

Abstract Submitted
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Effects of Roughness and Inertia on Precursors to Frictional Sliding¹ MARK O. ROBBINS, K. MICHAEL SALERNO, Johns Hopkins University — Experiments show that when a PMMA block on a surface is normally loaded and driven by an external shear force, contact at the interface is modified in discrete precursor slips prior to steady state sliding.[1] Our simulations use an atomistic model of a rough two-dimensional block in contact with a flat surface to investigate the evolution of stress and displacement along the contact between surfaces. The talk will show how local and global stress conditions govern the initiation of interfacial cracks as well as the spatial extension of the cracked region. Inertia also plays an important role in determining the number and size of slips before sliding and influences the distribution of stresses at the interface. Finally, the geometry of surface asperities also influences the interfacial evolution and the total friction force. The relationship between the interfacial stress state and rupture velocity will also be discussed. [1] S.M. Rubinstein, G. Cohen and J. Fineberg, PRL 98, 226103 (2007)

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