technical University — We consider a general anisotropic spin-orbit coupling and analyze the phase diagrams of both balanced and imbalanced Fermi gases for the entire BCS-BEC evolution. First we use the self-consistent mean-field theory at zero temperature, and show that the topological structure of the ground-state phase diagrams is quite robust against the effects of anisotropy. Then we go beyond the mean-field description, and investigate the effects of Gaussian fluctuations near the critical temperature. This allows us to derive the time-dependent Ginzburg-Landau theory, from which we extract the effective mass of the Cooper pairs and their critical condensation temperature in the molecular BEC limit.

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