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Electrically driven flow of viscous liquids in a radial Hele-Shaw geometry[1] MARIO LOPEZ[2], THOMAS WARD[3], University of California - Los Angeles — Viscous fluid flow control in confined geometries (at dimensions less than the capillary length, ranging from 500 to 100 μm) such as in porous media are of interest to emerging fields, such as micro (MEMS) and nano-electromechanical systems (NEMS). When fluids in these devices are driven by pressure, and/or motor driven constant flow-rate pumping then they lack a certain degree of control that is desirable for high precision and robust experiments. Recently, researchers have been studying the possibilities of driving fluid motion in porous media by using electrical phenomenon to overcome some of the shortcomings of there flow-rate and/or pressure driven flow counterparts. Here, a problem involving such a flow is presented to drive the motion of a very viscous non-conducting fluid, such as most common oils, in a Hele-Shaw geometry that is a model for flow in a porous media. The experiments are performed using varying viscosity fluid and the radial area versus time is recorded. The experiments are compared with theory and show good agreement.

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