Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Interface between Topological and Superconducting Qubits[1]
LIANG JIANG, California Institute of Technology, CHARLES KANE, University of Pennsylvania, JOHN PRESKILL, California Institute of Technology — We propose and analyze an interface between a topological qubit and a superconducting flux qubit. In our scheme, the interaction between Majorana fermions in a topological insulator is coherently controlled by a superconducting phase that depends on the quantum state of the flux qubit. A controlled phase gate, achieved by pulsing this interaction on and off, can transfer quantum information between the topological qubit and the superconducting qubit.

[1]This work was supported by the Sherman Fairchild Foundation, by NSF grants DMR-0906175 and PHY-0803371, by DOE grant DE-FG03-92-ER40701, and by NSA/ARO grant W911NF-09-1-0442.

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Date submitted: 16 Nov 2010 Electronic form version 1.4