

Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Effective viscosity of 2D suspensions - Confinement effects

PHILIPPE PEYLA, STEPHANE PRIEM, DOYEUX VINCENT, University Joseph Fourier, ALEXANDER FARUTIN, University Joseph Fourier - CNRS, MOURAD ISMAIL, University Joseph Fourier — We study the rheology of a sheared 2D suspension of non-Brownian disks in presence of walls. Although, it is of course possible today with modern computers and powerful algorithms to perform direct numerical simulations that fully account for multiparticle 3D interactions, the analysis of the simple case of a 2D suspension, provides valuable insights and helps to understand 3D results. For instance, we examine the role of particle-wall and particle-particle interactions in determining the rheology of confined sheared suspensions. In addition we evaluate the intrinsic viscosity as well as the contribution of hydrodynamic interactions to the dissipation as a function of a wide range of confinements. Thanks to the direct visualisation of the whole 2D Stokes flow, we are able to give a clear interpretation about the rheology of semi-dilute confined suspensions.

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Date submitted: 09 Jul 2014

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