Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Evolution of the surface states at the phase transitions between Weyl semimetal and topological insulator phases RYO OKUGAWA, Tokyo Institute of Technology, SHUICHI MURAKAMI, TIES, Tokyo Institute of Technology — Weyl semimetal phases are known to arise between topological insulator and normal insulator phases when the inversion symmetry is broken. We study changes of surface at the phase transition between Weyl semimetal and topological phases, when the system is inversion-asymmetric. To this end we use the Fu-Kane-Mele model, and we add an alternating on-site potential to break the inversion symmetry. This model shows Weyl semimetal and topological insulator phases. At the phase transition, Dirac points in the bulk are created in pairs. Correspondingly we observe evolution of the surface states from the Dirac cones in the topological insulator to Fermi arc, which is a topologically protected surface in Weyl semimetals. The penetration depth of the Weyl semimetal and topological insulator is also calculated, which accounts for a gap due to finite-size effects.

Ryo Okugawa
Tokyo Institute of Technology

Date submitted: 12 Nov 2013 Electronic form version 1.4