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The Effects of Mica Substrate on Exfoliated Molybdenum Disulfide ERIN SUTTON, EDWARD GEORGE, KENNETH BURCH, MARCEL HOEK, Boston College — Molybdenum disulfide is a two-dimensional semiconductor which has recently caught a lot of attention due to its 2D behavior and unique electronic and optical properties, emerging as an analogue to graphene with the advantage of a non-zero band gap. MoS₂ consists of atomically thin sheets stacked on top of each other and held together by van der Waals forces, which easily allows for interlayer cleaving. However, as-grown MoS₂ usually is strongly doped. We wanted to understand the effects the substrate on which the MoS₂ is exfoliated has on the crystal's properties. We carefully mechanically exfoliated MoS₂ on Mica and Hafnium Oxide substrates, and took Raman and photoluminescence measurements of the exfoliated flakes ranging from 1 layer to 5 layer thicknesses. Obtained results contribute to our understanding of substrate-to-crystal interactions, in addition to the crystal lattice and optical properties of two-dimensional atomic crystals.

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