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# Experimental investigation of the displacement dynamics during biphasic flow in porous media

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We experimentally study the interface dynamics of an immiscible fluid as it displaces a fully saturated porous medium. The system is confined by a vertically oriented Hele-Shaw cell, with piezoelectric type acoustic sensors mounted along the centerline. During drainage potential surface energy is stored at the interface up to a given threshold in pressure, at which an instability occurs as new pores are invaded and the radius of curvature of the interface increases locally, the energy gets released, and part of this energy is detectable as acoustic emission. By detecting pore-scale events emanating from the interface at various points, we look to develop techniques for localizing the displacement front. To assess the quality, optical monitoring is done using a high speed camera.In our study we also aim to gain further insight into the interface dynamics by varying parameters such as the effective gravity, and the invasion speed and using other methods of probing the system such as active tomography. We here present our preliminary results of this study.