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Contact line pinning of a perfectly wetting and volatile liquid at a sharp edge[1] YANNIS TSOUMPAS, SAM DEHAECK, ALEXEY REDNIKOV, PIERRE COLINET, Universite Libre de Bruxelles - TIPs, CP 165/67 — According to the Gibbs' criterion, a sharp edge can act as an energy barrier during the spreading of a liquid drop on a rigid substrate. In this study, however, we are trying to determine experimentally whether Gibbs' criterion is also valid for the case of a perfectly wetting and volatile liquid. To this purpose, we constructed a groove of triangular cross section on a Plexiglas substrate. During the experiments liquid was injected in the region surrounded by the groove, which had a square shape with rounded corners. The results indicated that a microgroove edge can indeed prevent the spreading of the liquid drop up to a certain extent, with the maximum apparent contact angle being in close agreement with the one given by Gibbs' criterion. Nevertheless, the apparent contact angle at breakup was found to be significantly lower in the corner of our region. To study this further we developed a static model, which takes into account surface tension and gravity but not the evaporation. Both the simulations and the experiments have confirmed a remarkable behaviour of the contact line at the corner. Finally, to grasp the effect of evaporation, experiments have also been conducted with drops of equally wetting but less volatile liquids.

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Pierre Colinet
Universite Libre de Bruxelles - TIPs, CP 165/67

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