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Porosity distribution in a heterogeneous clay-rich fault core

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Fault zones influence the mechanical properties and seismological behaviour of the Earth's crust and also the migration and trapping of sub-surface fluids. In addition to natural processes, their behaviour has broad implications to issues such as oil and gas production, the sequestration of carbon dioxide and the geological disposal of radioactive wastes.

Recent investigations carried out at the Tournemire Underground Laboratory (URL), run by the French Institute for Radiological Protection and Nuclear Safety (IRSN) have highlighted heterogeneous fault gouge strengthening processes within a small-scale vertical strike slip fault affecting a low-permeability shale.

The aim of this project is to determine precisely, in an apparently heterogeneous and poorly consolidated brecciated rock, the porosity variations in and around the different fault gouges and define their relationship to chemical and/or mechano-chemical processes.

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