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Structural Characterization of Stanene Grown on Bi_2Te_3 by Anomalous X-Ray Scattering STEPHEN D. ALBRIGHT, Department of Physics and Center for Research on Interface Structures and Phenomena (CRISP), Yale University, KE ZOU, RUI PENG, Department of Applied Physics and CRISP, Yale University, CLAUDIA LAU, Department of Physics and CRISP, Yale University, HAWOONG HONG, X-Ray Science Division, Argonne National Laboratory, CHARLES H. AHN, FRED J. WALKER, Department of Applied Physics and CRISP, Yale University — Two-dimensional topological insulators are promising materials for use in spintronics and the realization of dissipation-free conduction. Stanene, a hexagonal monolayer of Sn, is a promising candidate for these applications because it supports one-dimensional edge states and is predicted to have a large enough bandgap (> 0.1 eV) for devices to operate at elevated temperature. Here we report the growth of stanene on Bi_2Te_3 using molecular beam epitaxy. By growing stanene *in situ* at a synchrotron light source, we measure energy dependent scattering along Bi_2Te_3 crystal truncation rods (CTRs). The scattered intensity along Bi_2Te_3 CTRs undergoes a strong modulation as the incident x-ray energy is tuned across the Sn K-edge, indicating coherent growth of the stanene to the Bi_2Te_3 substrate. Analysis of these measurements reveals the particular polymorph of stanene on Bi_2Te_3.

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