

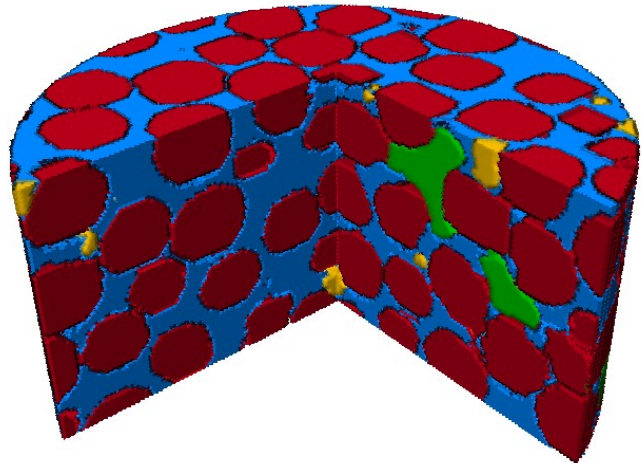
Masters project:

Multiphase flow in porous media

Scientific question:

Our society is addicted to oil; a life without cars, plastic, airplanes ... seems almost unthinkable. Yet more than 50% of the oil in a typical reservoir stays underground because we do not understand very well how the mixture of oil and water flows through a porous medium.

Considering the CO₂ levels in the atmosphere, this might look like a good thing. But if the alternative supplier for our addiction will turn out to be “unconventional” sources, such as tar sands, we have only driven out devils by Beelzebub. Moreover our limited understanding of multiphase flow in porous media also hampers our attempts of CO₂ sequestration.



The experiment:

We will create artificial porous media made from glass beads or sand and then try to replace water or dodecanol (our model oil) with the respectively other fluid. X-ray tomography and additional pressure measurements will be used to characterize the flow dynamics. Then 3D image processing will be the main tool to measure fluid properties such as the capillary pressure and the contact angle.

What you will learn:

Performing X-ray tomography. 3D image processing.

Whom are we looking for:

This project is not for the faint-hearted. You will need a solid background in computer programming (the exact language does not matter) and a good three-dimensional imagination.

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