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**Two phase flow in a porous Hele-Shaw cell** JOSE LUIS LUVIANO, Universidad de Guanajuato, EDUARDO RAMOS, GUILLERMO HERNANDEZ-CRUZ, Universidad Nacional Autonoma de Mexico, ABEL HERNANDEZ-GUERRERO, Universidad de Guanajuato — We present an experimental study of liquid-air flow inside a 500 x 500 x 1 mm square Hele-Shaw cell saturated with 1mm diameter glass spheres. The flow is characterized by using the light refraction at liquid-gas interface menisci as a marker to determine the time dependent position of the liquid-gas interface. In the flow analyzed, liquid motion is generated by partially filling the cell with water and then letting the water out through an outlet in the lower part of the cell. We have observed that in contrast to what occurs in a Hele-Shaw cell with no spheres where the interface is a horizontal line that moves downwards, for a Hele-Shaw cell filled with spheres, the liquid-gas interface is an irregular line that moves with localized sudden motions generated by surface tension effects occurring due the non-regular geometry of the sphere arrangements. The distance scale of these dynamic structures is approximately ten sphere diameters. These observations are potentially useful in the underground water flows and petroleum extraction.

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