

Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

The motion of an ellipsoid particle in Hagen-Poiseuille flow¹ ANTOINE DECHAUME, PETER MINEV, Department of Mathematical and Statistical Sciences, University of Alberta, 677 Central Academic Building, Edmonton, Alberta, T6G 2G1, Canada, WARREN FINLAY, Department of Mechanical Engineering, University of Alberta, Mechanical Engineering Building, Edmonton, Alberta, T6G 2G8, Canada — The motion of solid particles in shear flows is crucially important in many situations, here we focus on an ellipsoid particle in Hagen-Poiseuille flow. The coupled motion of the fluid and particle is solved numerically with a non-Lagrange multiplier version of the fictitious domain method. The key idea of these methods is to fill the particle with fluid and impose rigid body as a side constraint, thus avoiding the remeshing of the fluid domain at each time-step. The motion of the particle depends on several parameters, such as the initial position and orientation, Reynolds number, relative density, orientation of gravity, aspect ratio and size of the particle. Different kind of motions are encountered, from tumbling and oscillating, to Segre-Silberberg migration, which are compared to the spherical particle case as well.

¹This study has been supported by the Special Research Opportunity Grant (NSERC).

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Date submitted: 06 Aug 2007

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