

## PARTICLE-BASED METHODS FOR CEMENTED GRANULAR MATERIALS

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### ABSTRACT

This session invites researchers and practitioners to explore the domain of particle-based methods for the simulation of cemented granular materials. The focus is on the latest advancements of these methods in understanding the complex behaviour of such materials, as well as on their application to engineering.

Cemented granular materials, which include sandstone, concrete, asphalt, and natural soils, play a crucial role in numerous engineering applications. Their mechanical behaviour is highly complex due to the interactions between individual particles and the cementing matrix. Traditional continuum-based simulation methods often struggle to accurately capture this behaviour due to the difficulty of including the rich geometric information contained in the contact networks.

Particle-based methods, which do not require a prior homogenised description of the granular medium, offer a powerful alternative. These methods model the material as a collection of discrete particles, allowing for a more accurate representation of the microscale interactions and mechanisms that govern the overall behaviour of cemented granular materials.

In this session, we will delve into the theoretical foundation of various particle-based methods, discuss the implementation details in their application in computational mechanics, and showcase their potential in simulating the behaviour of cemented granular materials in practical scenarios. We will also address the challenges associated with these methods and explore potential solutions.