



Experiments on rapid granular avalanches interacting with dams : energy dissipations and impact forces

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Small-scale laboratory experiments on rapid granular avalanches interacting with a vertical dam were carried out. A reference avalanche was first defined mainly by its incoming Froude number and its maximum run-out. Then a vertical dam was set-up on the granular flow and its height was varied. We measured both the run-out shortening due the dam and the impact forces on the dam. The impact forces measurements allowed quantifying the drag coefficient on the one hand. The local energy dissipation coefficient was indirectly estimated from the run-out shortening on the other hand. It was shown that the energy dissipation coefficient and the drag coefficient were strongly correlated by the obstacle height normalized by the incoming flow depth. This result indicates that rapid granular flows (inertial regime) interacting with obstacles can be treated by similar methods that those used for turbulent hydraulic flows.