Phase portrait of irreversible low-Reynolds number flow[1] GUAN-DONG ZHU, MARINA POPOVA, MARC INGBER, PETER VOROBIEFF, The University of New Mexico — We present a computational and experimental study of a two-dimensional shear flow carrying spherical particles. While the Reynolds number characterizing the problem is very small, dissipative interactions between the particles lead to irreversibility and apparent chaos. We use experimental results as the starting point for a numerical simulation of such irreversible interactions within a three-particle system, investigating its phase space by introducing subtle changes to the initial positions of the particles. Our simulation uses traction-corrected boundary element method (TC-BEM) and reveals a surprisingly rich behavior in good agreement with experiment.

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Date submitted: 03 Aug 2008   Electronic form version 1.4