

Transverse Motion, Segregation and Rotations in 2D Granular Flows

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We present experimental studies of two dimensional dense flows consisting of both monodisperse and bidisperse disks. We compare results obtained from chute flow experiments to those produced on an air table with the same kind of particles. In both cases experiments are recorded by a high speed video camera. Image processing software computes the exact position of the center of the disks and their rotation angle, allowing one to extract the trajectories and kinematic properties. We observed fully developed, dense shear flows of constant packing fraction. We present here the general features of monodisperse and bidisperse flows in terms of average and variance of the distribution of velocity (angular and center velocities). We discuss the concept of granular temperature, introduced in the kinetic theory, relatively to the lack of equipartition of energy. We analyze in detail the transverse motion of particles and segregation process through the transverse motion of the small particles.

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