Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Modeling granular inclined plane flow phenomena with Nonlocal Granular Fluidity KEN KAMRIN, MIT, DAVID HENANN, Brown University — The continuum theory of Nonlocal Granular Fluidity (NGF) has previously been shown to predict steady granular flow fields in many different geometries, including those such as split-bottom cells, which have been historically resistant to continuum modeling. Central to NGF is a direct inclusion of a particle length-scale, which renders the rheology nonlocal, capturing the cooperatively of granular motion. In this talk we demonstrate that the same model also captures the behaviors observed in granular inclined plane flows. We show that the model predicts a quantitatively accurate "stopping curve" which indicates the conditions that determine when a flowing layer comes to a stop, which depends explicitly on the thickness of the layer. We also explore other known phenomena in this geometry, such as the dependence of the flow profile on layer thickness, the collapse of the Froude number as a function of thickness vs the stopping height, and the possibility of modeling both starting and stopping curves within the same model.

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Date submitted: 14 Nov 2014 Electronic form version 1.4