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ARPES and Low-Energy Electron Microscopy Study on Supported, Suspended, and Bilayer Twisted MoS2 PO-CHUN YEH, WENCAN JIN, NADER ZAKI, DATONG ZHANG, JONATHAN. T. LIOU, Columbia Univ, JERZY T. SADOWSKI, ABDULLAH AL-MAHBOOB, BNL, JERRY I. DADAP, IRVING P. HERMAN, Columbia Univ, PETER SUTTER, BNL, RICHARD M. OSGOOD, JR, Columbia Univ — We report on the directly measured electronic structure of exfoliated monolayer molybdenum disulfide (MoS2) using micron-scale angle-resolved photoemission spectroscopy. Measurements of both suspended and supported monolayer MoS2 elucidate the effects of interaction with a substrate. For suspended MoS2, a careful investigation of the measured uppermost valence band gives the effective mass at Γ and K, and the estimated value of spin-orbit coupling induced splitting at K. Moreover, we prepare CVD synthesized twisted-bilayer MoS2 flakes on a native-oxide silicon substrate. Band structure of MoS2 for different twist angles is measured by using micro-ARPES, and their crystal orientations are determined by Micro-LEED. We investigate their dispersions, effective mass, and valence band maximum with respect to twist angle.

Po-Chun Yeh
Columbia Univ

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