Abstract Submitted for the DFD15 Meeting of The American Physical Society

**Relaxation of densely packed gel particles under cyclic shearing** J.C. TSAI, Inst. of Physics, Academia Sinica, M.R. CHOU, P.C. HUANG, NTU, H.T. FEI, Inst. of Physics, Academia Sinica, J.R. HUANG, National Taiwan Normal University — We study experimentally the rheological response of fluid-immersed hydrogel particles. The particles are centimeter-sized and are driven by a roughened cone-shaped upper boundary, which imposes a cyclic shearing with a substantial stall period inserted between each reversal of its motion. The stall period reveals a characteristic timescale of relaxation belonging to these soft materials, in contrast to the build-up of stress that reflects a characteristic strain accumulated since each re-start of the shearing. We provide a coherent explanation on how the relaxation and the residual stress are related to observed steady-state rheology at different strain rates, and the use of a previously developed tomographical imaging technique allows us to look into the particle displacements during the relaxation.

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Date submitted: 01 Aug 2015

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