



Contribution ID: 894

Type: Oral Presentation

Bridging the gap between lab experiments and mixed-dimensional modeling for flow and transport in fractured media

Tuesday 23 May 2023 09:30 (15 minutes)

The existence of fractures in porous media has a strong impact on the characteristics of the flow behavior. In geological rocks, fractures occur both naturally as well as intentionally induced as in geothermal applications. Thus, accurate modeling and simulation of flow and transport in fractured media is vital for many industrial applications.

Mixed-dimensional models have been widely used for modeling flow in fractured media. The high aspect ratio of the fracture width as compared to their remaining dimensions allows for representing them as lower-dimensional manifolds. By combining the fundamental principle of mass conservation and Darcy's law on each subdomain and mass transfer inbetween domains, underlying equidimensional models can be conveniently replaced. Yet, despite the large interest in mixed-dimensional models for flow and transport in fractured media, direct comparisons to high-quality lab experiments have been missing.

In this talk, we present such a comparison study based on PET experiments of tracer transport in fractured sandstone and corresponding numerical simulations of mixed-dimensional flow and transport (PorePy). In addition, we present tailored image analysis (DarSIA) used to transfer PET images to Darcy-scale images and to compare different Darcy scale images by suitable metrics.

Participation

In-Person

References

MDPI Energies Student Poster Award

No, do not submit my presentation for the student posters award.

Country

Norway

Acceptance of the Terms & Conditions

[Click here to agree](#)

Energy Transition Focused Abstracts

Authors: BOTH, Jakub (University of Bergen); BRATTEKÅS, Bergit (Dept. of Physics and Technology, University of Bergen, Norway); FERNO, Martin (University of Bergen); KEILEGAVLEN, Eirik (University of Bergen); NORD-BOTTEN, Jan Martin (University of Bergen)

Presenter: BOTH, Jakub (University of Bergen)

Session Classification: MS03

Track Classification: (MS03) Flow, transport and mechanics in fractured porous media