

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Column Collapse of Rod-like Granular Materials MELISSA
TREPANIER, SCOTT FRANKLIN, Rochester Institute of Technology — We study
the collapse of piles of rod-like granular materials, in particular how the particle as-
pect ratio (length/width) and coefficient of friction affect the runoff. Rod particles
can maintain the shape of their container, something round particles cannot, and
we find transitional pile heights that determine the onset of collapse. For low aspect
ratios, pile heights of less than a particle length do not collapse, implying that ver-
tically oriented rods are anchoring the pile and providing stability. There is a broad
transition range of pile heights in which the probability of collapse grows linearly
from 0 to 1. The scaling of the runoff distance in and above this region is indepen-
dent of aspect ratio and friction, depending only on the initial pile geometry. This
work could have significant implications for construction of stable structures and
understanding avalanches of needle-like snow crystals (hoar).

Melissa Trepanier
Rochester Institute of Technology

Date submitted: 20 Nov 2009

Electronic form version 1.4