Intermediate Flowcell Experiments and Invasion Percolation Modeling

Presenter (Theme Affiliation), Research Team

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Objectives of Research

1. to understand and quantify the physics of the transition from compact flow to capillary channel flow at decimeter scale (coupled with core-scale experiments)
2. to develop new experimentally-informed, physics-based models of this transition process, focused on representing cm-scale heterogeneity, with the goal of developing constitutive models suitable for reservoir-scale simulators (tied with ganglion dynamics)

Impact on Specific Challenges

Challenge 2: Capillary channel flow on GCS rates and on other trapping processes to develop a framework for quantifying compactness of a multiphase displacement front

Challenge 3: Controlling CO_2 plumes fingering through a much smaller volume of the storage reservoir by designing chemical amendments

- **from solutes to nanoparticles dispersible in aqueous or bulk CO_2 phases**