

Abstract Submitted  
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**Application of micro-PIV technique to study multiphase flow of water and liquid CO<sub>2</sub> in 2D porous media** F. KAZEMIFAR, G. BLOIS, D.C. KYRITSIS, Univ. of Illinois, K.T. CHRISTENSEN, Univ. of Notre Dame — We study the multiphase flow of water and liquid/supercritical CO<sub>2</sub> in 2D porous micromodels, with the goal of developing a more complete understanding of pore-scale flow dynamics for the scenario of geological sequestration of carbon dioxide. Fluorescent microscopy and the micro-PIV technique are employed to simultaneously visualize both phases and obtain the velocity field in the aqueous phase. This technique provides a powerful tool for studying such flow systems and the results give valuable insight into flow processes at the pore scale. The fluid-fluid interface curvature from the images can be used to estimate the local capillary pressure. The velocity measurements illustrate active and passive flow pathways and circulation regions near the fluid-fluid interfaces induced by shear. Thin water films observed on the solid surfaces confirm the hydrophilic nature of the micromodels. The velocity of the said films is measured by particle tracking.

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