Exact zero modes and decoherence in systems of interacting Majorana fermions[1] GUANG YANG, DMITRI FELDMAN, Brown Univ — Majorana fermions often coexist with other low-energy fermionic degrees of freedom. In such situation, topological quantum computation requires the use of fermionic zero modes of a many-body system. We classify all such modes for interacting fermions and show how to select the mode that maximizes the decoherence time. We find that in a typical interacting system the maximal decoherence time is within one order of magnitude from the decoherence time of a qbit, based on the local part of the fermion parity operator.

Guang Yang
Brown Univ

Date submitted: 12 Nov 2013   Electronic form version 1.4