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Topological Insulators in Ternary Compounds with a Honeycomb Lattice[1] HAI-JUN ZHANG, Stanford University, STANISLAV CHADOV, LUKAS MUCHLER, Institut fur Anorganische Chemie und Analytische Chemie, Johannes Gutenberg - Universtitat, Germany, BINGHAI YAN, XIAO-LIANG QI, Stanford University, JÜRGEN KÜBLER, Institut für Festkörperphysik, Technische Universit"at Darmstadt, Germany, SHOU-CHENG ZHANG, Stanford University, CLAUDIA FELSER, Institut fur Anorganische Chemie und Analytische Chemie, Johannes Gutenberg - Universtitat, Germany — One of the most exciting subjects in solid state physics is a single layer of graphite which exhibits a variety of unconventional novel properties. The key feature of its electronic structure are linear dispersive bands which cross in a single point at the Fermi energy. This is so-called Dirac cone. The ternary compounds, such as LiAuSe and KHgSb with a honeycomb structure of their Au-Se and Hg-Sb layers feature band inversion very similar to HgTe which is a strong precondition for existence of the topological surface states. These materials exhibit the surface states formed by only a single Dirac cone at the G point together with the small direct band gap opened by a strong spin-orbit coupling (SOC) in the bulk. These materials are centro-symmetric, therefore, it is possible to determine the parity of their wave functions, and hence, their topological character.

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