

Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Dissipative interactions between particles in shear flow¹ MARINA POPOVA, PETER VOROBIEFF, MARC INGBER, The University of New Mexico, ALAN GRAHAM, Los Alamos National Laboratory — We present an experimental study of a low-Reynolds number shear flow carrying particles. The flow is nearly two-dimensional due to stable stratification of the fluid, with the particles occupying a planar neutral buoyancy layer. While both the two- and three-particle interactions show a degree of irreversibility, the three-particle interactions demonstrate apparently chaotic behavior, where small variations in the initial conditions of the experiment (i.e., particle positions) lead to large changes in the final state of the experiment. Moreover, a detailed knowledge of the trajectory of each particle in the triplet is required to relate the final particle order to the initial positions. Results of experiments with particles of different shapes (spherical, ellipsoid, etc.) are also discussed.

¹This research is sponsored by the US Department of Energy.

Peter Vorobieff
The University of New Mexico

Date submitted: 07 Aug 2007

Electronic form version 1.4