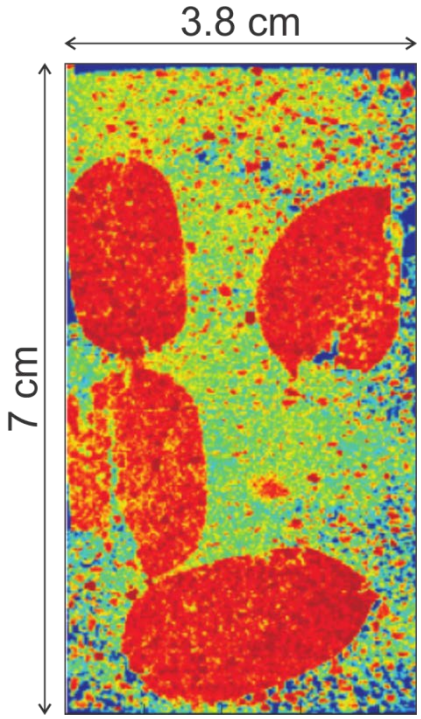
NUMERICAL MODELLING THE HYDROMECHANICAL BEHAVIOUR OF BENTONITE UNDER IN SITU CONDITIONS



Gens et al. (2011)

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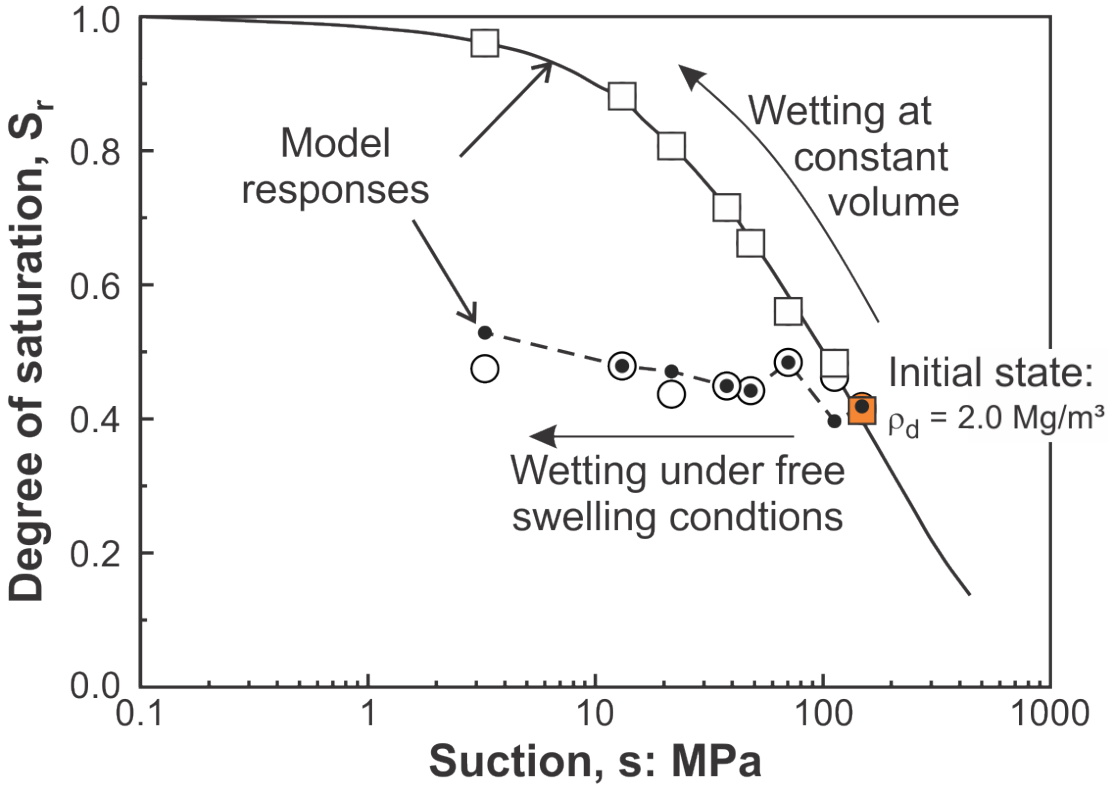
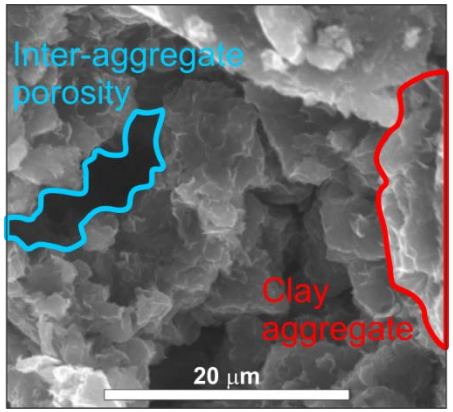
University of Liege (Belgium)

