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MODEL VERIFICATION FOR FLOW IN FRACTURED MEDIA

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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 [1] 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 mass conservation and Darcy's law on each subdomain and mass transfer between domains, underlying equidimensional models can be conveniently replaced.

Despite the large interest in mixed-dimensional models for flow in fractured media, direct comparisons to high quality lab experiments are missing in the literature. In this talk, we compare PET experiments of tracer transport and corresponding numerical simulations for media with single and intersecting fractures. First results indicate a good match, verifying mixed-dimensional models. For the numerical simulations, we utilize PorePy [2], a Python code tailored for simulating multiphysics in fractured media.

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