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Topological Surface States in Ternary Spin-Orbit Insulators: An ARPES Viewpoint[1] MADHAB NEUPANE, S.-Y. XU, Department of Physics, Princeton University, L.A. WRAY, ALS, Lawrence Berkeley National Laboratory & Princeton University, A. PETERSEN, R. SHANKAR, Department of Physics, Princeton University, A. FEDOROV, ALS, Lawrence Berkeley National Laboratory, C. LIU, Department of Physics, Princeton University, Y.S. HOR, Department of Chemistry, Princeton University, J. XIONG, D.-X. QU, Department of Physics, Princeton University, H. LIN, Northeastern University, N.P. ONG, Department of Physics, Princeton University, A. BANSIL, Northeastern University, R.J. CAVA, Department of Chemistry, Princeton University, M.Z. HASAN, Department of Physics, Princeton University
— Utilization of topological surface states is expected to lead to new vistas in electronics and fundamental physics. However, most of the known topological insulators either do not feature necessary band structure conditions (location of Dirac point with respect to the bulk band) or lack topological invariants essential for certain class of applications. Using angle-resolved photoemission spectroscopy (ARPES), we discuss the electronic band structure topology of a family of ternary spin-orbit insulators some of which feature functional electronic structure with in-gap Dirac point while others feature novel topological invariants (weak Z2 invariants) in crystalline form. We also present some of our recent results on ternary topological insulators.

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