

Quantification of heat transport and heat recovery for a High-Temperature Aquifer Thermal Energy Storage field experiment

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Aquifer

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ATES (Aquifer Thermal Energy Storage)

- Can be useful for heating and cooling
- Are already in use at low temperatures

High-Temperature- ATES (HT-ATES)

- May provide directly higher required temperature levels
- May achieve higher heat rates and storage capacities

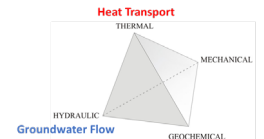
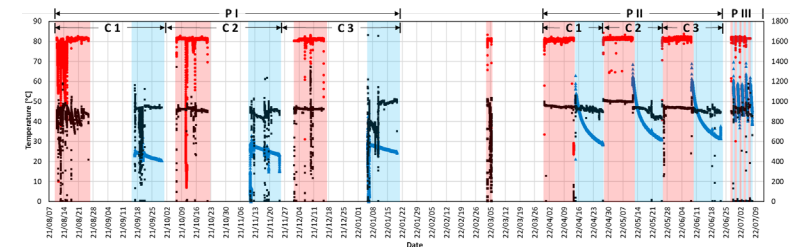
Aims of this work:

- Verification of governing processes and their parameterization
- Prognosis of energetic performance and induced subsurface temperatures during storage operation

Method:

- Numerical process-based simulation of a dedicated field experiment

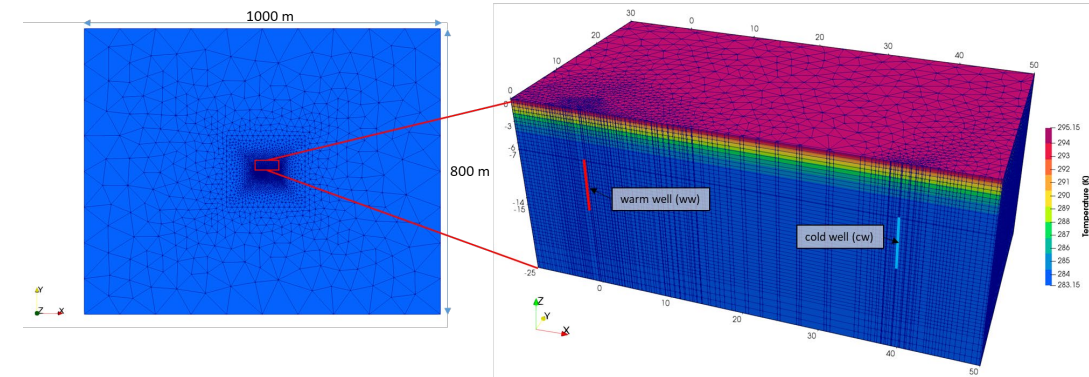
Test set-up



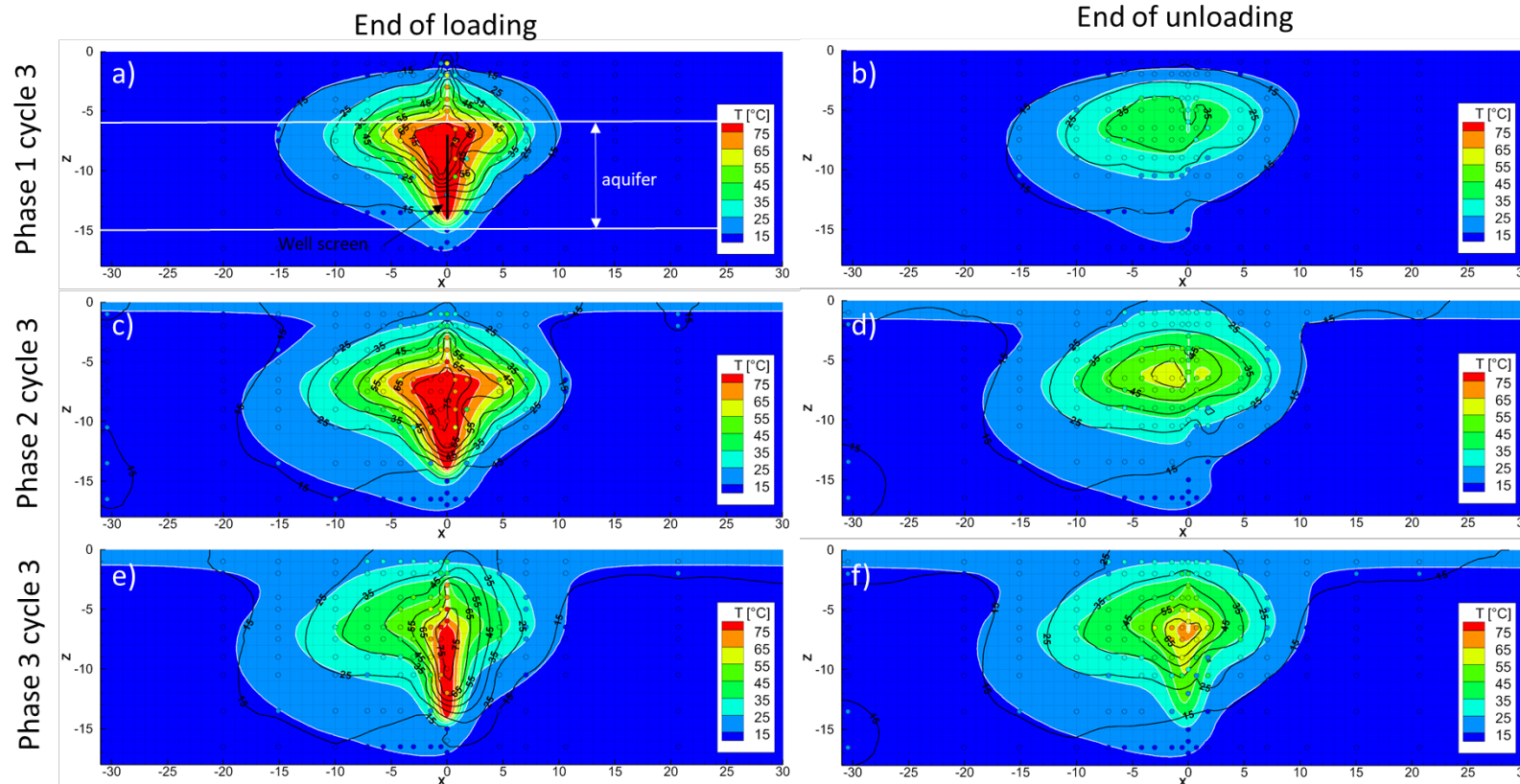
OpenGeoSys

Thermo-Hydro-Mechanical-Chemical (THMC) code **OpenGeoSys**

Numerical model



Comparison of simulated and measured temperature distributions



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Generally good agreement of model results and measured data

- Verification of model approach
- Suitable method for HT-ATES dimensioning and assessment