

Abstract Submitted
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Point-contact Andreev Reflection Spectroscopy on Bi₂Se₃ Single Crystal XUNCHI CHEN, CHAO HUAN, Georgia Inst of Tech, IREK MITKOWSKI, YONG CHEN, Purdue University, ZHIGANG JIANG, Georgia Inst of Tech — Point-contact spectroscopy measurement is carried out on Bi₂Se₃ single crystals via approaching a superconducting niobium tip ($T_c=9.5$ K) to the crystal surface. The tip-sample junction conductance is studied as a function of DC bias voltage, temperature, and magnetic field. The resulting spectra show a conductance dip at zero bias, indicative of ballistic transport. A homebuilt positioning stage enables us to approach the superconducting tip in nanometer accuracy, to precisely control the inter-facial barrier strength. We find that our experimental results cannot be simply described by the standard Blonder, Tinkham and Klapwijk (BTK) model even when the inelastic scattering at the interface is considered. An improved model taking into account the spin-orbit coupling effect is needed to fit our data.

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