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The Role of the Moire Pattern on the Electronic Band Structure of Mono- to Few Layer MoS2[1] D. TRAINER, A. PUTILOV, Physics Department, Temple University, Philadelphia PA 19122, USA, T. SAARI, Department of Physics, Tampere University of Technology, Tampere, Finland, T.-R. CHANG, H.-T. JENG, Department of Physics, National Tsing Hua University, Hsinchu 30013, Taiwan, H. LIN, Department of Physics, National University of Singapore, Singapore 117546, B. WANG, C. LANE, J. NIEMINEN, A. BANSIL, Physics Department, Northeastern University, Boston MA 02115, USA, X. X. XI, M. IAVARONE, Physics Department, Temple University, Philadelphia PA 19122, USA — Using low temperature high resolution scanning tunneling microscopy and spectroscopy (STM/STS) we have investigated MoS2 grown by chemical vapor deposition (CVD) on a substrate of highly oriented pyrolytic graphite (HOPG). Atomic resolution images reveal clear Moiré patterns, which in general arise due to a lattice mismatch or rotational misalignment between weakly interacting MoS2 layers and between the first MoS2 layer and the substrate. The quasi-particle band-gap was analyzed as a function of the lattice rotation. Changes in the band structure were supported by density functional theory (DFT) calculations.

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