Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Photoinduced Topological phase Transition in a 2D Fermi System with a Quadratic Band Crossing XIAOTING ZHOU, GREGORY A. FIETE, Department of Physics, Univ of Texas, Austin — Recent years, physicists have been gripped by the topological phases in condensed matter systems, and many attentions have been concentrated on the pursuit of new topological matters. The achievement of the topological control by the external fields provides a new direction. Using Floquet theory, we demonstrate that, a topologically stable quadratic band-crossing point (QBCP), carrying a Berry flux $\pm 2\Pi$ (or -2Π) , would be splitted into 2 Dirac points with Berry flux Π (or $-\Pi$), by the irradiation of a linearly polarized light. And the QBCP will either be lifted due to the breaking of the time-reversal symmetry, or go to a trivial QBCP with distinct topological properties, by introducing a circularly polarized light. Therefore, the manipulation of band structure could be realized.

Xiaoting Zhou
Univ of Texas, Austin

Date submitted: 14 Nov 2014 Electronic form version 1.4