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Optical properties of few-layer MoS2-based heterostructures ASMA ALKABSH, HASSANA SAMASSEKOU, ANDREW WALKER, DIPANJAN MAZUMDAR, SAIKAT TALAPATRA, Southern IL Univ-Carbondale — 2D materials such as Transition metal dichalcogenides (TMDs) are promising for a number of electronic/optoelectronic applications. In particular, semiconducting MoS2, is considered as one of the most interesting 2D material due to its direct band gap at the monolayer level [1]. For device applications, such desirable properties have to translate when MoS2 is layered with other materials and substrates. In this research, the optical properties of select MoS2-based heterostructres are investigated. In particular, the effect of various insulating underlayers such as BN, SiO2 on few-layer MoS_2 are examined using spectroscopic ellipsometry. The angles Ψ and Δ, as well as layer specific optical constants such as extinction coefficient (k) and refractive index (n) shall be extracted using Tauc-Lorentz oscillator model and as a function of MoS2 layer thickness and underlayer structure. The band gap properties of few-layer MoS2 will be analyzed using optical spectroscopy

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