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Microscopic analysis of the stability of half-quantum vortices in $p_x + ip_y$ superfluids in an annular geometry.[1] VICTOR VAKARYUK, University of Illinois at Urbana-Champaign — We present a microscopic analysis of the thermodynamic stability of a half-quantum vortex (HQV) in $p_x + ip_y$ variant of equal-spin-pairing state which, under suitable conditions, is believed to be realized in Sr_2RuO_4 and ^{3}He-A. Our approach is based on a description of the HQV in terms of a BCS-like wave function with a spin-dependent boost. Stability criterion is found by comparing energies of half- and full-quantum vortices with appropriate account taken of Fermi liquid corrections. While we confirm earlier phenomenological findings by Suk Bum Chung et al. (2007) for the stability of the HQV in the annular geometry, we also predict a novel feature that the HQV, if exists, should be accompanied by a non-zero spin polarization of the system.

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