Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Application of a Particle-Substrate Model to a Two-Dimensional Driven Granular System MEENAKSHI DUTT, Department of Materials Science and Metallurgy, University of Cambridge, UK, ROBERT BEHRINGER, Department of Physics, Duke University, USA — We discuss a numerical model which accounts for collisional and surface frictional dissipation, and their influence on particle dynamics for a quasi 2-dimensional cooling granular material (Painter, et al. Physica D (2003); Dutt, et al. Phys. Rev. E (2004); Dutt, in preparation) confined to a substrate. This model has been further extended to study a horizontally vibrated particle-substrate system. We show that the ratio of the substrate acceleration to the particle-substrate static frictional force (Kondic, Phys Rev. E (1999)) dominates the individual particle dynamics and the collision dynamics. This, in turn, affects the time evolution of averaged dynamical variables, for example, the mean velocity and the center of mass position vector. We will present results from our numerical experiments which further higlight the critical role of static friction, relative to the driving acceleration.

Meenakshi Dutt
University of Cambridge

Date submitted: 10 Aug 2005 Electronic form version 1.4