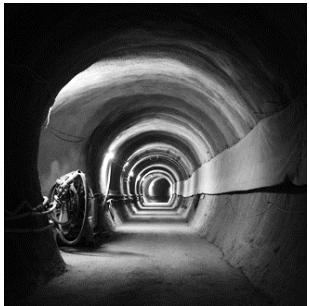
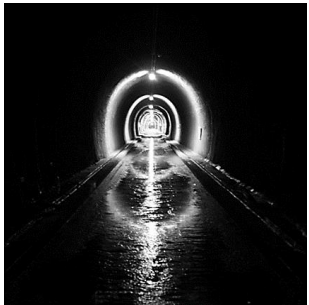
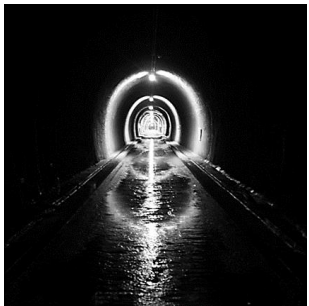


# Tiltmeter Measurements at the Underground Rock Laboratory in Mont Terri

Dorothee Rebscher + Mont Terri Project Team

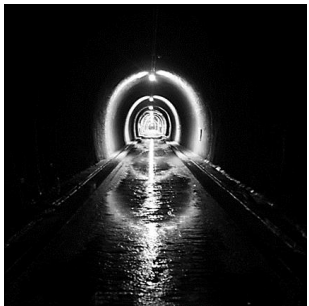
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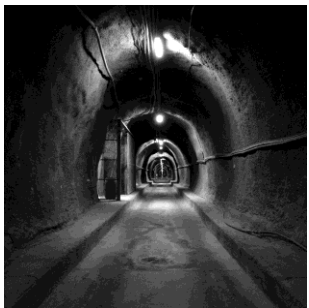
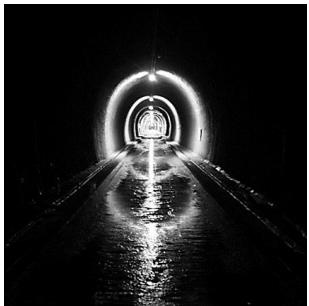


Mont Terri rock laboratory (Swiss Jurassic Mountains), focus on the investigation and analysis of the **properties of argillaceous formations**. The scope of **Opalinus Clay** as a safe, potential option for **nuclear waste disposal** was broadened, as the behaviour of claystone is of high interest also in the context of **caprocks**, and hence, for many dynamical processes in the subsurfaces. Extensive research has been performed already for more than 20 years by the **partners of the Mont Terri Consortium**.





The Mont Terri partners cover a broad range of scientific aspects using **numerical modelling, laboratory studies, and last not least in-situ experiments.** Here, included in the long-term monitoring programme, new investigations apply **tiltmeters.** Since April 2019, biaxial platform tilmeters have been installed at various locations within the **galleries and niches of Mont Terri.** The tilt measurements are **embedded within various experiments** contributing to specific, multiparametrical studies.



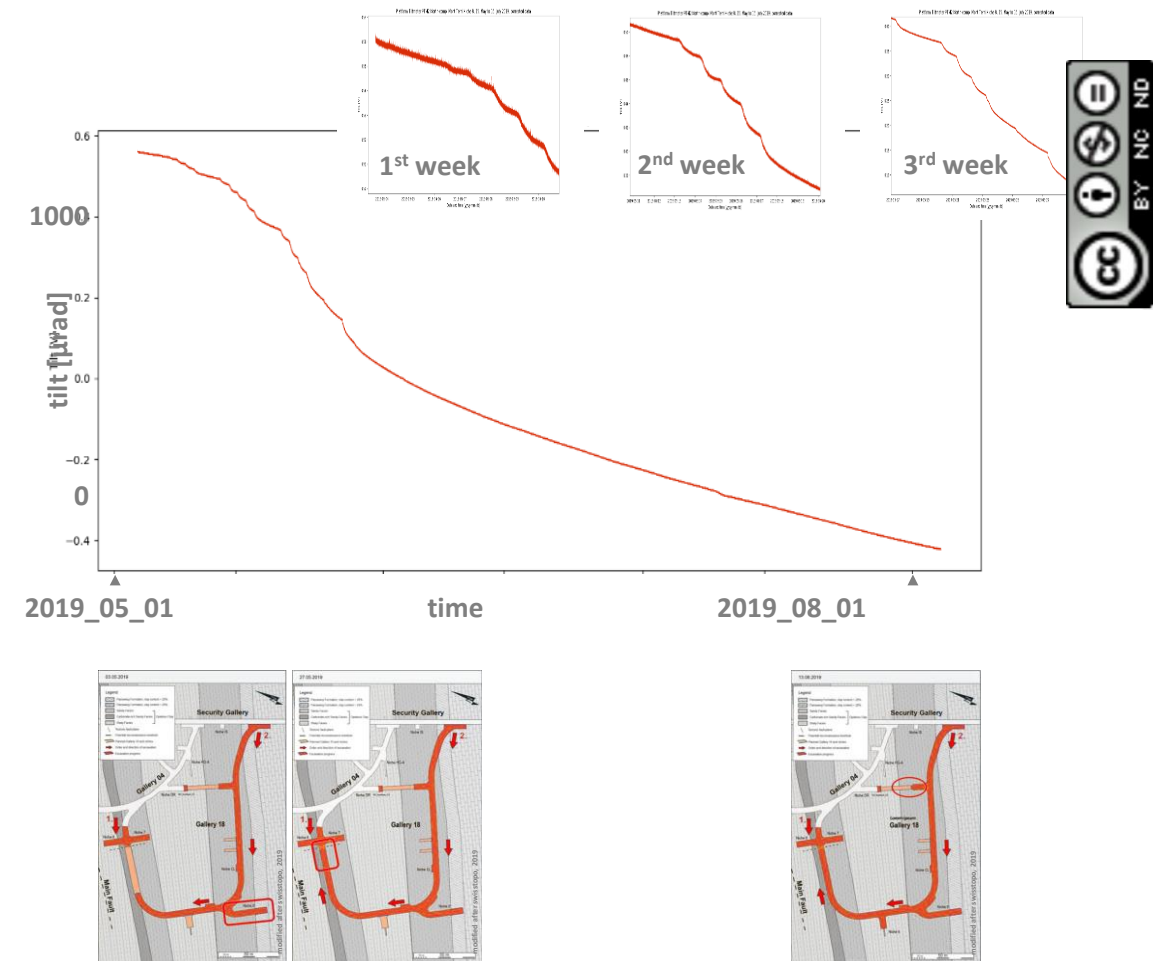
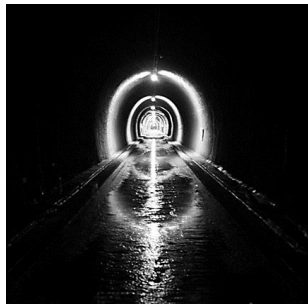
The **growing tilt network** as a whole will also provide novel information of the rock laboratory. The different time-scales of interest include **long-term observations of yearly and decadal variability**. Several instruments are embedded in various **multicomponent experiments**. So far tilt signals were identified due to **excavations** during the recent enlargement of the laboratory, **earthquake activities**, and **local effects**.

