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Raman spectroscopy of exfoliated Bi2Se3 LUKE SANDILANDS, FRANK ZHAO, CHRISTIANNE BEEKMAN, JOHN BASHUCKY, University of Toronto, DANIEL KWOK, Rutgers University, NARA LEE, SANG-WOOK CHEONG, Rutgers University, KENNETH BURCH, University of Toronto — The study of topological insulators is often frustrated by the presence of a residual bulk conductivity arising from defects which makes isolating the surface contribution to a given measurement difficult. Nanoscale topological insulators are therefore an appealing alternative to bulk crystals, as a small volume should emphasize surface contributions and allow the suppression of the residual bulk carriers by gating. To this end we have produced, via mechanical exfoliation, nanocrystals as thin as a 2 nm of the topological insulator Bi2Se3 on Mica substrates. Exfoliated crystals of a variety of thicknesses have been characterized by optical, Raman, and atomic force microscopies. We observe an emergent mode at 158 cm-1 which is attributed to the breaking of inversion symmetry at the Bi2Se3 surfaces. The utility of this emergent mode for determining nanocrystal thickness is discussed.

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