

Abstract Submitted  
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**3d Forced multiphase flow on the pore scale**<sup>1</sup> HAGEN SCHOLL, Experimental Physics, Saarland University, D-66041 Saarbrücken, Germany, KAMALJIT SINGH, Max Planck Institute for Dynamics and Self-Organization, D-37077, Göttingen, Germany, MARIO SCHEEL, MARCO DIMICHIEL, European Synchrotron Radiation Facility, BP 220, F-38043 Grenoble, France, STEPHAN HERMINGHAUS, Max Planck Institute for Dynamics and Self-Organization, D-37077, Göttingen, Germany, RALF SEEMANN, Experimental Physics, Saarland University, D-66041 Saarbrücken, Germany — Using ultra fast x-ray tomography the forced imbibition of an aqueous phase into an initially oil filled matrix is studied. The water is volume controlled flushed into cylindrical columns filled with oil saturated spherical bead packs. The oil displacement is imaged in real time having a spacial resolution of 11 microns and a temporal resolution of about 1 second. To clearly distinguish the aqueous from the oily phase a contrast agent was added to the aqueous phase. The influence of wettability, oil viscosity, gravity and flow velocity was explored and analyzed in terms of temporal development of oil saturation and front shape. It turned out that capillary forces are the key to understand the forced multiphase behavior in the explored parameter range.

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