

# How do granular materials deform ? An experimental and numerical study at the grain scale

Michalis KOMODROMOS PhD (2023-2026) michail.komodromos@univ-grenoble-alpes.fr Supervision: Gaël COMBE, Vincent RICHEFEU, Cino VIGGIANI Funding: Grenoble INP

#### Facts:

Reality: Soils composed of discrete particles assemblies

Geotechnics: Soils approached by classic continuum mechanics, enriched with plasticity

### **Evidence:**

Continuum predictions vs experimental results: granulence

Statistical mechanics: blend more physics in geomechanics

Non extensive scaling laws: internal lengths in confined granular media

# Experimental Investigation in 2D (1γ2ε)

Statistical analysis of image derived kinematic fields

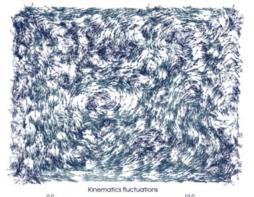
# Numerical Investigation in 3D (DEM)

Statistical analysis of numerically derived kinematic fields









J

Σ