

Abstract Submitted  
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**Majorana Fermion Signatures in Flux Quantum Tunneling** PEDRO LOPES, UNICAMP-Univ de Campinas/UIUC, VASUDHA SHIVAMOGGI, UIUC, AMIR CALDEIRA, UNICAMP-Univ de Campinas — We propose Majorana fermions signatures in quantum tunneling experiments on SQUIDs composed of topological superconductors. Majorana fermions in a single Josephson junction have well-studied signatures which rely on single electron transfers. We investigate the effect of Majorana fermions on the flux, rather than charge, degree of freedom of a superconducting loop. Tuning of the applied magnetic flux through the loop can cause the system to tunnel between states with different enclosed flux quanta. We study how this tunneling picture may be modified in the presence of Majorana fermions. We use a 1+1D spinless p-wave model which hosts Majorana fermions in the topological phase to introduce and argue in favor of a phenomenological model, and demonstrate that novel phase slipping and quantum tunneling physics arise as a consequence.

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