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Insight into the dynamics of granular column collapse using Discrete Element Methods and laboratory experiments

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The mechanical behavior of granular flows is still an open issue. In particular, quantitative agreement between the detailed dynamics of the flow and laboratory experiments is necessary to better constrain the performance and limits of the models. We propose here to compare *quantitatively* the flow profiles and the force during granular column collapse simulated using Discrete Element Models and laboratory experiments. These small scale experiments are performed with dry granular material released initially from a cylinder on a sloping plane. The flow profiles and the acoustic signal generated by the granular impacts and stresses on the plane are recorded systematically [*Farin et al.*, 2015]. These experiments are simulated using the Discrete Element Method Modys [*Richard et al.*, 2000]. We show that the effect of the removing gate should be taken into account in the model in order to quantatively reproduce the flow dynamics. Furthermore we compare the simulated and observed acoustic signals that are generated by the fluctuating stresses exerted by the grains on the substrate in different frequency bands.

[1] P. Richard et Luc Oger. 2000 *Etude de la géométrie de milieux granulaires modèles tridimensionnels par simulation numérique.*

[2] Farin, M., Mangeney, A., Toussaint, R., De Rosny, J., Shapiro, N., Dewez, T., Hibert, C., Mathon, C., Sedan, O., Berger. 2015, *Characterization of rockfalls from seismic signal: insights from laboratory experiments*