



Mechanics of localized compaction in granular rocks – multi-scale experiments and modelling

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Objective:

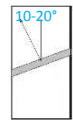
- Understand the basic mechanisms that affect the origin of localized compaction zones at the grain-scale
- Analyze how grain scale, cement content and stress path affect this onset
- Characterization of compaction bands in natural and synthetic rock examples

Context:

- Compaction bands are narrow **planar** zones, form **perpendicular** to the most **compressive** principal stress.
 - ❖ Affect the hydro-mechanical properties of the formation
- Compaction bands in **highly porous** hydrocarbon reservoirs **affect** the attempts to **inject or extract fluids** for energy storage or production.



Shear band



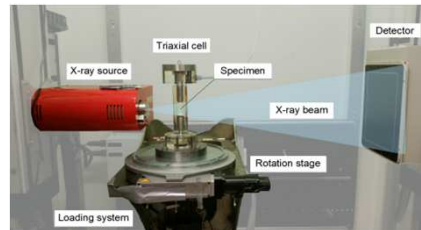
Compactive Shear band



Compaction band

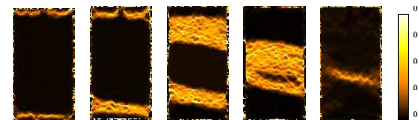
Tools:

- X-Ray tomography



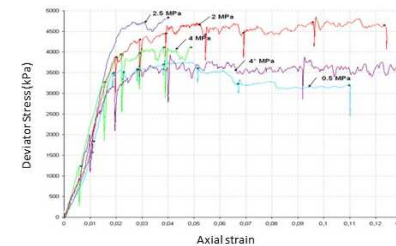
- Digital Image Correlation (DIC)

Maximum Shear Strain



Experimental Approach:

- Triaxial compression



- Isotropic compression

