

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Characterizing the clogging transition by individual grain behavior CHARLES THOMAS, DOUGLAS DURIAN, University of Pennsylvania — Granular media clogs as it flows out of a hopper when the exit hole is appropriately small. However, when the hole is enlarged, the grains will never clog: there exists a well-defined transition between these two regimes at a particular critical hole size. To understand the origin of this clogging transition we follow the behavior of individual grains in the bulk. Using a quasi-2D hopper and a fast CCD, we can measure the positions of grains to sub-pixel accuracy. We then use this information to determine various local and global properties, including strain rate, velocity correlations, and dynamical heterogeneity time scales. We study how these quantities depend on the distance to the clogging transition, defined as the difference between the hole size and the critical hole size. This helps to explain the clogging transition and its relationship to the jamming transition.

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Date submitted: 09 Nov 2011

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