Abstract Submitted
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On integrable singularities and apparent contact angles within a classical paradigm: partial and complete wetting regimes with or without phase change[1] PIERRE COLINET, ALEXEY REDNIKOV, Universite Libre de Bruxelles - TIPs (Transfers, Interfaces and Processes), CP 165/67 — Far from claiming any ultimate resolution of the contact line paradoxes, we argue that a somewhat controversial paradigm, originally employed by de Gennes and collaborators, actually appears both to be quite reasonable at its foundations and to lead to physically consistent final results in a wide variety of situations. Curiously enough, while containing a singularity in itself, the approach nonetheless renders the classical contact-line singularities – both hydrodynamic and thermal – integrable, in particular as far as several quantities of interest are concerned. It is also readily applicable to quite a few situations: from equilibrium shapes and moving contact lines of a non-volatile liquid, to cases with evaporation into either a pure-vapor or an inert-gas atmosphere. The paradigm actually consists in an approach involving both the (positive or negative) spreading coefficient and the disjoining pressure in the form of a positive inverse cubic law, a conceptual framework that most notably describes structures with truncated precursor films on a macroscopically bare solid surface.

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