Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Measurement of topological invariants with spin qubits in diamond KEIGO ARAI, JUNGHYUN LEE, Massachusetts Inst of Tech-MIT, CHINMAY BELTHANGADY, RONALD WALSWORTH, Harvard-Smithsonian Center for Astrophysics — We present our recent measurements on topological invariants using a single spin qubit in diamond. The ground states of nitrogen-vacancy (NV) color centers in diamond are used as an ideal qubit whose states can be fully controlled via the microwave frequency detuning, amplitude, and relative phase. Manipulating these parameters on a closed manifold, we study the topological invariants of three NV hyperfine states, which are topologically identical to a three interacting qubit system in the relevant parameter space. Finally, we construct a 2D topological phase diagram of the three interacting qubit system.

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Date submitted: 29 Jan 2016 Electronic form version 1.4