

Abstract Submitted
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Superconductivity Dependent Friction in Superheated He Films

M. HIGHLAND, J. KRIM, North Carolina State University — We report a quartz crystal microbalance (QCM) study of sliding friction levels in N_2 , H_2O and superheated He films adsorbed on Pb(111) above and below its superconducting transition temperature. Our findings establish firmly that superconductivity dependent friction is present in a wide range, if not all, of adsorbed film systems that remain unpinned at 7K, and that on and off cycling of an externally applied magnetic field may impact friction. Changes in friction at the superconducting transition are observed to be greater for H_2O and N_2 than for the He films, consistent with a recent theory that attributed differences in electronic friction levels to the polarity of the adsorbate [L.W. Bruch, Phys. Rev. B. **61**, 16201 (2000)] . This work was supported by NSF and AFOSR.

M. Highland
North Carolina State University

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