MAR15-2014-020849

Abstract for an Invited Paper
for the MAR15 Meeting of
the American Physical Society

Local Adiabatic Mixing of Kramers Pairs of Majorana Bound States

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In this talk adiabatic time evolution of Kramers pairs of Majorana bound states and the prospects of using such bound states as parity qubits are discussed. It is shown that local adiabatic perturbations can cause a rotation in the space spanned by the Kramers pair and that the quantum information is therefore unprotected against local perturbations. This is in contrast to the case of single localized Majorana bound states in systems with broken time reversal symmetry. However, under certain conditions such mixing does not occurs. A general scheme for determining when these conditions are satisfied is explained and exemplified with a quasi-1D model of a time reversal symmetric topological superconductor.