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Migration of droplets driven by thermocapillary stress JUAN M. GOMBA, IFAS, UNCPBA, Argentina, GEORGE M. HOMSY, Dept. Math. University of British Columbia. Canada — We study the effect of wettability on the flow of droplets driven by thermocapillary effects. An equation for the thickness profile of the droplet is derived by employing lubrication approximations. The model includes the effect of the contact angle introduced through a disjoining-conjoining pressure term. For complete wetting or low contact angles, the droplet spreads into a long film profile with a capillary ridge near the leading edge, a behaviour that resembles the experiments on Marangoni films reported by Ludviksson & Lightfoot (1971). A self similar solution for the profile of the film and an expression for the non constant velocity of the leading edge are presented. For high contact angles, the droplet moves with a constant velocity as a single entity. Here, the effect of the disjoining pressure is strong enough to keep the droplets almost undistorted from its static shape. This regime is the usual one reported in experiments on thermocapillary migration of droplets. An expression for the velocity is derived. For intermediate values of the contact angle the Marangoni stress and the disjoining-conjoining pressure compete and, accordingly, the behaviour is transient and complex. The occurrence of these three regimes and their dependence on various parameters is analyzed.

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