Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Effects of Dimensionality on the Charge-Density Wave Phases of Transition-Metal Dichalcogenides DANILO ROMERO, ECE Department, University of Maryland, College Park, MD 20740 and NIST Gaithersburg, MD 20899, JEFFREY SIMPSON, Towson University and NIST Gaithersburg, MD 20899, HELMUTH BERGER, EPSL, Lausanne, Switzerland, ANGELA HIGHT-WALKER, NIST Gaithersburg, MD 20899 — We investigate the effects of dimensionality on the electronic properties of the transition-metal dichalcogenides *2H*-$TaSe_2$, *1T*-$TaSe_2$, and *1T*-TaS_2. In bulk, these materials exhibit various commensurate and incommensurate charge-density wave (CDW) phase transitions that are currently attracting interest for possible CDW field-effect device applications. We explore the evolution of the CDW groundstate properties as the materials approach a few monolayers, achieved via mechanical exfoliation of bulk single-crystals. Raman spectroscopy of *2H*-$TaSe_2$ and *1T*-$TaSe_2$, and *1T*-TaS_2, carried out over a wide-range of temperatures, was used as probe of the change in the lattice dynamics from the bulk to the single-layer phases of these materials. The effect of dimensionality on the CDW transition temperatures will be presented.

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Date submitted: 14 Nov 2014 Electronic form version 1.4