Karlsruhe Institute of Technology

Institute: Applied Geosciences (AGW)
Geothermal Energy and Reservoir Technology

Optimised multicomponent geothermometer MulT_predict

12th European Geothermal PhD Days – February 2021 – France

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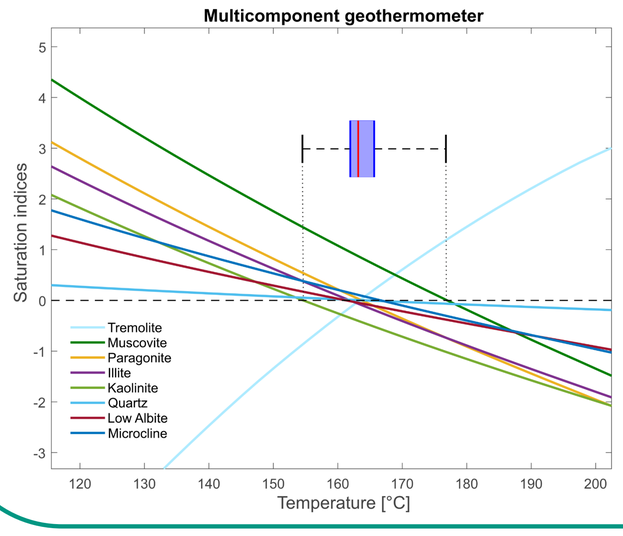
1. Method

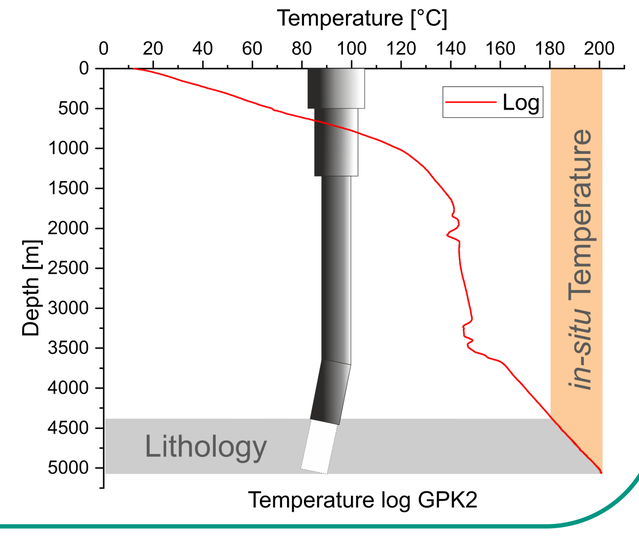
Reservoir temperature estimation from a standard chemical water analysis without gas analysis



Assuming a chemical equilibrium between reservoir rock and hot water

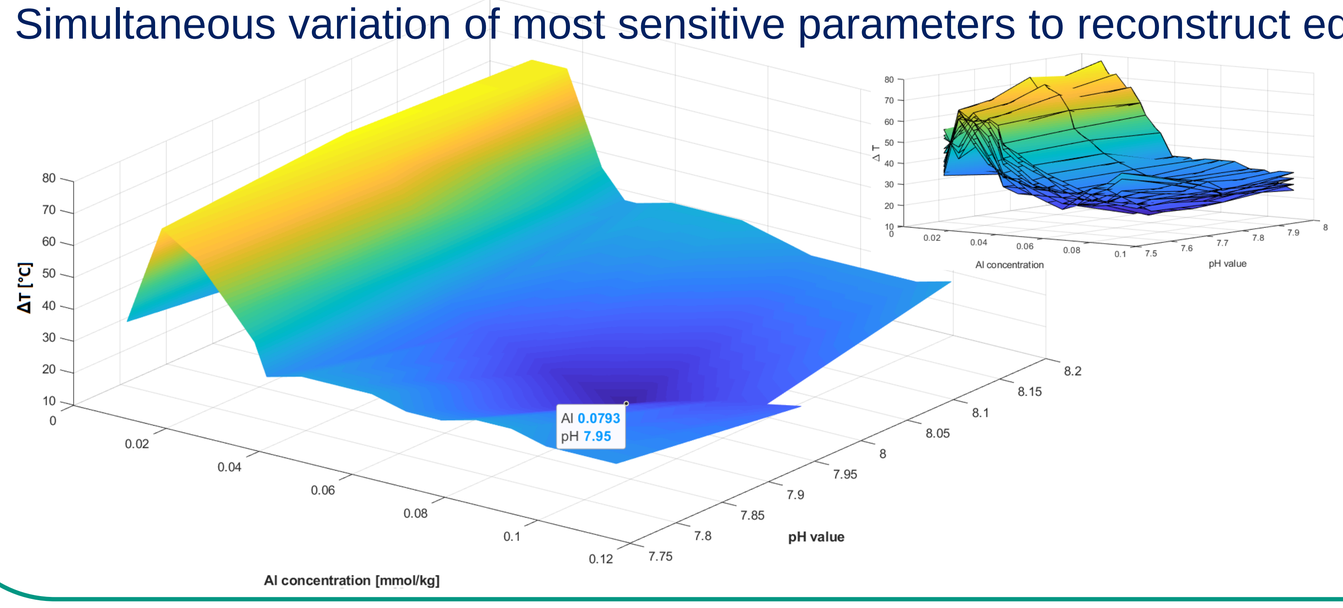
Using the saturated state of reservoir minerals (SI = 0) for temperature estimation (indicated by box plot) [left figure]

