

Measuring granular flow properties to calibrate DEM simulations

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ABSTRACT

Tuning the microscopic parameters (coefficients of friction, coefficients of restitution, cohesive forces, ...) for granular material simulation is a difficult task, in particular when dealing with real powders made of grains having complex characteristics. Moreover, in many simulation techniques, the input parameters are not rigorously linked with physical parameters.

Measurements can be performed at the scale of the grains with AFM techniques for example to obtain a microscopic characterization. Even if this bottom-up method makes sense conceptually, it is often practically impossible to use this approach in applications.

We propose a top-bottom method based on a macroscopic characterization workflow [1] composed of three measurements: the packing fraction dynamics (GranuPack), the cohesiveness (GranuDrum) and the flow in a silo (GranuFlow). These measurements are performed in well-known geometries (tubes or rotating drum) and can be easily simulated. Therefore, the experimental results can be compared with the simulations to make a validation of the selected parameters. After a description of the measurement workflow, case studies are presented.

REFERENCES

- [1] G. Lumay, F. Boschini, K. Traina, S. Bontempi, J.-C. Remy, R. Cloots and N. Vandewalle , *Measuring the flowing properties of powders and grains*, Powder Technology 224, 19 (2012)