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On possible resolutions of the micro-edge problem for a contact line moving on a solid in a pure-vapor atmosphere with no slip and without extended precursor films[1] ALEXEY REDNIKOV, PIERRE COLINET, ULB-TIPs, CP 165/67 — At the previous APS/DFD meeting, we reported on the possibility of a singularity-free description of a moving contact line totally in the framework of classical physics (no disjoining pressure, no slip) thanks to the phase change whose intensity is regulated by Kelvin effect. Pushing this idea further, there remains a related more practical issue: the Kelvin effect, even though classical, becomes apparent at such small scales that the disjoining pressure (DP) may nonetheless play a significant role. Here we show, for a class of DP isotherms remaining finite at zero film thicknesses, that the same kind of natural singularity-resolution mechanism still holds. As before, we consider, in the framework of the lubrication theory and a classical one-sided model, a contact line moving at a constant velocity (advancing or receding) and starting abruptly at a (formally) bare solid surface, the micro- contact angle being either equal to zero or finite. Also touched upon is a possible resolution of the remaining integrable singularities within the paradigm of de Gennes and coworkers, considered here in another talk by the present authors, by means of regularizing the DP isotherm at very small thicknesses.

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