Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Low-frequency oscillation in a narrow vibrated granular system
LORETO OYARTE GLVEZ, DEVARAJ VAN DER MEER, University of Twente —
The analogy of the behaviour of granular materials with that of fluids has motivated much appealing research. An important example is a vertically shaken granular bed which exhibits fluid-like behavior, such as the Leidenfrost effect where a dense layer of grains floats on top of a gaseous layer, just like when a liquid droplet floats on its own vapour above a hot plate. When the shaking energy is increased the granular bed transits from the Leidenfrost to the convection state, for which a precursor is expected in the form of an oscillation of the bed as a whole. This precursor was observed numerically like an oscillation in the motion of the dense part, where the frequency of this oscillation is much lower than the frequency of the injected energy, and appears more relevant when the system is getting closer to the convective state. We built a setup that permits the observation of the granular Leidenfrost effect for a wide range of driving parameters. More specifically, a monodisperse granular material is contained in a transparent box and vertically shaken, and a fast camera is used to study its dynamics. The presence of a LFO is directly measured by images analysis and shows a good agreement with the previous numerical and experimental works.

Loreto Oyarte Glvez
University of Twente

Date submitted: 31 Jul 2015 Electronic form version 1.4