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# DISCRETE SIMULATIONS OF GRANULAR MATERIALS

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## ABSTRACT

The Discrete Element Method (DEM) is a widely used computational method for modelling granular materials which considers interactions between individual particles. DEM has a high computational cost; however, continued advances in numerical algorithms, together with the increased computational power available, have made large simulations feasible. Beyond improvements in performance, significant improvements are continuously made on aspects of DEM that are related to the mechanics of granular materials. These include the use of more realistic contact models, especially in the case of cohesive granular materials, and the ability to perform simulations with different, non-spherical particle shapes. Finally, a major avenue for further exploitation of the method is the coupling of DEM with other numerical methods, e.g., to model the interaction of granular materials with rigid or deformable structures. This has led to the creation of a multitude of couplings of DEM, such as with the Finite Element Method, Multibody Dynamics, CFD simulations and Lattice-Boltzmann simulations.

This mini-symposium encompasses all the above aspects of current DEM research (improved algorithms, more realistic mechanics and coupling with other numerical codes). It is expected that this mini-symposium will attract considerable interest from the community, so as to allow separate sessions of the mini-symposium to target two different types of granular materials, that is soils (and in general geomaterials) and industrial bulk solids.

The principal objective of the mini-symposium is to provide a venue for researchers active in the field of DEM to present their most recent research work, and in turn hear about the latest developments in the field. While there exist various specialised conferences on discrete simulations and on granular media (such as Particles, Powders & Grains, WCPT, Partec, etc.), the joint ECCM and ECFD present the challenge and the opportunity of attracting the interest and engaging with the wider computational mechanics community. This can potentially lead to a higher visibility for the research in DEM and to fruitful exchange of knowledge with researchers in other computational methods.