Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Near wall dynamics of a large particle in a highly bidisperse colloidal solution[1] SUKALYAN BHATTACHARYA, Texas Tech University, JERZY BLAWZDZIEWICZ, Yale University, ELIGIUSZ WAJNRYB, IPPT Poland — Small particles (or macromolecules) added to a colloidal solution of much larger species produce the effective structural force acting between the large particles and the walls. When the large particles are moving, the macromolecules can also produce non-equilibrium effects, which include the hydrodynamic and Brownian resistance forces. Our talk will focus on these non-equilibrium phenomena for a large sphere near a planar wall in a dilute solution of much smaller spherical particles. The gap between the wall and large particle is of the order of the small-particle diameter. It is thus much larger than the size of the lubrication region, and our analysis relies on this length-scale separation. To find the hydrodynamic contribution to the resistance force we evaluate the induced-force distribution on a sphere in a gap between (locally) planar, parallel walls. The pressure field in the original system, where the gap width is slowly varying, is then obtained by solving lubrication equations with the source term corresponding to this induced force. The Brownian contribution is obtained in a similar manner.

[1]Supported by NSF grants CTS-0201131 and CTS-0348175 and NASA grant NAG3-2704

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Date submitted: 12 Aug 2005 Electronic form version 1.4