

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Self-diffusion of particles in gas-driven granular layers with periodic flow modulation¹ CARLOS ORELLANA, Departamento de Fisica, Universidad de Chile, Santiago, Chile, IGOR ARANSON, WAI KWOK, Argonne National Laboratory, SERGIO RICA, Departamento de Fisica, Universidad de Chile, Santiago, Chile — We study particles self-diffusion in gas-driven granular layers by high-speed fluorescent video-microscopy. We show that periodic flow modulation results in an enhancement of the particle's diffusion. The diffusion enhancement, which in turn is an indication of more efficient fluidization of the granular layer, is associated with the onset of disordered sub-harmonic patterns. Our measurements provide a sensitive characterization method of the fluidization properties of particulate/gas systems.

¹This research was supported by US DOE, contract #W-31-109-ENG-38.

Igor Aronson
Argonne National Laboratory

Date submitted: 28 Nov 2005

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