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Drops in wedges ETIENNE REYSSAT, PMMH, ESPCI — Constrictions or widening of porosity result in non-balanced capillary forces acting at the interface between two fluid phases in porous media. Gradients of confinement can thus be used to produce, break up or manipulate drops and bubbles. We investigate experimentally the motion of oil drops and air bubbles confined between two quasi-horizontal plates forming a sharp wedge. The confinement gradient drives the migration of drops of wetting fluid toward the apex of the wedge. The capillary driving force is balanced by viscous dissipation occurring both in the bulk of the drop and along the contact lines. We provide a minimal model that quantitatively explains the migrations dynamics. In particular, we observe and explain two asymptotic regimes associated to both dissipation modes. We also present various possibilities to trap, expel or transport fluid using confinement gradients.

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