Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Electric polarization in a Chern insulator SINISA COH, DAVID VANDERBILT, Rutgers University — We extend the Berry-phase concept of polarization to insulators having a non-zero value of the Chern invariant. The generalization to such Chern insulators requires special care because of the partial occupation of chiral edge states. We show how the integrated bulk current arising from an adiabatic evolution can be related to a difference of bulk polarizations. We also show how the surface charge can be related to the bulk polarization, but only with a knowledge of the wavevector at which the occupancy of the edge state is discontinuous. We conclude by presenting numerical calculations on a model Hamiltonian to provide additional support for our analytic arguments.[1]

[1]Preprint: arXiv:0810.4549

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Date submitted: 17 Nov 2008 Electronic form version 1.4