Abstract Submitted
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Hexagonal Warping Effects on the Surface of Topological Insulators[1] LIANG FU, Harvard University — A single two-dimensinoal Dirac fermion state has been recently observed on the surface of topological insulator Bi2Te3 by angle-resolved photoemission spectroscopy(ARPES). We study the surface band structure using $k \cdot p$ theory and find an unconventional hexagonal warping term, which is a counterpart of cubic Dresselhaus spin-orbit coupling in rhombohedral latices. We find hexagonal warping naturally explains the observed snowflake shape of the Fermi surface, and extract its magnitude. We predict a number of testable signatures of hexagonal warping in ARPES and STM experiments on Bi_2Te_3. We also explore the possibility of a spin-density wave due to strong nesting of the Fermi surface. Ref: L. Fu, arXiv:0908.1418, PRL in press

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