

Abstract Submitted  
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**Charge Conservation in BdG Formalism and its Effect in Calculating Berry Phase of Transporting a Localized BdG Quasiparticle around a Vortex in Superfluids/Superconductors** YIRUO LIN, TONY LEGGETT, University of Illinois at Urbana-Champaign — We examine charge conservation in BdG formalism and discuss the consequence of violating the charge conservation in Berry phase calculation of transporting a localized BdG quasiparticle around a vortex in superfluids/superconductors. We calculate explicitly the Berry phase in a model system in which the vortex is replaced by a 1D annulus ring geometry with quantized superfluid center-of-mass winding number and a localized Zeeman field is imposed to trap a quasiparticle with definite spin orientation.

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