Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Segregation and mixing in bidisperse liquid-fluidized suspension ANGÉLIQUE DEBOEUF, GEORGES GAUTHIER, JÉRÔME MARTIN, DOMINIQUE SALIN, Laboratoire FAST — We study experimentally the fluidization of a bidisperse suspension of macroscopic particles (100 to 160 microns for the smallest beads and 180-200 microns for the largest glass beads), at low Reynolds number. With the help of an acoustic scanner, the measurement of the sound propagation (velocity and attenuation), is continuously recorded along the bed. Those measurements are linked to the concentrations of the particles, and provide the composition, in time, of the suspension along the vertical axis. In our system, one may expect a segregation process induced by the different settling velocities, which should result in a stationary segregated state: a monodisperse suspension of small particles fluidized on top of a monodisperse suspension of large particles, with a transition zone enlarged by the mixing of particles due to hydrodydamic dispersion. However, for some concentration and ratio of beads diameter, no stationary state has been observed in our experimental system: our fluidized bidisperse suspension exhibits oscillations between segregated and homogeneous states.

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Date submitted: 31 Jul 2008 Electronic form version 1.4