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Sliding friction of adsorbed films on fullerene substrates with tunable conductivity[1] SAMUEL KENNY, JACQUELINE KRIM, North Carolina State Univ — Friction at the nanoscale is known to encompass phononic, electrostatic, conduction electronic and magnetic effects [1], with electronic contributions being less well characterized than phononic contributions. Experiments measuring friction and diffusion of adsorbed gases on superconductors, for example, have revealed a decrease in resistance of the film concomitant with a decrease in sliding friction, but the electrical properties were difficult to fine tune.[2] Since their discovery nearly thirty years ago, C_{60} and related compounds have been widely studied in the context of photovoltaic research and related photoconductive properties. As such, they constitute ideal systems for studies of sliding friction on substrates with variable electrical resistivity.[3] We report here our quartz crystal microbalance studies of the frictional properties of adsorbate molecules sliding on fullerene films irradiated by visible laser light so as to tune the electrical resistivity of the substrate. [1] J. Krim, Advances in Physics, 61 (2012) pp. 155-323. [2] M. Highland et al., PRL (2006). [3] A. Hamed *et al.*, PRB 47 (1993) pp. 10873-10880.

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