Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Rheology of Deformable Particle Suspensions by Dissipative Particle Dynamics ANUJ CHAUDHRI, JENNIFER R. LUKES, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania, PA 19104 — Understanding the behavior of colloidal suspensions, emulsions, and other complex fluids under shear flow is important in liquid crystal switching, lab-on-chip processing of biological fluids, self-assembly of polymer structures, and other areas of soft matter physics. Various analytical and computational approaches, including Brownian dynamics, dissipative particle dynamics, and Stokesian dynamics, have been applied to study the rheology of *rigid* particle suspensions. Still lacking are methods capable of treating suspensions containing *deformable* particles such as blood cells or macromolecules. Here we present a new, dissipative particle dynamics-based computational method with this capability. This method is used to calculate the shear rate dependence of viscosity for suspensions of deformable particles with varying stiffnesses.

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Date submitted: 01 Dec 2006 Electronic form version 1.4