Université de Liège

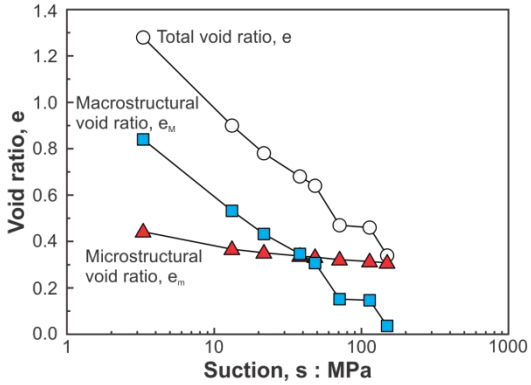
Hydraulic aspects – water retention

- Double-porosity structure $e_w = S_r \,.\, e = e_{wm} + e_{wM}$





(Lloret et al. 2003)

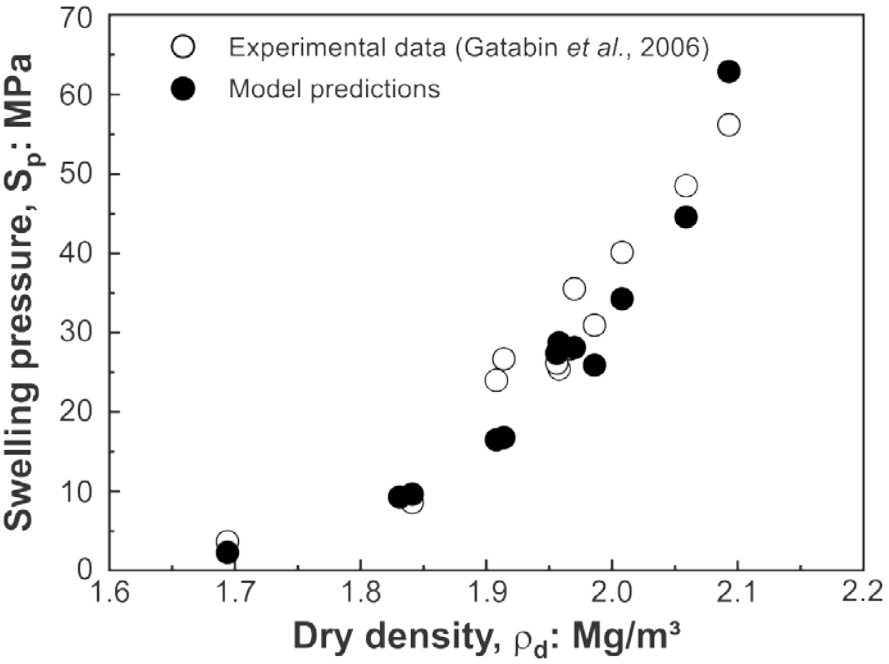


Experimental data: **70% MX-80 bentonite – 30% sand** - Gatabin et al. (2006)

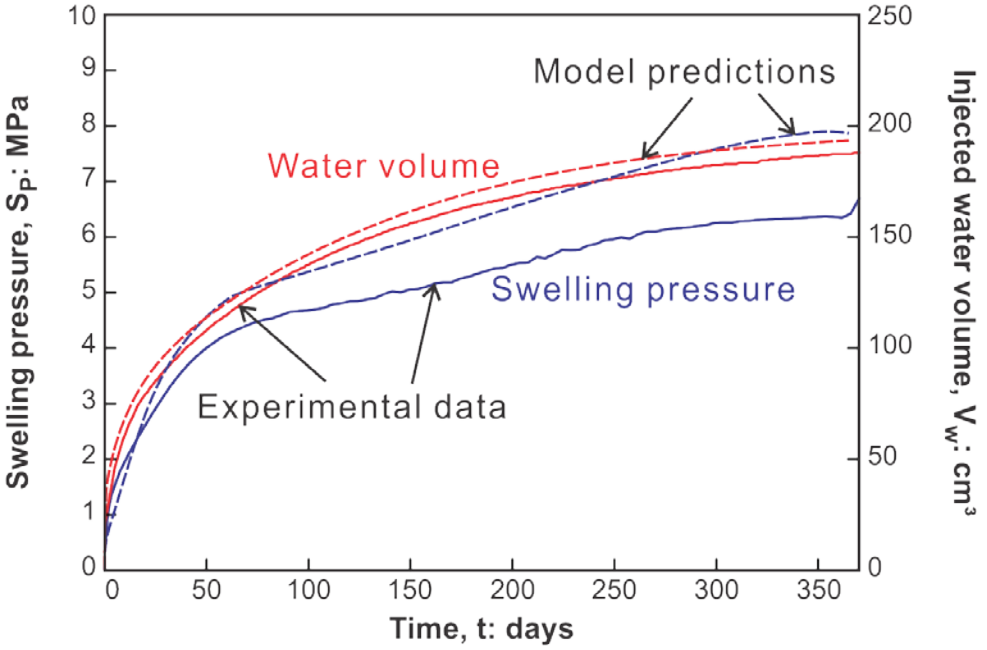
Mechanical aspects

- Elastoplastic model for partially saturated soils = “Extended” BBM

Swelling pressure tests



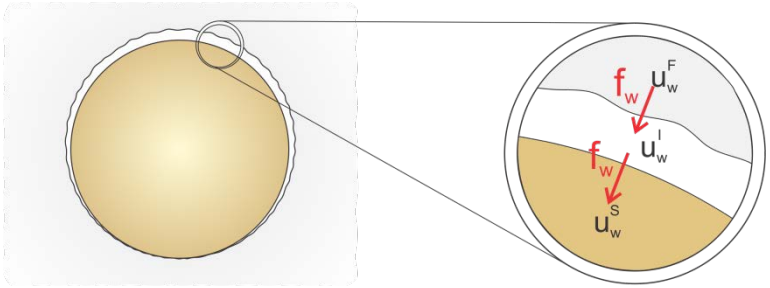
Infiltration test (BENTOGAZ2)



