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Electrical transport properties of metal and graphene contacts to MoS_2 YUNQIU (KELLY) LUO, The Ohio State University, HUA WEN, University of California, Riverside, TIANCONG ZHU, The Ohio State University — Two-dimensional crystals are an exciting class of materials for novel physics and nanoelectronics. MoS_2 and related transition metal dichalcogenides have received tremendous interest due to its native band gap and strong spin orbit coupling. Unlike graphene, the presence of the band gap leads to transistors with high on-off ratios. One important issue is the electrical properties of the contacts to the MoS_2. Recent studies have shown the presence of a Schottky barrier and its dependence on the metal workfunction, back gate voltage, and interfacial oxide barriers. In this work, we investigate the interfacial properties of metal to MoS_2 contact and graphene to MoS2 contact by studying the junction's Schottky barrier formation and bias dependence. We utilize a polymer based transfer method to precisely position exfoliated graphene flakes onto exfoliated MoS_2 flakes. We intensively study various junction combination between monolayer/few-layer graphene and monolayer/few-layer MoS_2. Dependence on temperature and back gate will be discussed.

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