MODELLING COHESIVE GRANULAR FLOWS
100 - FRACTURE, DAMAGE AND FAILURE MECHANICS
300 - MULTISCALE AND MULTIPHYSICS SYSTEMS
1600 - GEOMECHANICS AND NATURAL MATERIALS

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ABSTRACT

Granular matter is omnipresent in many manufacturing processes, industrial or agronomical, and ubiquitous in geomechanics as well as in natural processes. Yet, although the science of granular matter has seen considerable progresses the last two decades, many real-life systems escape understanding or modelling. A major difficulty is the inclusion of realistic contact properties, among which cohesion is a key ingredient. Be it of electrostatic, magnetic, Van der Waals, chemical or capillary origin, its effect on the properties of granular flows or structures are momentous, allowing it to remain partially or fully static, or causing the apparition of long-lasting or intermittent solid-like mesoscale structures. This makes the reliable characterisation of the rheology of cohesive flows a serious scientific challenge, and a long lasting obstacle to the predictability of natural processes (snow avalanches, slope stability), or to the feasibility of many industrial processes handling granular raw material.

The main objective of this mini symposium is to provide an overview of the current progresses of the research on cohesive powders and granular media. Numerical contributions either applying discrete methods (DEM, Contact Dynamics) or continuum methods to reproduce the behaviour of cohesive granular systems are welcome. Experimental works shading new lights on the properties of cohesive flows, with tentative numerical modelling, are also encouraged.