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1-D Modes on Step-edges of the Putative Weak Topological Insulator BI2TeI NURIT AVRAHAM, ANDREW NORRIS, Weizmann Atomic Scale Physics Lab / Weizmann Institute of Science, Israel, LIN PAN, SHU-CHUN WU, CLAUDIA FELSER, BINGHAI YAN, Max Planck Institute for Chemical Physics of Solids, Dresden Germany, HAIM BEIDENKOPF, Weizmann Atomic Scale Physics Lab / Weizmann Institute of Science, Israel — Weak topological insulators are layered materials that possess surfaces with an even number of Dirac cones and surfaces that are fully gapped. This inherent anisotropy provides them with unique properties such as sensitivity to the parity of the number of layers and absence of localization of their surface states. We use scanning tunneling microscopy to study the topological properties of stacked Bi_2TeI, a promising candidate for weak topological insulator. We report the observation of the bulk energy gap on terraces perpendicular to the stacking direction and signatures of 1D intra-gap topological edge states along step-edges. The rich structure of quasi 2D terraces and Islands obtained on such cleaved Bi_2TeI surfaces provides an excellent playground to explore some of the most fundamental concepts of TIs such as their Z2 classification, "partner switching" of Kramer's degenerate pairs, and helical modes along dislocation lines.

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