

Static & Dynamic Response of Granular Media

Leo Silbert
DLR



Determining the mechanical robustness of granular solids persists as a poorly understood problem in the mechanics of granular matter. What is clear is that a granular medium can appear to behave not only as a mechanically stable continuous elastic solid but can also exhibit strongly non-linear features characterised by highly heterogeneous stress properties. Using large-scale computer simulations of model granular particles subject to localised force perturbations, we show that the static stress response of a granular pile exhibits a transition between different mechanically responsive phases characterized by critical-like features, where friction is a key control parameter. We then turn our attention to the dynamics of an intruder in jammed solids and map out the dynamic response due to a driven probe particle. The talk will end with some highlights of recent developments in granular dynamics simulation capabilities.

