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**The nontrivial electronic structure of Bi/Sb honeycombs on SiC(0001)** FENG-CHUAN CHUANG, CHIA-HSIU HSU, ZHI-QUAN HUANG, CHIEN-CHENG KUO, Natl. Sun Yat-sen U., YU-TZU LIU, HSIN LIN, Natl. U. of Singapore, ARUN BANSIL, Northeastern U. — We discuss two-dimensional (2D) topological insulators (TIs) based on planar Bi/Sb honeycombs on a SiC(0001) substrate using first-principles computations. The Bi/Sb planar honeycombs on SiC(0001) are shown to support a nontrivial band gap as large as 0.56 eV, which harbors a Dirac cone lying within the band gap. Effects of hydrogen atoms placed on either just one side or on both sides of the planar honeycombs are examined. The hydrogenated honeycombs are found to exhibit topologically protected edge states for zigzag as well as armchair edges, with a wide band gap of 1.03 eV and 0.41 eV in bismuth and antimony films, respectively. Our findings pave the way for using planar bismuth and antimony honeycombs as potential new 2D-TI platforms for room-temperature applications.

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