

Abstract Submitted
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Bidisperse granular flows on inclined rough plane C. GOUJON, B. DALLOZ-DUBRUJEAUD, N. THOMAS, IUSTI-Marseille, France — Experiments on bidisperse dry granular flows on a rough inclined plane were performed in order to investigate its rheology. Flows, created by a localised input of granular matter onto the plane, propagate and spread laterally, being unconfined by the experimental set-up. Because of size segregation, small beads are found in a layer at the bottom of the flow and larger ones at the free surface, at the borders and at the front. These lateral and vertical inhomogeneous repartitions lead to two effects: the surround effect and the interface effect. The surround effect is due to the large beads at the front and borders of the flow. It can be interpreted considering the relative frictions of the two types of beads with the rough plane. We show that a maximum of the friction exists for a particular relative roughness. Depending on the values of relative frictions, obtained for monodisperse flow, the surround effect can lead to a narrowing of the bidisperse flow, an increase of the deposit thickness. The interface effect deals with the interaction between the layers of large and small beads. Depending of the size ratio between the beads, the large beads can be “trapped” in the deposit of small ones, or they can increase the velocity gradient in the layer of the small beads, by an entrainment phenomenon. The combination of these two effects results in the different behavior observed for bidispersed granular deposits, compared to those observed for monodisperse flows.

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