

Abstract Submitted  
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**Effect of roughness in periodically sheared clouds of particles** PHONG PHAM, University of Florida - Gainesville, BLOEN METZGER, IUSTI-CNRS UMR 7343, Aix-Marseille University, France., JASON BUTLER, University of Florida - Gainesville, IUSTI-CNRS UMR 7343, AIX-MARSEILLE UNIVERSITY, FRANCE. COLLABORATION, UNIVERSITY OF FLORIDA - GAINESVILLE COLLABORATION — We investigate experimentally the evolution of small clouds of non-Brownian particles submitted to a periodic shear under low Reynolds number conditions. The particle motion is irreversible during the first cycle. Beyond that, the particle motion is reversible. We find that the amount of irreversibility increases as the particle roughness is increased. An accurate prediction of the particles' trajectories is obtained with a minimal model including normal lubrication and a frictionless contact force. These experiments provide evidence that, in viscous flows, contacts between particles occur and strongly influence the particle dynamics.

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