

Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Collective dynamics in suspensions bounded by two planar walls via a new accelerated Stokesian-dynamics algorithm¹ JERZY BLAWZDZIEWICZ, Yale University, ELIGIUSZ WAJNRYB, IPPT PAN, Warsaw, Poland — Our novel accelerated Stokesian-dynamics algorithm for a system of spherical particles bounded by two parallel planar walls serves to efficiently follow the dynamics of about 10^3 particles. Its high efficiency is due to simplifications associated with the far-field asymptotics of the scattered flow produced by the particles. By a proper choice of basis Stokes flows (which in the near field tend to Lamb solutions and in the far field to multipolar basis of Hele-Shaw flows), the problem is reduced to a sparse linear system that is solved at a low numerical cost using iterative sparse-matrix manipulation techniques. We also present applications of our algorithm to study suspension transport in microfluidic channels and collective motion of large regular particle arrays in Poiseuille flow.

¹Work supported by NSF CAREER grant CTS-0348175.

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Date submitted: 04 Aug 2007

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