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Slipping and friction at the interface between two-dimensional materials VIJAYASHREE PARSI SREENIVAS, RYAN NICHOLL, Vanderbilt University, KIRILL BOLOTIN, Vanderbilt University, Freie Universitt — Friction at the macroscopic scale is primarily due to the surface roughness while at the atomic scale it is governed by commensurability and environmental conditions. Here, we investigate slipping and friction at the interface between two dissimilar two-dimensional materials, such as graphene and monolayer molybdenum disulfide. Such a system provides a powerful platform to study frictional forces at the atomic scale as chemical nature of the interface and commensurability between the layers can be varied with ease. To carry out such a study, a monolayer of e.g. graphene is exfoliated onto a flexible substrate material – polypropylene - and clamped down by evaporating titanium to avoid slippage. A monolayer of e.g. MoS_2 is then transferred on top of graphene and the entire stack is strained using a four point bending apparatus. By measuring strain vs. bending via Raman spectroscopy, we detect slippage at graphene/MoS2 interface and characterize frictional forces as a function of interface parameters.

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