MAR12-2011-005603
Abstract for an Invited Paper
for the MAR12 Meeting of
the American Physical Society

## Ultrafast interference of splashing dynamics: where is the air?

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A drop impacting a solid surface with sufficient velocity will splash and emit many small droplets. While liquid and substrate properties obviously are important for determining the splashing threshold, it has also been shown that the surrounding gas is a crucial control parameter [1]. The mechanism underlying how the surrounding gas affects splashing remains unknown. One suggestion [2,3] has been that upon impact the liquid spreads outwards over a thin layer of gas that has been trapped beneath it during impact. In a sufficiently viscous liquid, splashing occurs at the edge of the drop several tenths of a millisecond after impact [4]. This large separation between impact and splashing, in both time and space, creates an ideal system in which to test whether the initial air pocket remains to influence splashing dynamics. We develop high-speed interference imaging to measure the air beneath all regions of a spreading viscous drop [5]. Although an initial air bubble is created on impact, no significant air layer persists up to the time a splash is created. This suggests that splashing in our accessible range of viscosities is not caused by the presence of a layer of air beneath the liquid, but rather it is initiated at the edge of the drop as it encroaches into the surrounding gas.

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