

Abstract Submitted
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Controlled n-doping of monolayer MoS₂ by atomic hydrogen JY-OTI KATOCH, TIANCONG ZHU, Department of Physics, The Ohio State University, Columbus, OH 43210, HUA WEN, Department of Physics and Astronomy, University of California, Riverside, CA 92521, ROLAND KAWAKAMI, Department of Physics, The Ohio State University, Columbus, OH 43210; Department of Physics and Astronomy, University of California, Riverside, CA — Molybdenum Disulfide (MoS₂) is a 2D layered material with potential applications in optoelectronics, electronics and spintronics. The injection of electrons in MoS₂ is affected and limited by the Schottky barrier formed between metal contact and MoS₂. There is a great deal of research interest to experimentally demonstrate ohmic contacts onto MoS₂ in order to fully unravel the potential of this exciting material. We will present our results on controlled doping of single layer MoS₂ surface by hydrogen to improve the contact resistance. We measured the transport properties of the MoS₂ as a function of successive atomic hydrogen dosage at low temperature in ultra-high vacuum. Atomic hydrogen is generated using a hydrogen cracker. We observe that hydrogen adsorption results in negative doping due to charge donation by hydrogen to MoS₂. Furthermore we will discuss the stability of atomic hydrogen on warming up the sample to room temperature.

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