

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Charge $4e$ Superconductivity from Quantum Spin Hall phase EUN GOOK MOON, CENKE XU, University of California Santa Barbara — We present how to achieve charge $4e$ superconductor as a ground state studying non-relativistically induced quantum numbers of Skyrmions. It is shown that induced charge of Skyrmions interacting with fermion with quadratic band touching dispersion is twice bigger than one of Skyrmions with Dirac-like fermion. We also show that the former Skyrmions are always bosons while the latter ones are determined by the number of fermion flavors. Possible physical realization is discussed focusing on Skyrmions of quantum spin Hall order parameter in bi-layer graphene. Properties of quantum phase transition between charge $4e$ superconductor and quantum spin Hall phase are also discussed.

Eun Gook Moon
University of Santa Barbara

Date submitted: 10 Nov 2011

Electronic form version 1.4