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Investigation of Charge Transfer in Graphene-Based Heterostructure by Raman Spectroscopy HUI-CHUN CHIEN, MATT BELLUS, JATINDER KUMAR, HSIN-YING CHIU, University of Kansas, T.B. HOFFMAN, Y. ZHANG, J.H. EDGAR, Kansas State University — Van der Waals heterostructures are an emerging research area in novel electronics and optoelectronics. They can be assembled layer by layer with any stacking order via precise micromechanical manipulation. Moreover, their material properties can be theoretically tailored on demand. Two interesting properties, the interfacial interaction between dissimilar layer materials and the accordingly modified bandstructure, are important; however, they are rarely studied. Herein, we take graphene-MoS_2 as an example, and we utilize the well-studied Raman fingerprint of graphene to inspect charge transfer between graphene and an adjacent material. The layer dependence of charge transfer is observed as well as the edge effect. Further fundamental understanding of this heterostructure will be presented. Our work will serve as a platform to study the band alignment of graphene-based heterostructures.

Hui-Chun Chien
University of Kansas

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