

ROCK MECHANICAL AND HYDROGEOLOGICAL CHARACTERISATION AT THE BEDRETTO TEST SITE

Context and objectives

Part of the effort to enable the utilization of deep geothermal energy in Switzerland, fundamental research is being performed in underground laboratories to study the hydro-mechanical processes prevailing during reservoir permeability enhancement operations. This research is primarily made in the framework of a Swiss Competence Center called SCCER-SoE (www.sccer-soe.ch). In the next phase of the activities of the SCCER-SoE, a new underground laboratory will be setup in the Bedretto tunnel. This new laboratory will allow developing experiments in conditions and at scales that get closer to the actual scale and conditions of a deep geothermal project.

When setting up a new test site, it is required to characterize in details the conditions at and around the site. This includes geological, geomechanical, hydrogeological and geophysical investigation at the site in order to build a comprehensive model of the initial conditions prior designing and executing an in-situ experiment. This characterization exercise of the new Bedretto test site will be initiated in summer 2017.

Research approach and methodology

The role of the Msc student will be to contribute to this test site characterization. Depending on the interest of the student and the development of the project a wide range of method could utilized including amongst other:

- Geological mapping and rock mass characterization
- Fracturing analyses using photogrammetric and laser scanning methods
- Hydrological study by inflow monitoring
- Rock mechanical characterization through laboratory tests
- Stress measurements
- Fracture network modeling

All this information will be integrated in a model capturing the initial site conditions.

Partners and collaboration

The project will be supervised by Prof. B. Valley and Dr. Florian Amann (ETH Zürich). During this project the student will get the opportunity to interact with the SCCER-SoE research community and particularly the DugLAB Team (the people from the SCCER-SoE that specifically works on underground laboratory experiments).

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