

Abstract Submitted
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Novel phases of color superconductivity JEFFREY BOWERS, University of Washington — Cold dense quark matter is a color superconductor. QCD favors Cooper pair that are antisymmetric in flavor, but at densities relevant for compact stars, charge neutrality and the heaviness of the strange quark together imply unequal number densities (and Fermi surfaces) for the different quark flavors. Novel phases have been proposed that accomodate pairing between the mismatched Fermi surfaces. These include homogeneous and isotropic Sarma (“gapless”) phases, in which the Fermi sphere occupation is redistributed to allow pairing, and inhomogeneous and anisotropic Larkin-Ovchinnikov-Fulde-Ferrell (LOFF) phases, in which Cooper pairs acquire nonzero total momentum. I investigate the stability of the Sarma phase when it is subjected to a small LOFF fluctuation, i.e. a small spatial variation of the order parameter, with a concomitant charge density wave. These fluctuations lower the free energy of the system when the Coulomb energy of the charge density wave is sufficiently small.

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