Well-posedness for a quasi-stationary droplet model

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The moving boundary problem

$$\begin{cases} -\Delta u = \lambda & \text{in } \Omega_t, \text{ for } t > 0\,, \\ u = 0 & \text{on } \partial\Omega_t, \text{ for } t > 0\,, \\ \int_\Omega u\,\mathrm{d}x = V_0 > 0 & \text{for } t > 0\,, \\ V = F(|\nabla u|) & \text{on } \partial\Omega_t, \text{ for } t > 0\,, \\ \Omega_t\big|_{t=0} = \Omega_0\,, \end{cases}$$

for the contact line evolution of a droplet occupying the region $[u > 0]$ is studied. Local existence and uniqueness of classical solutions is established. This is a joint work with Joachim Escher.

References

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