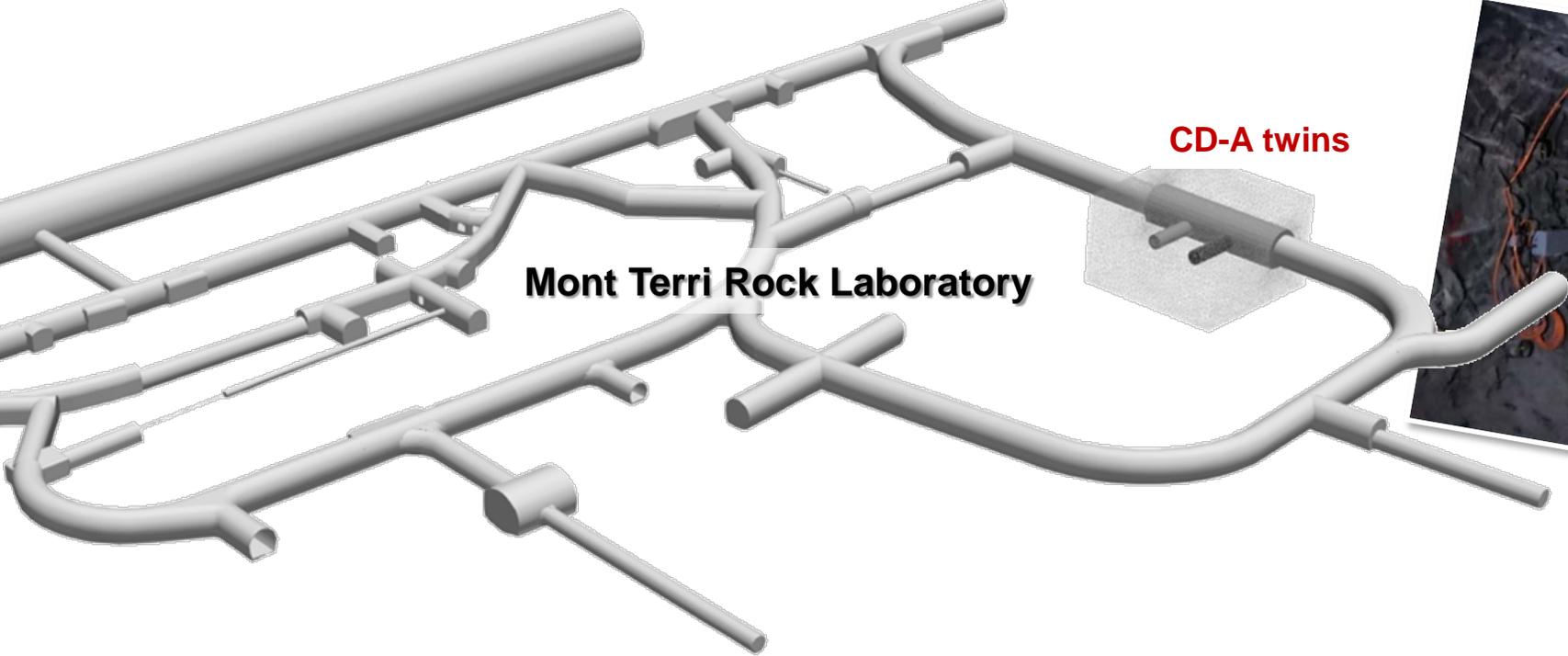


In-situ Experiment on the Influence of Humidity on the Cyclic and Long-Term Deformation Behavior (CD-A) of the Opalinus Clay at the Mont Terri Rock Laboratory, Switzerland: Excavation of the Twin Niches, First Measurements, Simulations and Analysis

