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Andreev Reflection Spectroscopy of Nb-doped Bi_2Se_3 Topological Insulator[1] C. KURTER, Missouri University of Science and Technology, A.D.K. FINCK, University of Illinois at Urbana Champaign, Y. QIU, Missouri University of Science and Technology, E. HUEMILLER, A. WEIS, J. ATKINSON, University of Illinois at Urbana Champaign, J. MEDVEDEVA, Y.S. HOR, Missouri University of Science and Technology, D.J. VAN HARLINGEN, University of Illinois at Urbana Champaign — Doped topological insulators are speculated to realize p-wave superconductivity with unusual low energy quasiparticles, such as surface Andreev bound states. We present point contact spectroscopy of thin exfoliated flakes of Nb-doped Bi_2Se_3 where superconductivity persists up to $\sim$ 1 K, compared to 3.2 K in bulk crystals. The critical magnetic field is strongly anisotropic, consistent with quasi-2D behavior. Andreev reflection measurements of devices with low resistance contacts result in prominent BTK-like behavior with an enhanced conductance plateau at low bias. For high resistance contacts, we observe a split zero bias conductance anomaly and additional features at the superconducting gap. Our results suggest that this material is a promising platform for studying topological superconductivity.

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