

Abstract Submitted  
for the DFD08 Meeting of  
The American Physical Society

**Particle Velocity Fluctuations in a Liquid Fluidized Bed** OLIVIER MASBERNAT, ALICIA AGUILAR CORONA, Laboratoire de Genie Chimique CNRS/Universite de Toulouse, France, ROBERTO ZENIT, Instituto de Investigaciones en Materiales, UNAM, Mexico, OLIVIER SIMONIN, Institut de Mecanique des Fluides de Toulouse, 5502 CNRS/Universite de Toulouse, France — The random motion of solid particles in a liquid fluidized bed has been investigated using high speed video, in the range of high particle Reynolds and moderate Stokes number. Matching the refractive index of both phases allows the recording of a single colored particle 3-D trajectory within the bed. The particle velocity *pdf* and variance following the particle motion have been derived for each velocity component, in a wide range of solid fraction. Instantaneous velocity signal is composed of large amplitude low frequency fluctuations and small amplitude fluctuations at higher frequency. The large scale motion is much more pronounced in the longitudinal direction than in the transverse one, resulting in a significant anisotropy of the fluctuating motion. For each component, the velocity *pdf* is centered on zero and can be well fitted by a Gaussian distribution at low to moderate solid fraction. The velocity variance of each component is found to be a decreasing function of the sold fraction. These results have been interpreted in the frame of an averaged statistical model derived from kinetic theory of granular media.

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Date submitted: 02 Aug 2008

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