

1116-VB-987

Spencer N. Tofts* (spencertofts@gmail.com) and **Robert Strain**. *On the Existence of Solutions to the Muskat Problem with Surface Tension.*

We consider the Muskat Problem with surface tension in two dimensions over the real line, with H^s initial data and allowing the two fluids to have different densities and viscosities. We take the angle θ between the interface and the horizontal, and derive an evolution equation for it. In the periodic case, Ambrose used energy methods to prove local existence for θ . We extend his methods to the real line, obtaining an energy estimate and proving that a solution θ exists locally and can be continued while $\|\theta\|_s$ remains bounded and the arc chord condition holds. Furthermore, when the viscosity is constant and the initial data is sufficiently small, we show the energy is non-increasing, and that the solution θ exists globally in time. (Received September 15, 2015)