



Size segregation and granular mass flow properties: a numerical study

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The sediments that form the surface of the Earth range from very fine particles to large boulders; their mean size covers several orders of magnitude. In the context of granular mass motion, this disparity of sediment size is the cause of a long-lasting scientific issue: the role of size segregation in the flow properties. This issue is all the more challenging that size segregation affects the bulk, the boundary conditions and the shape of the flow simultaneously, making it difficult to discriminate between the three different aspects. Yet in the perspective of continuum modeling, it is crucial to understand the respective role of segregation patterns and modified flow properties.

In this contribution, we analyze the behavior of model granular chute flows in two dimensions using discrete numerical technics. Our interest focuses on the back control of segregation on the flow frictional properties. We quantify the influence of the flow composition on the rheological properties, and conclude on the advent of segregation-induced lubrication in natural contexts.