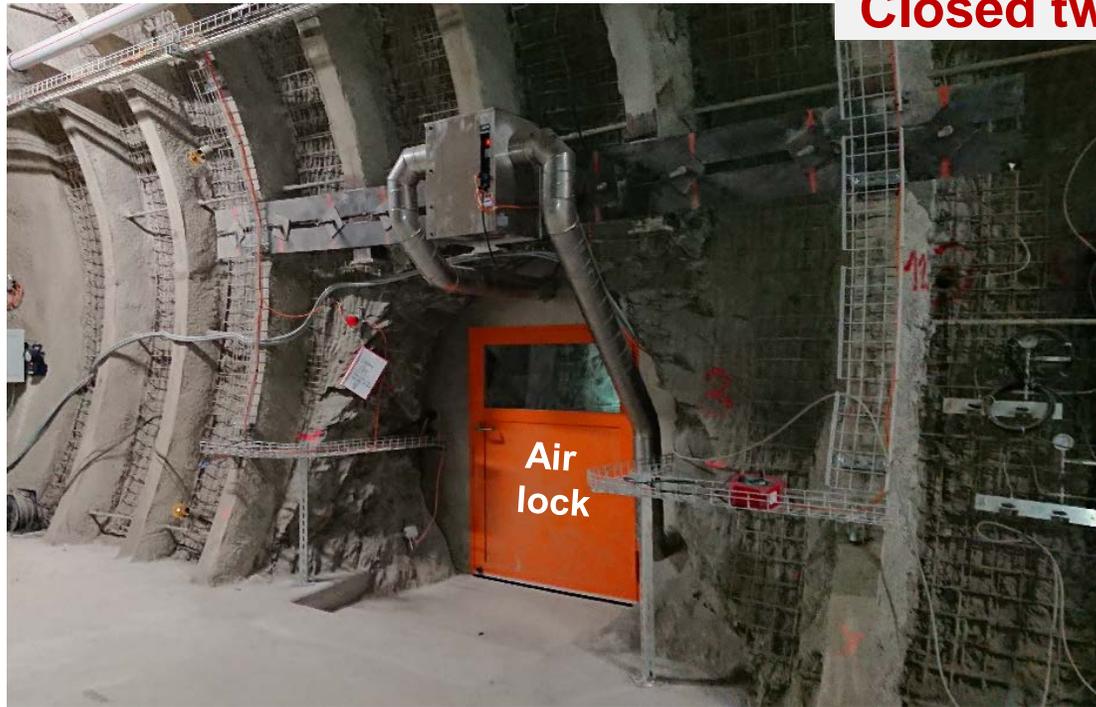
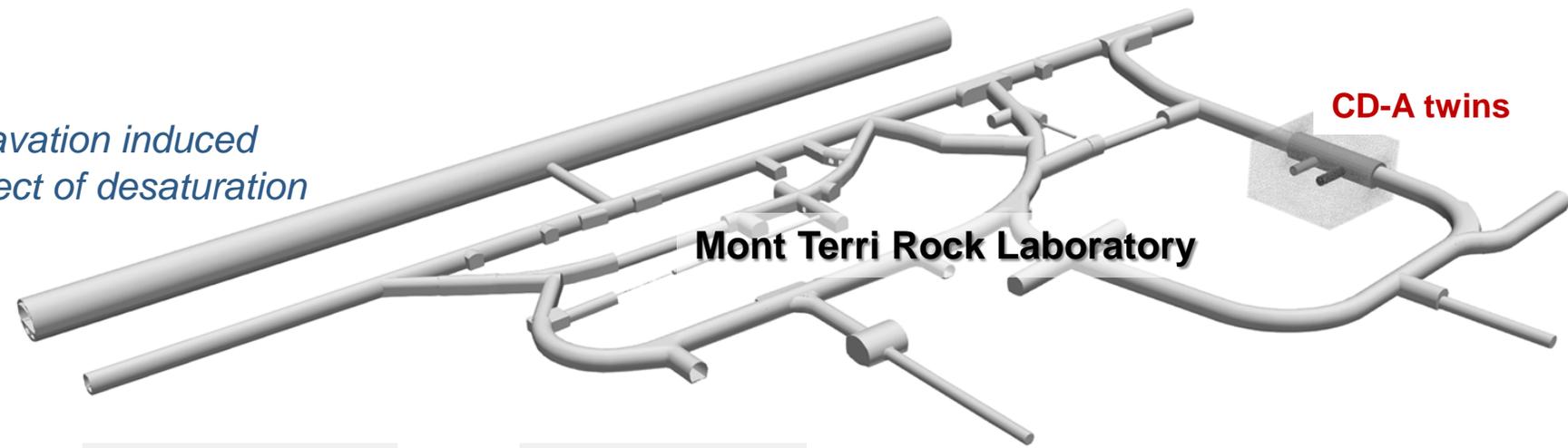


