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**Runout Transition Bidimensional Dumbbell-Like Rock Avalanches** LUIS ARMANDO TORRES-CISNEROS, GABRIEL PEREZ-ANGEL, CINVESTAV-IPN, YURI NAHMAD-MOLINARI, ROBERTO BARTALI, GUSTAVO MANUEL RODRIGUEZ-LINAN, Universidad Autonoma de San Luis Potosi, Instituto de Fisica, FISICA APLICADA, CINVESTAV-IPN TEAM, LABORATORIO DE MATERIA GRANULAR, UASLP TEAM — Experimentally is found that a flow composed by monodisperse sample of rocks, for sizes ranging from 1mm to 2cm show an exponentially increasing behavior in runout vs particles size plot. Furthermore we show that this tendence is independent of the amount of falling matter, when it falls from the same heigth. Moreover we show using two-dimensional molecular-dynamics simulations, that the runout changes with the amount of matter falling, and there is a change from an exponentially increasing function to a constant one when we multiply by two the total mass, and multiplying again the total mass by two results in an exponentially decreasing behavior. This shows a well defined transition in the runout vs particle size plot when we increase the amount of matter in the flowing avalanche. The main hypothesis to explain this contradictory result is that the change of transversal length when the flow pass from the flume to the floor zone is not reproducible in a 2D simulation. We also characterize the flow computing the energy and the power dissipated.

Luis Armando Torres-Cisneros
CINVESTAV-IPN

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