Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Concentration and velocity measurements in non-Brownian suspensions using ultrasonic imaging BRICE SAINT-MICHEL, Ecole Normale Suprieure, Lyon, HUGUES BODIGUEL, STEVEN MEEKER, Laboratoire du Futur, Bordeaux, SBASTIEN MANNEVILLE, Ecole Normale Suprieure, Lyon — We investigate the sedimentation and the re-suspension of dense, non-Brownian particles using ultrasonic imaging in a Couette cell, coupled to rheological measurements. Our setup records the characteristic speckle signal originating from the multitude of particles (PS, PMMA, glass) in the Couette cell scattering an initial ultrasound pulse on a transducer array. This speckle map can be used to estimate the velocity field and the particle concentration in our cell. We will discuss the advantages and limitations of our device using canonical examples when the suspending fluid is Newtonian: viscous re-suspension, sedimentation, particle migration by centrifugal forces and in Taylor vortices. Finally, some results involving non-Newtonian suspending fluids will be presented.

Brice Saint-Michel
Ecole Normale Suprieure, Lyon

Date submitted: 24 Jul 2015 Electronic form version 1.4