Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

High Resolution X-ray investigation of few-layer Molybdenum Disulfide (MoS2) Based Heterostructures HASSANA SAMASSEKOU, RICHARD PETERSON, SAIKAT TALAPATRA, DIPANJAN MAZUMDAR, Southern Illinois University-Carbondale — Due to its favorable band gap, few-layer MoS2 can play an important role in optoelectronics and magneto-optics applications. Device applications necessitate a heterostructure combination of MoS2 with other compatible materials. Here we report the growth and characterization of structural properties of few-layer MoS2 based prototypes on Si substrates deposited by means of magnetron sputtering. A number of heteorstructure combinations such as MoS2/BN, MoS2/SiO2 shall be analyzed using high resolution X-ray reflectivity, scattering and diffraction methods. Our preliminary work already indicates that MoS2 deposited on BN is quite favorable for optoelectronic applications [1]. But substantial work remains in order to obtain abrupt interfaces and atomic-level control. High resolution X-ray analysis can provide the essential understanding into the various structural aspects (crystal structure, interface roughness, density thickness) which could be valuable for developing a diversity of optoelectronic applications using MoS_2 or other *transition metal dichalcogenides.* Ref 1: Wasala, Samassekou, et al. (under review).

Hassana Samassekou
Southern Illinois University-Carbondale

Date submitted: 05 Nov 2015 Electronic form version 1.4