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A novel approach to friction measurements using dewetted polymer droplets ANDREW B. CROLL, KARI DALNOKI-VERESS, McMaster University — Friction is still quite difficult to accurately measure. The current state-of-the-art in friction measurement is the surface forces apparatus (SFA) or lateral force microscopy (LFM). While both are very useful tools, they suffer from a complicated distribution of pressure between substrate and slider. Here we present an experiment that overcomes that obstacle and also bridges the gap between point (LFM) and large area (SFA) contact. In these experiments we measure directly the constitutive law, which is not hindered by surface curvature effects because the dewetted polymer droplet acts as a slider with a perfectly flat interface. In the case of friction between a polystyrene droplet and an ultra-thin layer of poly(dimethyl siloxane), we obtain a power law dependence of friction on slider speed. Interestingly, the exponent of the power law is related to the normal force applied in a simple way.

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