

Asymptotics of Hele-Shaw flows injected from multiple points

Michiaki Onodera

Tohoku University, Japan

Abstract

In this paper, we study the asymptotic behavior of Hele-Shaw flows with multiple point sources. Hele-Shaw flows are produced by the injection of incompressible fluid into a narrow gap between two parallel planes. We assume that the fluid initially occupy a bounded domain and more fluid is injected from multiple points in the initial domain at different rates. We prove that, as time tends to infinity, the boundary of the fluid domain approaches the circle centered at the barycenter of the injection points with weights proportional to the injection rates. The distance of the boundary from the barycenter is estimated both from above and below.