

## Boundary interactions in three-dimensional granular flows

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Granular materials are complex fluids that experience many cooperative phenomena. In the presence of lateral confinement, which is the case for the vast majority of industrial, as well as natural flows, these phenomena are exacerbated and the 3D structure of the flows becomes predominant. This makes the theoretical description of confined granular systems particularly difficult while the latter is often restricted to one-dimensional systems in the literature.

The objective of this talk is to review the granular flow configurations where the boundaries play a crucial role and give rise to complex three-dimensional flows and strong anisotropy of the stress tensor. We will also present the limit of the available theoretical and phenomenological approaches to describe granular flows in complex geometries close to industrial and natural situations. At the present time, there is no available theoretical model including both a three-dimensional tensor constitutive law and a realistic description of the boundary conditions.