Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Direct measurement of modified drag coefficient for a colloidal particle near flat walls CHUNGIL HA, Lehigh University, HYUK KYU PAK, Pusan National University, H.D. OU-YANG, Lehigh University — For colloidal particles, the Stokes drag force is well known for particles in a virtually infinite reservoir of quiescent fluid, since boundary effects can drastically alter drag on the particle. To investigate the effects of a physical boundary on the drag force, we directly measured the hydrodynamic drag exerted on a particle for two different cases; near a single flat wall and sandwiched between two flat walls. Measurements of drag coefficients were made using a calibrated oscillating optical tweezer composed of two lasers, one for trapping and one for particle tracking. A lock-in amplifier used to detect the harmonically modulated particle motion allowed us to isolate the response of the particle to the tweezers force against the effects of Brownian motion. Results of measured drag coefficients are presented for both the single and two-wall cases as a function of particle separation from the wall, and are compared to the expected results from the rigorous hydrodynamic flow calculations.

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Date submitted: 20 Nov 2009 Electronic form version 1.4