Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Relationships between Voronoi Volume Shapes and Particle Motions in a Granular material subject to Thermal Cycling STEVEN SLOTTERBACK, LEONARD GOFF, University of Maryland-College Park, MASAHIRO TOIYA, Brandeis University, WOLFGANG LOSERT, University of Maryland-College Park — We gently compact a granular pile using a temperature cycling process to expand and contract the holding vessel. We use a laser sheet scanning method to find the centers of the individual granules to within $\sim$1% accuracy after each cycle. We analyze the voronoi diagrams for all the particles in each cycle. We observe that the distributions of voronoi volumes do not change significantly as the pile compacts, and they agree with distributions found by Aste et al[1]. We also observe correlations between the shapes of voronoi cells around individual particles and their subsequent motions. [1] T. Aste *et al* 2007 *EPL* **79** 24003 (5pp).

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Date submitted: 03 Aug 2007 Electronic form version 1.4