Validating the method by comparing to temperature logs or wellhead data [right figure]



2. Optimisation

Simultaneous variation of most sensitive parameters to reconstruct equilibrium reservoir conditions

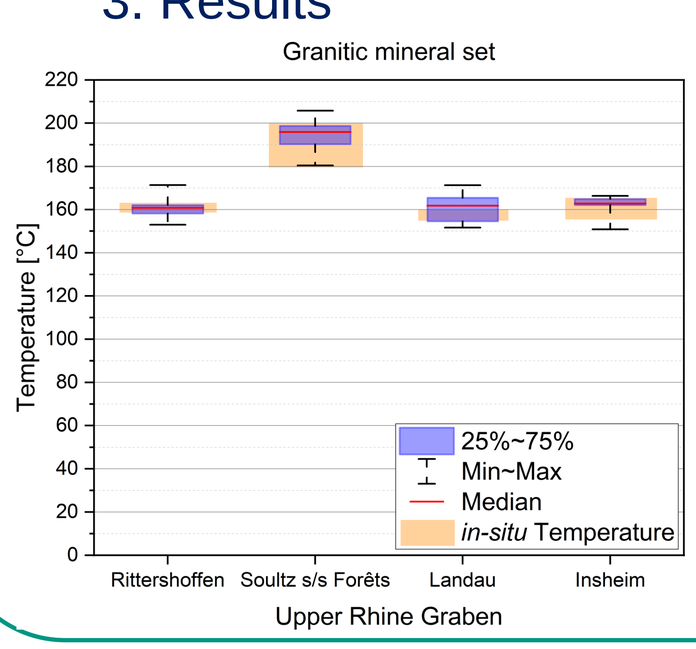


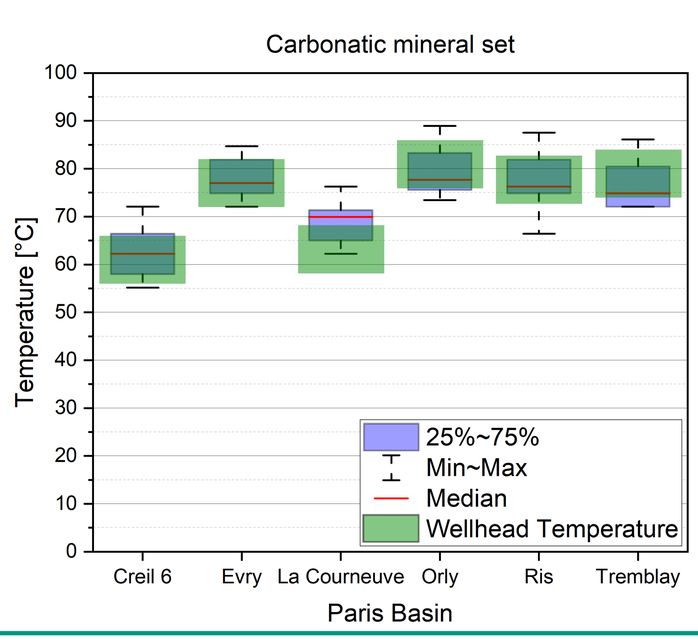
Multidimensional optimisation of several parameters [left figure]:

- Aluminium concentration (x-axis)
- pH value (y-axis)
- Steam loss or dilution (stacked layers)

Assuming the best temperature estimation, when saturation temperatures converge in a global minimum (z-axis)

3. Results





Temperature estimations fitting the *in-situ* temperatures or wellhead temperatures [left figures]

MulT_predict is an optimised reservoir temperature exploration tool:

- Precise
- Economical
- Easy-to-handle

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