# tilt signal

# due to excavation of a new gallery

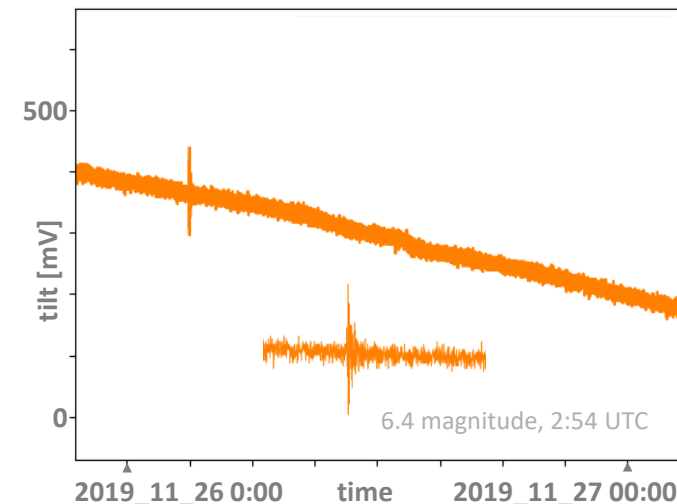
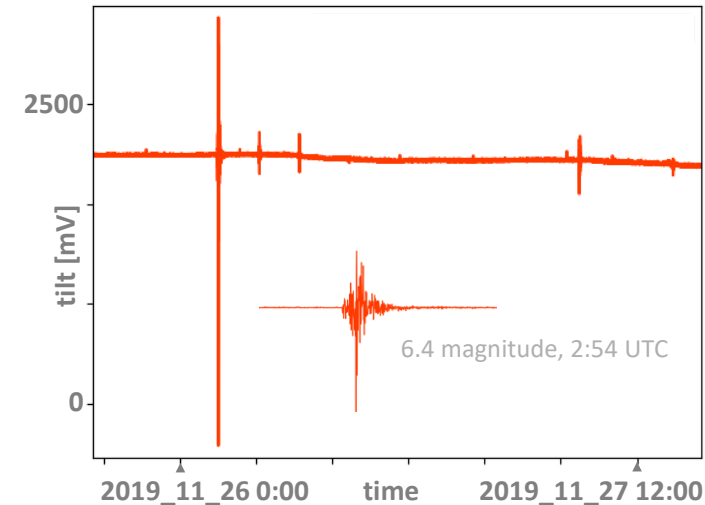
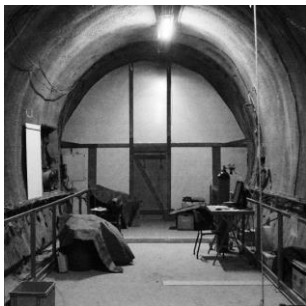
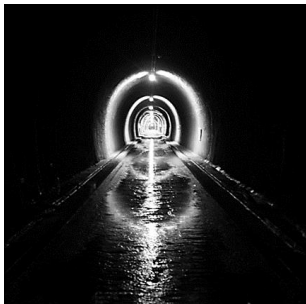
distance dependent  
response of a new  
platform tiltmeter in  
regard to progress of  
excavation in 2019,

orange coloured gallery  
tunnel shows progress of  
excavation



main event and aftershocks of Albania earthquake starting on November 26<sup>th</sup>, 2019; distance to Mont Terri rock laboratory about 1100 km

detected with several instruments, in different spatial components, and at different locations





- **successful test of tiltmeters as a new method in an underground rock laboratory for radioactive waste disposal**
- **so far, signals could already be detected due to excavation activity during the enlargement of the underground rock laboratory, due to earthquake activity and local effects**
- **aim 1: deformation observations in the Mont Terri rock laboratory are embedded in various experiments**
- **aim 2: monitoring of natural long-term and short-term deformation signals in the Mont Terri rock laboratory**