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 Stephan Costabel^{*1}, Markus Furche^{*1},
 Bastian Graupner^{*2}, Jürgen Hesser^{*1},
 David Jaeggi^{*3}, Franz Königer^{*4},
 Jobst Maßmann^{*1}, Karsten Rink^{*5},
 Rainer Schuhmann^{*4}, Bernhard
 Vowinckel^{*1}, Klaus Wiczorek^{*6}*

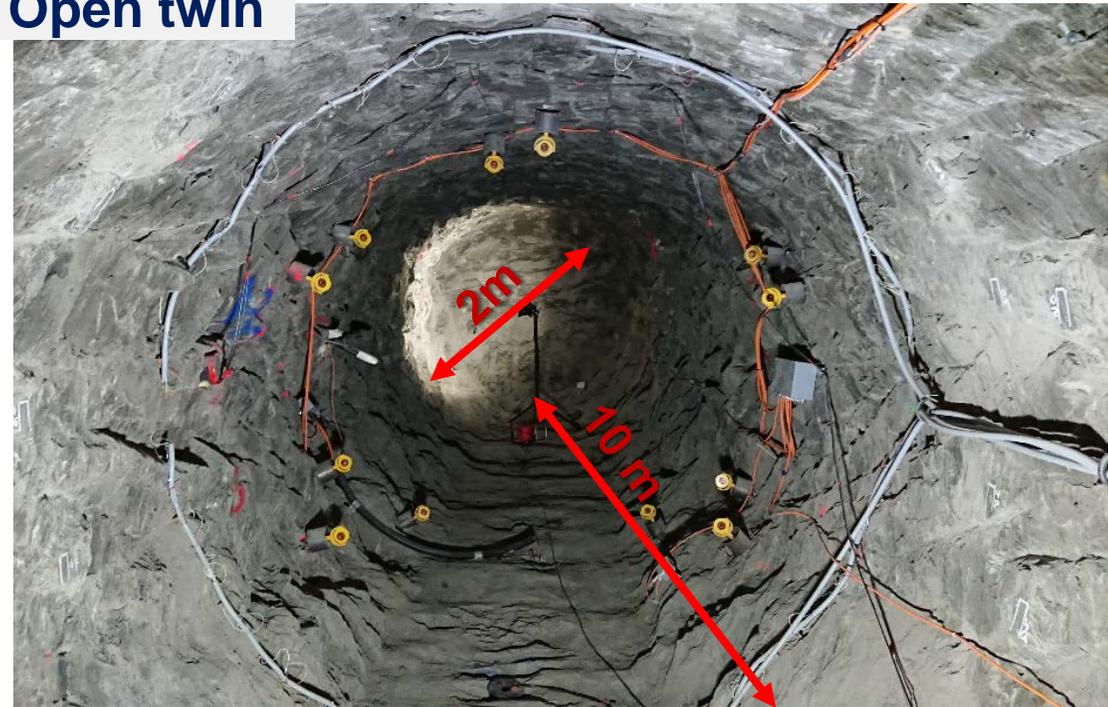


CD-A Experiment

*Aim: Increased understanding of the excavation induced
Mechanical processes by avoiding the effect of desaturation*

