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Bi_2-Bi_2Se_3 Superlattice Materials Studied by Photoemission Spectroscopy ANDREW WEBER, Department of Physics and Astronomy, University of Missouri-Kansas City, IVO PLETIKOSIC, QUINN GIBSON, HUIWEN JI, LESLIE SCHOOP, Department of Chemistry, Princeton University, JUREK SADOWSKI, Center for Functional Nanomaterials, Brookhaven National Laboratory, ANTHONY CARUSO, Department of Physics and Astronomy, University of Missouri-Kansas City, ELIO VESCOVO, National Synchrotron Light Source, Brookhaven National Laboratory, ALEXEI FEDOROV, Advanced Light Source, Lawrence Berkeley National Laboratory, ROBERT CAVA, Department of Chemistry, Princeton University, TONICA VALLA, Condensed Matter Physics and Materials Science Department, Brookhaven National Laboratory — Although searches are carried out independently for new 2D quantum spin Hall or 3D topological materials for their robust, spin-polarized edge or surface conduction states, little has been done to experimentally show that both phases can coexist in a single material or explore how they may interact. The superlattice series $Bi_{2m}(Bi_2Se_3)_n$, featuring stacked layers of Bi_2 and Bi_2Se_3, may contain systems where a combination of 2D and 3D topological phenomena should be at play, the latter of which can be identified by combined computational and spin-and angle-resolved photoemission spectroscopy studies. We find that several members of the series, (m=0, n=1), (m=1, n=1) and (m=2, n=1) have spin-chiral surface states at the center of the surface Brillouin zone, a trait of strong topological insulators. The characterization of the topological surface states will be discussed for these series members.

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