Abstract Submitted 
for the MAR13 Meeting of 
The American Physical Society 

Structural and Electronic Properties in multilayer (BiSe)$_n$ (TiSe$_2$)$_m$ Misfit compounds 

BENJAMIN TRUMP, MAXIME SIEGLER, KEN LIVI, TYREL MCQUEEN, Johns Hopkins University — The nature of the charge density wave (CDW) transition in 1T-TiSe$_2$ has been hotly debated, and variously described as a simple CDW to the formation of an excitonic insulator. Here we report the synthesis and basic physical properties of the incommensurate layered chalcogenides (BiSe)$_n$ (TiSe$_2$)$_m$. Their structure consists of a rock-salt type BiSe layer separated by one or more edge-sharing TiSe$_2$ octahedral layer. These octahedral layers are isomorphic to the layers found in 1T-TiSe$_2$, and thus provide a mechanism to study the electronically driven structural transition in TiSe$_2$ as a function of the number of layers. Structural determinations from electron and x-ray diffraction, using 4/5-D superspace approach, will be presented, and the implications of our results on the understanding of CDW formation in TiSe$_2$ will be discussed. The effects of doping with Cu to observe possible superconducting behavior is also explored.

Benjamin Trump
Johns Hopkins University

Date submitted: 09 Nov 2012

Electronic form version 1.4