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Interparticle friction between gently contacting spheres[1] GREG FARRELL, NARAYANAN MENON, Dept of Physics, UMass Amherst — In previous experimental work we have found that the packing fraction of gently-sedimented monodisperse spheres is affected by particle roughness as well as the viscosity and buoyancy provided by the surrounding fluid. In order to provide a macroscopic quantification of the microscopic effects of particle surface and of the fluid, we have developed a new technique to measure the coefficients of static and kinetic friction between two spheres in a fluid. We find that even in fluid environments, there are static and kinetic coefficients of friction characteristic of solid-on-solid contact. Surprisingly, even for a given pair of spheres, we measure a broad range of friction coefficients corresponding to contacts made at different locations on the surface. Thus, even for lubricated surfaces, surface heterogeneity is more apparent for small normal forces than at familiar force-scales.

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