

Abstract Submitted  
for the DFD15 Meeting of  
The American Physical Society

**Partial Coalescence of Liquid Cones with an Electrified Plate**

MADELINE ZHANG, CASEY BARTLETT, JAMES BIRD, Boston University —

As a liquid drop contacts a surface in the presence of an electric field, charge can promote rapid spreading upon contact. In the moments prior to contact, the drop will often develop a conical tip that is qualitatively similar to that seen in droplet pairs undergoing electrocoalescence. Recently it has been shown that in strong electric fields, droplet pairs can contact and then immediately recoil. Yet, it is unclear whether a similar phenomenon exists for droplets that contact charged solid surfaces. Here, we show that droplets can indeed be repelled from dry rigid surfaces, provided that there is sufficient charge. Our high-speed experiments reveal that when an electric field deforms the contacting drop beyond a critical cone angle, the drop will recoil rather than spread. This critical angle is significantly greater than the critical angle previously observed for the identical drop pair coalescence-recoil transition, but is consistent with surface tension-driven dynamics.

Madeline Zhang  
Boston University

Date submitted: 31 Jul 2015

Electronic form version 1.4