Abstract Submitted for the DFD06 Meeting of The American Physical Society

Is there a threshold for irreversibility in sheared suspensions? MARCUS ROPER, MICHAEL P. BRENNER, DEAS, Harvard University, AR-MAND AJDARI, ESPCI, Physico-Chimie Théorique — Recent experiments (Pine *et al.*, Nature 2005) have identified a finite-shear amplitude transition to irreversible motion for the particles in a periodically sheared suspension – apparent evidence for the finite-shear-amplitude onset of chaotic dynamics. We present an alternative explanation in which the irreversibility persists down to arbitrarily weak shear amplitudes, highlighting the roles played by long-lived clusters of particles in nearcontact and by the particular conditions under which the experimental system is prepared.

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Date submitted: 04 Aug 2006

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