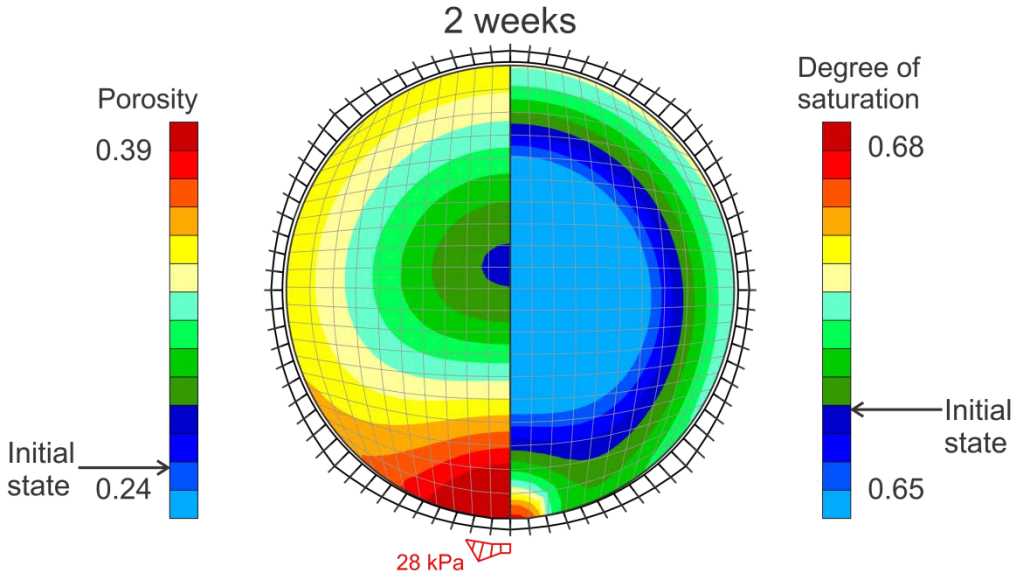
Experimental data: **70% MX-80 bentonite – 30% sand** - Gatabin et al.

Technological gaps and interfaces

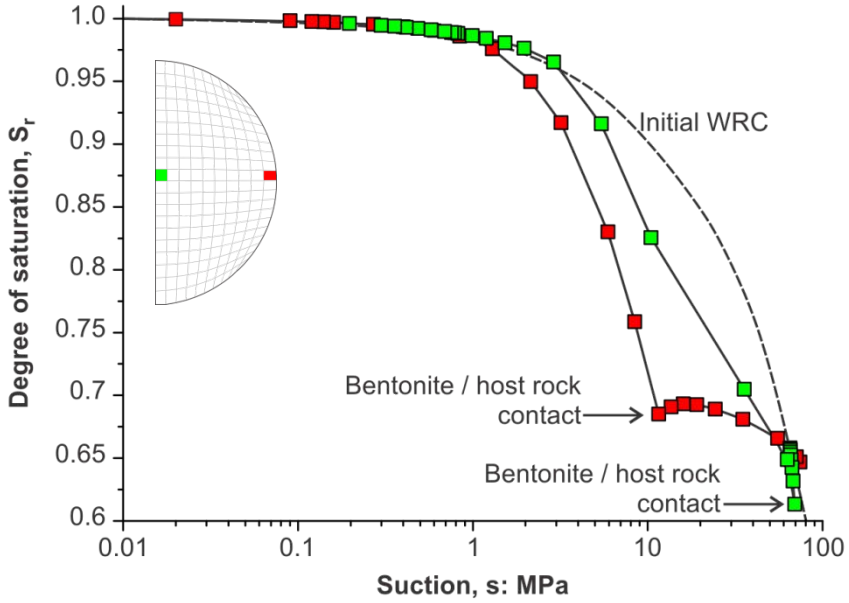
- Coupled finite element interface



PGZ2 in situ test (Andra): 2D model



Borehole diameter = 101.3 mm Initial buffer diameter = 94 mm
Initial technological void = 13%



Proposal

Numerical modelling of laboratory and large-scale in situ tests of bentonite buffers with pellets – powder mixture

- Joint work with experimentalists for the development of laboratory tests
- Hydro-mechanical model: existing double-porosity framework – Extend the model to better account for the microstructure evolution and the effects of initial dry state

- Available resource : FE code FE code LAGAMINE (large deformations)
- Resources rcher's salary + c cost