

Abstract Submitted  
for the DFD05 Meeting of  
The American Physical Society

**The stress in a non-uniform suspension of heavy particles**<sup>1</sup> QUAN ZHANG, ANDREA PROSPERETTI, Johns Hopkins University — The ensemble averaged stress system in a non-uniform suspension of equal spheres subject to external forces or torques is considered. It is found that, as a consequence of the spatial non-uniformity of the system, new terms arise both in the symmetric and antisymmetric parts of the bulk stress. In particular, a new antisymmetric contribution is found even in the absence of external torques. All these terms depend on the particle volume fraction but are independent of the particle size. At low concentrations these results are established by a new formulation of the renormalization technique while, at finite concentrations, a combination of ensemble averaging and numerical simulation is used.

<sup>1</sup>Supported by DOE

Andrea Prosperetti  
Johns Hopkins University

Date submitted: 10 Aug 2005

Electronic form version 1.4