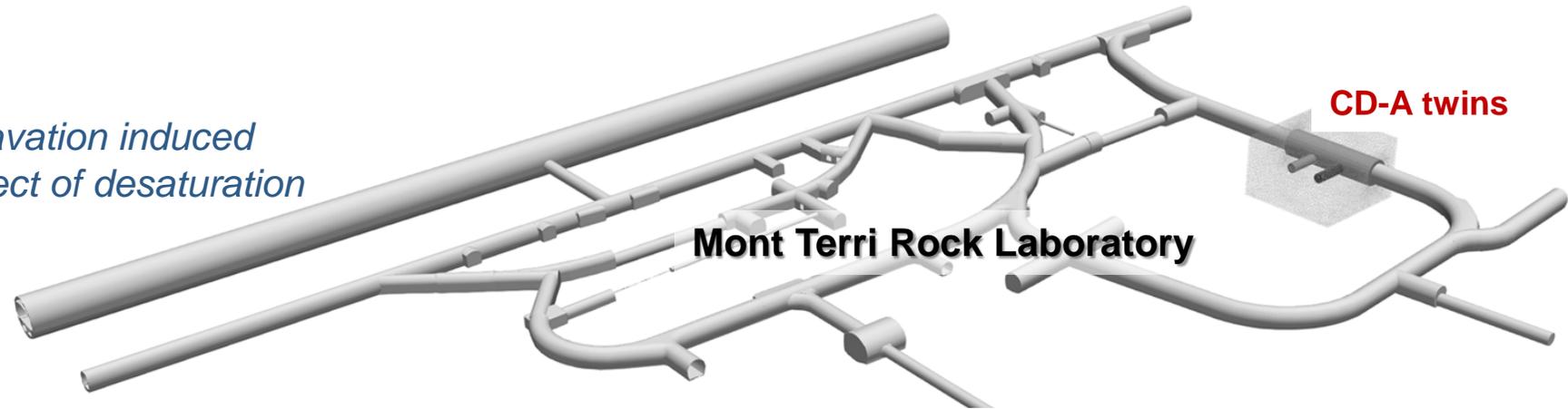


Open twin

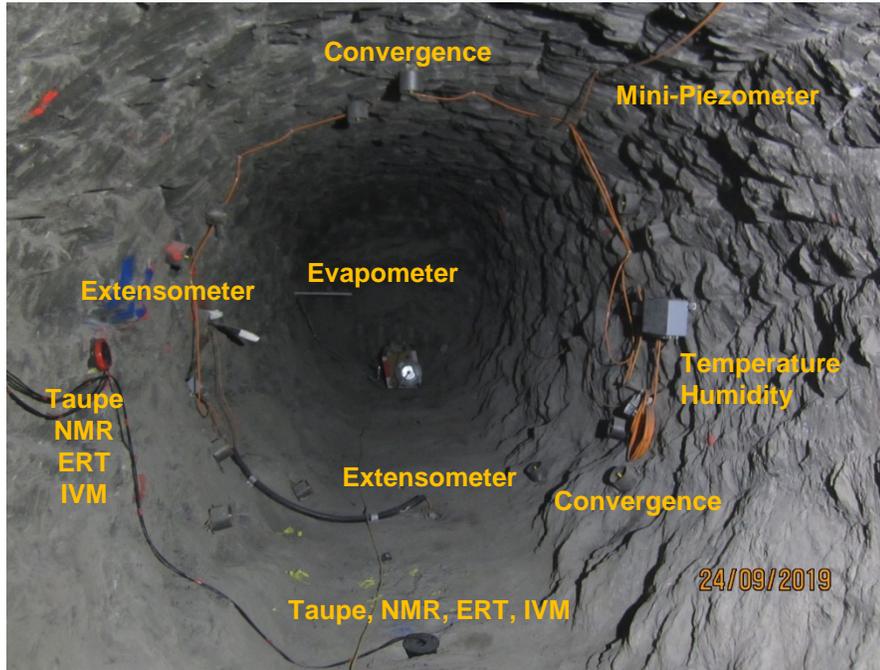


CD-A Experiment

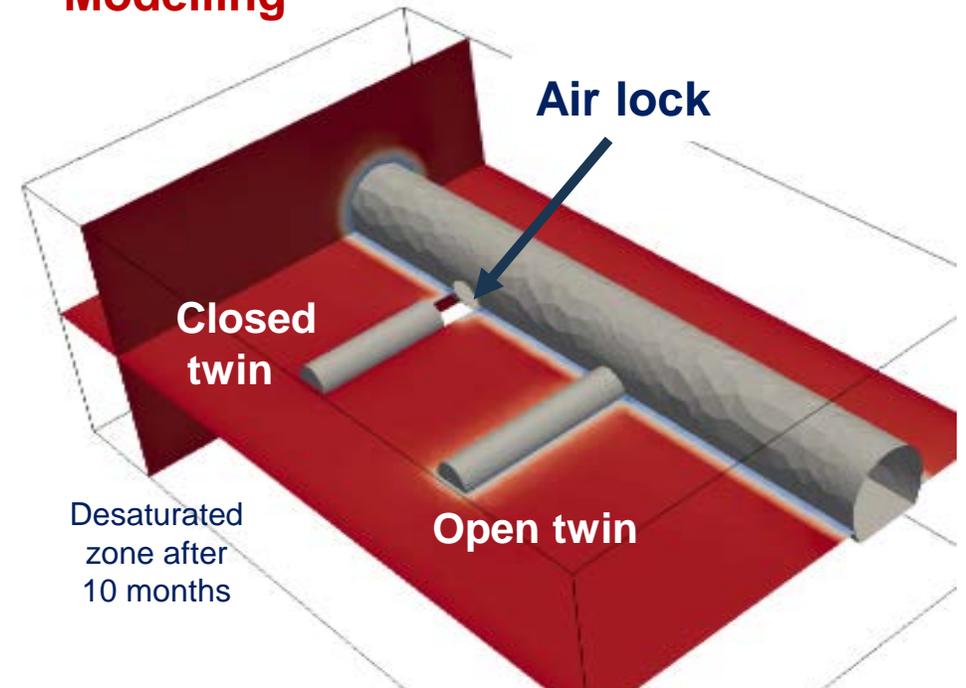
Aim: Increased understanding of the excavation induced Mechanical processes by avoiding the effect of desaturation



