Abstract Submitted
for the MAS14 Meeting of
The American Physical Society

Spin Texture and Mirror Chern number in Hg-Based Chalcogenides[1] CHAOXING LIU, QINGZE WANG, The Penn State University, SHU-CHUN WU, CLAUDIA FELSER, BINGHAI YAN, Max Planck Institute for Chemical Physics of Solids — The unique feature of surface states in topological insulators is the so-called "spin-momentum locking," which means that electron spin is oriented along a fixed direction for a given momentum and forms a texture in the momentum space. In this work, we study spin textures of two typical topological insulators in Hg-Based Chalcogenides, namely HgTe and HgS, based on both the first principles calculation and the eight band Kane model. We find opposite helicities of spin textures between these two materials, originating from the opposite signs of spin-orbit couplings. Furthermore, we reveal that different mirror Chern numbers between HgTe and HgS characterize different topological natures of the systems with opposite spin textures and guarantee the existence of gapless interface states.

[1]This work is supported by ERC Advanced Grant (291472).

Chaoxing Liu
The Penn State University

Date submitted: 29 Aug 2014 Electronic form version 1.4