Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

A many-body generalization of the Z_2 topological invariant for the quantum spin Hall effect[1] SUNG-SIK LEE, Department of Physics and Astronomy, McMaster University, SHINSEI RYU, Kavli Institute for Theoretical Physics, UCSB — We propose a many-body generalization of the Z_2 topological invariant for the quantum spin Hall insulator, which does not rely on single-particle band structures. The invariant is derived as a topological obstruction that distinguishes topologically distinct many-body ground states on a torus. It is also expressed as a Wilson-loop of the SU(2) Berry gauge field, which is quantized due to the time-reversal symmetry.

[1]This work has been supported by the National Science Foundation under Grant No. PHY05-51164.

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Date submitted: 26 Nov 2007 Electronic form version 1.4