Measuring campaign

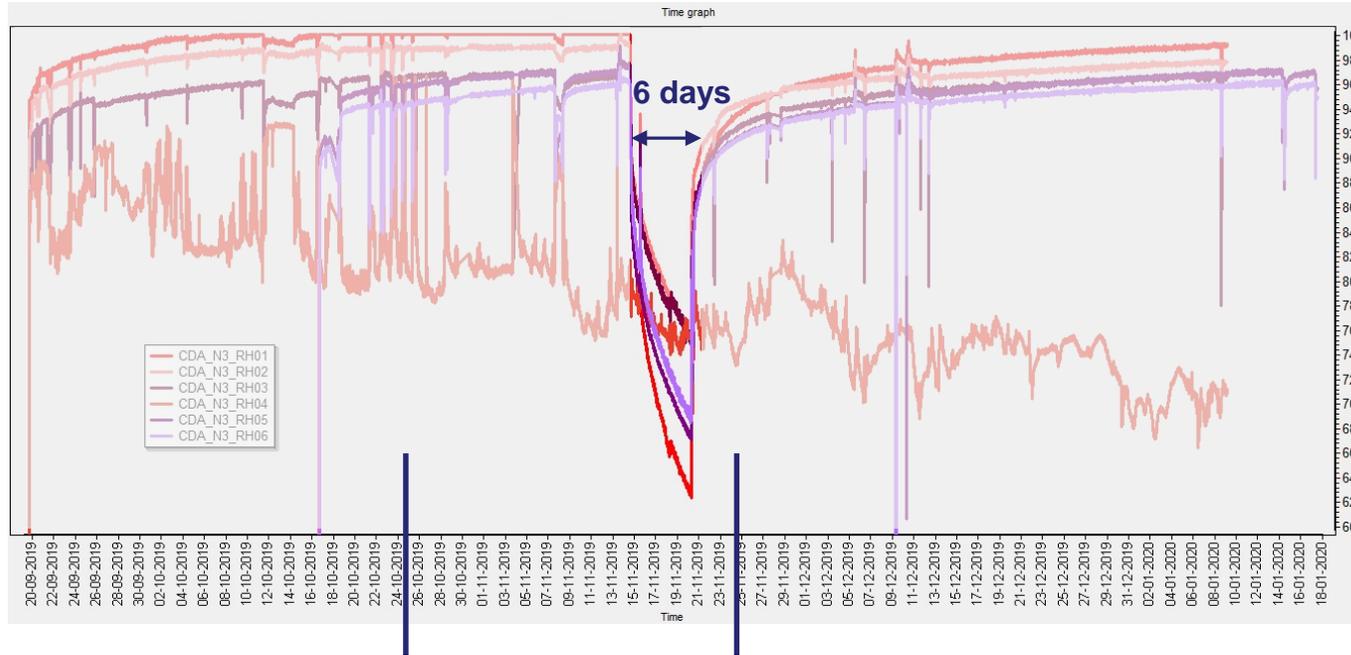


Modelling

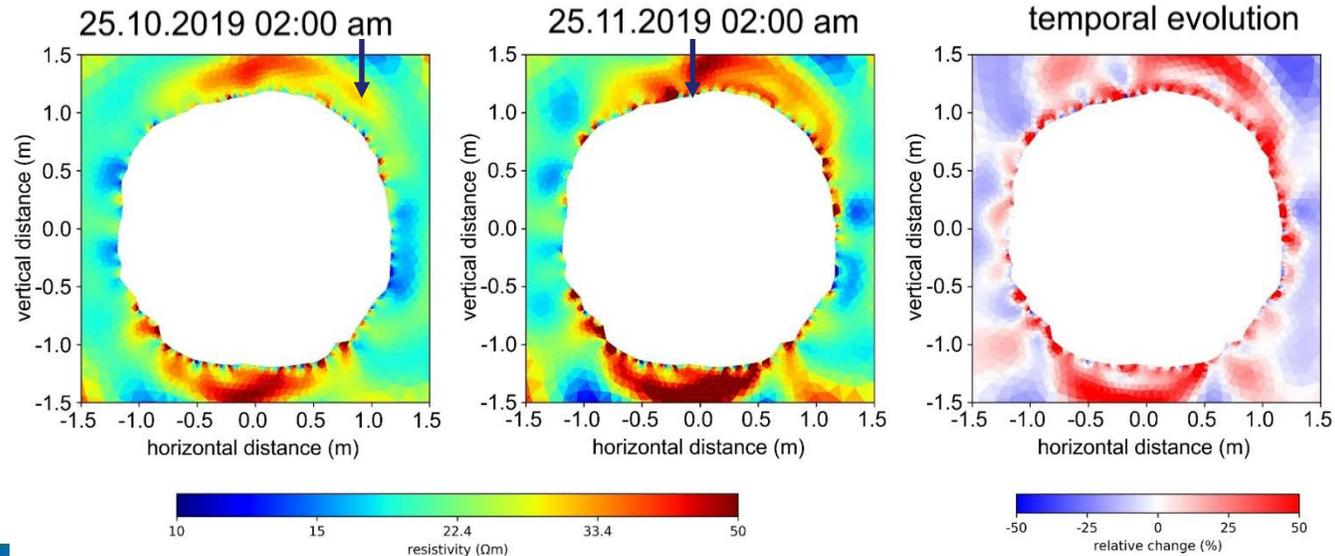


Example: First results

relative humidity



ERT



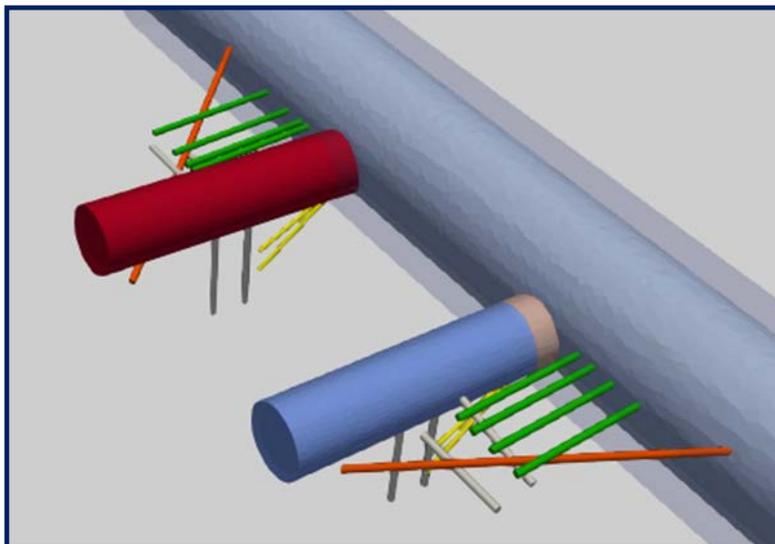
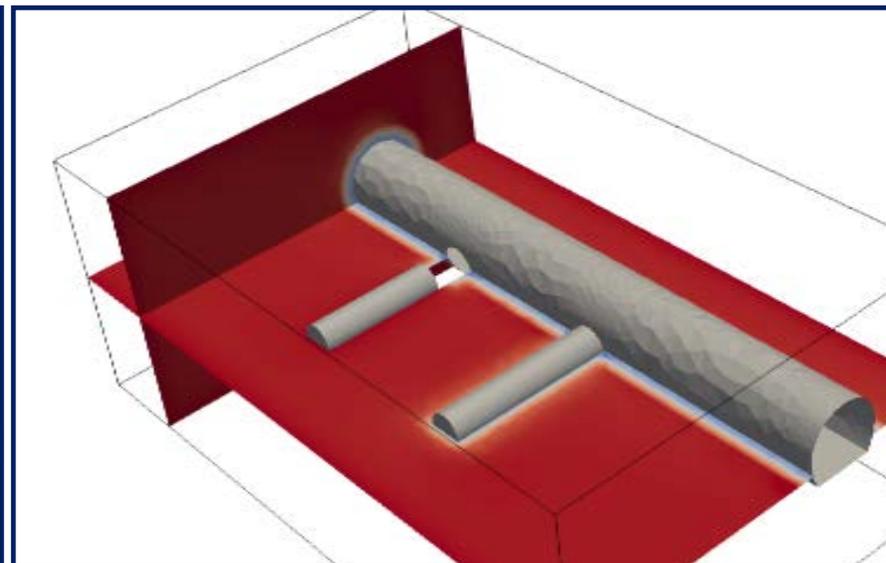
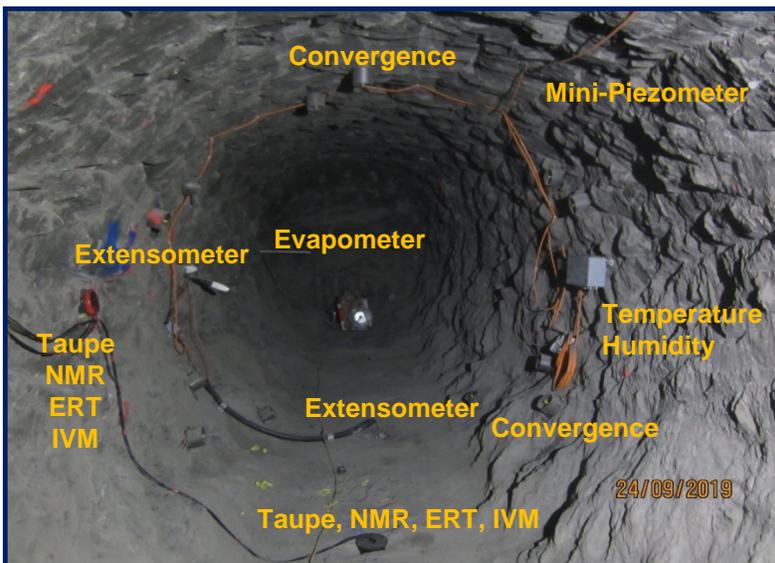
6 days of open air lock . . .

- decreases the rel humidity
- affects the ERT results
- rel humidity increases quickly, when niche is closed again

System reacts quite fast!

CD-A Experiment: first results

Influence of humidity on cyclic and longterm deformations



- *Measurements indicate significant differences between open and closed niche (ERT, NMR, Taupe)*
- *Closed niche: Decrease of relative humidity (climatisation, open door) affects host rock significantly (ERT, NMR)*
- *Influence of gallery stabilization (Mini-Piezometer)*

Thank you!



24/09/2019