

Well-posedness of the Muskat problem

The Muskat problem is a classical mathematical model which describes the motion of two immiscible and incompressible Newtonian fluids in an homogeneous porous medium. The mathematical model posed in the entire plane can be formulated as an evolution equation for the function that parametrizes the free boundary between the fluids. In this talk, I will present local/global well-posedness results for the 2d/3d Muskat problem in critical spaces. Moreover, I will also discuss a toy model for the 2d Muskat which is globally well-posed for large data in a supercritical space.