

Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Wetting of sessile water drop under an external electrical field VALERIE VANCAUWENBERGHE, Aix-Marseille University, PAOLO DI MARCO, University of Pisa, DAVID BRUTIN, Aix-Marseille University, AMU COLLABORATION, UNIPI COLLABORATION — The enhancement of heat and mass transfer using a static electric field is an interesting process for industrial applications, due to its low energy consumption and potentially high level of evaporation rate enhancement. However, to date, this phenomenon is still not understood in the context of the evaporation of sessile drops. We previously synthesized the state of the art concerning the effect of an electric field on sessile drops with a focus on the change of contact angle and shape and the influence of the evaporation rate [1]. We present here the preliminary results of an new experiment set-up. The novelty of the set-up is the drop injection from the bottom that allows to generate safely the droplet under the electrostatic field. The evaporation at room temperature of water drops having three different volumes has been investigated under an electric field up to 10.5 kV/cm. The time evolutions of the contact angles, volumes and diameters have been analysed. As reported in the literature, the drop elongate along the direction of the electric field. Despite the hysteresis effect of the contact angle, the receding contact angle increases with the strength of the electric field. This is clearly observable for the small drops for which the gravity effect can be neglected.

David Brutin
Aix-Marseille University

Date submitted: 26 Jul 2013

Electronic form version 1.4