

Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Static 2D solutions for the profiles of liquids on rigid substrates, including the special case of droplets with finite-length precursor films¹ JUAN GOMBA, CIFICEN (UNCPBA-CICPBA-CONICET), Pinto 399, 7000) Tandil, Argentina , CARLOS A. PERAZZO, (Dept. de Física y Química, U. Favaloro, Buenos Aires, Argentina), J. R. MAC INTYRE, CIFICEN (UNCPBA-CICPBA-CONICET), Pinto 399, 7000) Tandil, Argentina — We present analytical solutions for the shape of static bidimensional profiles of a liquid resting on a substrate under partial-wetting conditions imposed by means of a two-term disjoining-conjoining pressure. In contrast with previous works where we studied the shape of droplets surrounded by infinite precursor films [Gomba, J. M. & Homsy, G. M *Langmuir* 25, 5684 (2009)], [Gomba, J. M. & Perazzo, C. A *Phys. Rev. E* 86, 056310 (2012)], [Mac Intyre, J. R. & Gomba, J. M. & Perazzo, C. A *J. Eng. Math.*, in press (2016)], here we do not impose restrictions on the shape of the profile. We show that for quite general disjoining-conjoining pressure, the free surface can adopt only 5 nontrivial static patterns. In particular we find solutions when the height goes to zero which describe satisfactorily the profile of a finite amount of fluid deposited on a substrate. Interestingly, one of the solutions represents the shape of a droplet surrounded by a finite length precursor film. We make a parametric study and identify the regions where each solution can be found. We compare the solutions with the corresponding ones obtained by more complete models (where the hypothesis of the lubrication approximation is not strictly valid) and with axisymmetric s

¹Conicet PIP 299, PIP 356, ANCyT PICT 1707

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Date submitted: 01 Aug 2016

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