Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Surface Flow of Sloshing Granular Materials KENNETH DESMOND, Rochester Institute of Technology, WOLFGANG LOSERT, MIKE NEWEY, University of Maryland — We studied the fluidity of the flowing layer of grains in a tumbler through gentle sideways sloshing, and how the flow of large and small particles differs. Monodisperse beads were rotated in a long partially filled drum while also being gently vibrated sinusoidal below one g along the axial direction. As a result of the motion of the drum the beads slosh slightly back and forth also with sinusoidal motion. We compared the phase difference between the motion of the drum and the particles for big and small particles. It was determined that the phase difference is directly proportional to the frequency of vibration with a proportionality constant that increased with fluidity. The proportionality constant is a measure of the fluidity of the grains, and was shown to scale with the logarithm of rotation rate and the inverse square root of the bead diameter.

Kenneth Desmond
Rochester Institute of Technology

Date submitted: 15 Aug 2005 Electronic form version 1.4