

Abstract Submitted  
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**Proposed Aharonov-Casher interferometry of non-Abelian vortices in chiral p-wave superconductors**<sup>1</sup> EYTAN GROSFELD, BABAK SERADJEH, SMITHA VISHVESHWARA, University of Illinois at Urbana-Champaign — We propose a two-path vortex interferometry experiment based on the Aharonov-Casher effect for detecting the non-Abelian nature of vortices in a chiral p-wave superconductor. The effect is based on observing vortex interference patterns upon enclosing a finite charge of externally controllable magnitude within the interference path. We predict that when the interfering vortices enclose an odd number of identical vortices in their path, the interference pattern disappears only for non-Abelian vortices. When pairing involves two distinct spin species, we derive the mutual statistics between half quantum and full quantum vortices and show that, remarkably, our predictions still hold for the situation of a full quantum vortex enclosing a half quantum vortex in its path. We discuss the experimentally relevant conditions under which these effects can be observed.

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