

Abstract Submitted
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Asymptotic Behavior of EWOD Force Distribution at a Contact Line ERIC BAIRD, PATRICK YOUNG, KAMRAN MOHSENI, University of Colorado at Boulder — The exact nature of the electrostatic force distribution near the contact line of an EWOD-activated droplet can be expected to play a major role in such phenomena as contact angle hysteresis, contact angle saturation and dielectric breakdown. The electric field very close to a fluid contact line located at the interface of two materials with differing dielectric constants is investigated analytically. This is accomplished via a conformal mapping of the solution domain, as well as series expansions of the electric potential very close to the contact line. The field within each material near the tri-phase boundary is examined and used to discuss the relative importance of such phenomena as charge trapping, corona discharge, local dielectric breakdown and finite fluid resistivity to contact angle saturation.

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