Thermocapillary motion of a droplet on an inclined plate[1]
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spreading on an inclined solid surface in the presence of constant wall thermal gradi-
ents. We use lubrication theory in combination with the Karman-Polhausen integral
method to simplify the governing equations for the droplet motion and energy con-
servation leading to coupled evolution equations for the drop thickness and average
temperature. An important feature of the spreading model developed here is the be-
haviour of the drop at the contact line; this is modeled using a constitutive relation,
which is dependent on the local temperature of the wall. We use a finite-element
formulation to obtain numerical solutions of the evolution equations and carry out
a full parametric study. We investigate the various types of behaviour encountered
due to the interplay of Marangoni stresses, gravity and the dynamics of the contact
line.

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