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Point-contact spectroscopy study of the pairing symmetry of candidate topological superconductors XUNCHI CHEN, CHAO HUAN, Georgia Institute of Technology, YEW SAN HOR, Missouri University of Science and Technology, SATOSHI SASAKI, MARIO NOVAK, KOUJI SEGAWA, YOICHI ANDO, Institute of Scientific and Industrial Research, Osaka Univ., CARLOS SA DE MELO, ZHIGANG JIANG, Georgia Institute of Technology — The recently proposed topological superconducting materials are predicted to have odd parity paring and host Majorana fermions on the surface. Here we investigate the pairing symmetry of candidate topological superconductors, including CuxBi2Se3, Sn1-xInxTe, etc., via point-contact spectroscopy. The measurements are performed using both normal-metal gold tips and s-wave superconducting niobium tips. For samples with s-wave pairing, one would expect standard Andreev reflection in gold tip case and supercurrent-like behavior in niobium tip case. For CuxBi2Se3, however, we observe robust zero-bias conductance peak (ZBCP) in the differential conductance spectra with gold point contact, while with niobium point contact we find the height of the peak exhibiting an unusual non-monotonic temperature dependence. We argue that both observations cannot be explained by Andreev reflection within the standard BTK model, but signifying unconventional superconductivity in this material. For Sn1-xTnxTe samples, we observe ZBCP in the differential conductance spectra with gold point contact, while with niobium point contact, the temperature dependence of ZBCP is monotonic as expected from conventional theory, leaving the nature of the superconductivity of Sn1-xTnxTe still an open question.

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