Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Flux from a vibrated granular medium KE CHEN, MATTHEW STONE[1], RACHEL BARRY, MATTHEW LOHR, WILLIAM MCCONVILLE, Dept. of Physics and Materials Research Inst., Penn State University, KIT KLEIN, Dept. of Computer Engr., Penn State University, BEN-LI SHEU, Dept. of Physics and Materials Research Inst., Penn State University, ANDREW MORSS[2], Dept. of Physics and Materials Research Institute, Penn State University, THOMAS SCHEIDEMANTEL, PETER SCHIFFER, Dept. of Physics and Materials Research Inst., Penn State University — We have studied vertically vibrated granular media by measuring the flux through a hole in the container's bottom surface. We find that when fully fluidized, the flux is controlled by the peak velocity of the vibration, v_{max}, i.e., the flux is nearly independent of the frequency and acceleration amplitude for a given value of v_{max}. The flux decreases with increasing peak velocity and then becomes constant for the largest values of v_{max}. We demonstrate that the data at low peak velocity can be quantitatively described by a hydrodynamic model. By contrast, the nearly constant flux at larger peak velocity signals a crossover to a state in which the granular density near the bottom is insensitive to the energy input to the system. This research was supported by the NASA through grant NAG3-2384 and the NSF REU program through grant DMR 0305238.

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Date submitted: 13 Feb 2006 Electronic form version 1.4