

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Contact line motion over substrates with spatially non-uniform properties VLADIMIR AJAEV, Southern Methodist University, ELIZAVETA GATAPOVA, OLEG KABOV, Institute of Thermophysics, Russia — We develop mathematical models of moving contact lines over flat solid surfaces with spatial variation of temperature and wetting properties under the conditions when evaporation is significant. The gas phase is assumed to be pure vapor and a lubrication-type framework is employed for describing viscous flow in the liquid. Marangoni stresses at the liquid surface arise as a result of temperature variation in the vapor phase, non-equilibrium effects during evaporation at the interface, and Kelvin effect. The relative importance of these three factors is determined. Variation of wetting properties is modeled through a two-component disjoining pressure, with the main focus on spatially periodic patterns leading to time-periodic variation of the contact line speed.

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Date submitted: 01 Aug 2017

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