Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Splashing of droplets on liquid surfaces MICHAEL CHEMAMA, Harvard University, SHREYAS MANDRE, Brown University, MICHAEL BRENNER, Harvard University — High-velocity impacts of liquid droplets on a solid surface produce a splash. This splash is usually accepted to be the consequence of the ejection of a thin sheet of fluid near the impact point. Recent works have shed light on the formation of this liquid sheet by studying the interaction between the droplet and the thin layer of air above the solid surface just before the impact, both experimentally and theoretically. Here we apply the theoretical approach previously applied to splashing on a solid surface [Mandre and Brenner; JFM, 690, 148 (2012)] to the study of splashing on a liquid surface, where the compressed air layer can now deform two liquid interfaces. We show how the nonlinearities in Navier-Stokes equations lead to the ejection of a thin liquid sheet and how this relates to the experimental observations.

Michael Brenner
Harvard University

Date submitted: 02 Aug 2012 Electronic form version 1.4