Abstract Submitted
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Friction and plasticity between self-affine surfaces[1] BINQUAN LUAN, MARK ROBBINS, Johns Hopkins University, JUDITH HARRISON, U.S. Naval Academy — Simulations are used to study the contact area and adhesion between two amorphous solids with self-affine fractal surfaces, and the results are compared to continuum calculations. The friction between non-adhesive surfaces is proportional to load, but the coefficient of friction increases with roughness. The friction is much higher than expected for elasticallly deforming surfaces,* and substantial plastic deformation is observed. Indeed, friction forces for different surface roughness collapse when plotted against the number of plastic rearrangements per unit sliding distance. Including adhesion leads to an increase in both friction and plasticity.

* M. H. Müser, L. Wenning, and M. O. Robbins, Phys. Rev. Lett. **86**, 1295 (2001).

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