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Anisotropic spin-singlet pairings in CuxBi2Se3 and Bi2Te3 WEI-FENG TSAI, National Sun Yat-sen University, Kaohsiung, Taiwan, LEI HAO, GUI-LING WANG, Southeast University, Nanjing, China, TING-KUO LEE, Institute of Physics, Academia Sinica, Taipei, Taiwan, JUN WANG, YONG-HONG YANG, Southeast University, Nanjing, China — We report possible anisotropic spin-singlet pairings in Bi2X3 (X is Se or Te). Among six pairings compatible with the crystal symmetry, two novel pairings show nontrivial surface Andreev bound states, which form flat bands and could produce zero-bias conductance peak in measurements such as point-contact spectroscopy. By considering purely repulsive short-range Coulomb interaction as the pairing mechanism, the dominant super-exchange terms are all antiferromagnetic, which would usually favor spin-singlet pairing in Bi2X3. Mean-field analyses show that the inter-orbital pairing interaction favors a mixed spatial-parity anisotropic pairing state, and one pairing channel with zero-energy surface states has a sizable component. The results provide important information for future experiments.

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