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Properties of field-effect transistors of CVD grown MoS_2 single atomic layers on CVD grown hexagonal Boron Nitride NIHAR PRADHAN, DANIEL RHODES, QIU ZHANG, National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL, USA, ANA ELIAS, N. LOPEZ, Department of Physics, The Pennsylvania State University, University Park, PA, USA, ZHENG LIU, SINA NAJMEI, JUN LOU, Department of Mechanical Engineering & Materials Science, Rice University, Houston, TX, USA, SAIKAT TALAPATRA, Department of Physics, Southern Illinois University, Carbondale, IL, USA, MAURICIO TERRONES, Department of Physics, The Pennsylvania State University, University Park, PA, USA, PULICKEL AJAYAN, Department of Mechanical Engineering & Materials Science, Rice University, Houston, TX, USA, LUIS BALICAS, National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL, USA
— Two dimensional crystalline layered materials such as MoS_2, WS_2, have recently become an intense focus of research activities due to their exceptional electronic and optical properties. A single- or a few atomic layers of these materials show quite promising charge conduction characteristics, such as large mobility or fast on/off switch ratios, which lead to a few recent examples of integrated circuits based on these materials. Here, we will present a comparison among the electronic transport properties of, either mechanically exfoliated or CVD grown MoS_2 under different substrates, i.e. on SiO_2, on exfoliated or on CVD grown h-BN, and suspended. We will also discuss results obtained from back and top gated configurations with different dielectrics.

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