Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Retrogressive failure of a layer of granular material on an inclined plane AARON RUSSELL, NICO GRAY, CHRISTOPHER JOHNSON, SYLVAIN VIROULET, The University of Manchester — The flow of granular materials down an inclined plane is closely related to many natural hazards, such as landslides and avalanches, which can cause serious damage to life and property. Avalanches can be triggered by many different factors, such as human activities, new material falling, wind or earthquakes. When an avalanche is triggered by a local disturbance, it is not only material downstream of this disturbance that is dislodged. Material upslope of the disturbance may also collapse, through an upwards propagating erosion wave through the granular layer, or 'retrogressive failure', which separates the regions of flowing and static material. This retrogressive failure is critically dependent on physics beyond the $\mu(I)$-rheology and, despite being one of the basic waves in granular flow, has not been modelled in detail before. We use small scale lab experiments, novel theory and numerical simulations to model retrogressive failure, and apply our results to both geophysical and industrial contexts.

Aaron Russell
The University of Manchester

Date submitted: 10 Nov 2016 Electronic form version 1.4