Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Particle ordering in inertially focused microfluidic flows KATHERINE HUMPHRY, Department of Physics, Harvard University, PANDURANG KULKARNI, Levich Institute and Department of Chemical Engineering, City College of the City University of New York, DINO DI CARLO, JON EDD, MEHMET TONER, BioMEMS Resource Center, Massachusetts General Hospital, JEFFREY MORRIS, Levich Institute and Department of Chemical Engineering, City College of the City University of New York, DAVID WEITZ, Department of Physics & School of Engineering and Applied Sciences, Harvard University, HOWARD STONE, School of Engineering and Applied Sciences, Harvard University — We study inertially driven focusing of particles [1], which has recently been exploited in a controlled fashion in microfluidic devices [2]. In particular, we characterize the focusing as a function of particle and channel Reynolds number by reporting particle position in directions perpendicular to the flow, and a large distance from the fluid inlet. Focusing of dilute suspensions leads to a linear arrangement of particles whose spacing is primarily a function of concentration and channel aspect ratio. All results are compared with simulations, which provide mechanistic insights into particle behavior.

[1] G. Segré and A. Silberberg, Nature **189**, 209 (1961).
[2] D. Di Carlo, D. Irimia, R. G. Tompkins, and M. Toner, Proc. Nat. Acad. Sci. U.S.A. **104**, 18892 (2007).

Howard Stone
School of Engineering and Applied Sciences, Harvard University

Date submitted: 31 Jul 2008 Electronic form version 1.4