Research

Mechanics Seminar

Simulating Cohesive Granular Matter: Stability? Pattern? Failure?

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Microsoft Teams - https://tinyurl.com/48fqbv82

Abstract.

After years of research efforts, dry granular matter has yielded some clues about its behaviour. Wet granular matter, powders, or any grains which tend to stick to each other, forming the class of "cohesive granular matter", has not yet said as much about the way it stands, deforms, fails or flows. Although it is central in many processes, from civil engineering, to food or drugs industry, the knowledge we use is essentially based on phenomenological observations, from which deriving physical properties is difficult. In this seminar, we discuss about, and give an illustration of how numerical simulations, both discrete and continuous, can bypass some of the difficulties. By allowing easy parametric studies, it guides us towards better understanding the links between the grains cohesive properties and the macroscopic behaviour. Moreover, it offers an easy tool to experiment with candidate characterisation of the properties of the granular mass. After a short introduction, we present here a stability analysis, followed by a tentative quantification of the cohesion through the roughness pattern of the deposits, and a characterisation of the failure plane.