Title of the project: Modeling CO_2 injection into a geological reservoir

Context

By 2025, the EPFL Carbon Team's prototypes will be up and running, capturing the first kilos of CO_2 directly from the atmosphere, as well as from the gas boiler of the animal facility in the SV Faculty. Several solutions are currently being studied for the further processing of this captured CO_2. One of these is permanent storage in specific geological formations in Switzerland. To make this storage as optimal as possible, a number of studies need to be carried out, concerning soil properties, the presence of impurities in the captured CO_2 stream, the conditions under which the carbon dioxide must be present during burial, and the impact of the latter on its environment. To this end, a collaboration with the Laboratory of Soil Mechanics, or LMS, has been developed to enable interested students to work on these topics. This project consists in modeling CO_2 injection into a geological reservoir.

Description

Model the injection of CO_2 into a geological formation and understand the propagation of the injected fluid in time and space. As a result, determine the optimum conditions in which the carbon dioxide should be located.

Requirements

- Knowledge in physics, thermodynamics, mechanical engineering.
- Knowledge in Finite element modeling (FEM).
- Basic Python programming.

Bonus: experience in a lab or with other projects.

Contact

Supervising lab: LMS, Dr. Eleni Stavropoulou.
Student supervisor: Louis Saix (louis.saix@epfl.ch).

Remarks

Project location: Lausanne.
The project can accommodate a maximum of 5 students.

Aimed at ENAC students but students from other sections can also apply to this project.