Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Effect of viscosity on dynamics of drop impacting solid surface RAVI SINGH, Brown University, SHREYAS MANDRE, Brown University — High velocity impact between liquid drop and solid surface produces a splash via ejecting a thin sheet of liquid near the impact point. Recent study suggests that the drainage of an intervening air film mediate the origination of this liquid sheet. The nature of this drainage process depends on the viscosity of the drop liquid. Most notably, for vanishing liquid viscosity, the air film drains in a finite time via developing a singularity in finite time where curvature, velocity and pressure diverges near point of contact. On the other hand, in the limit of large liquid viscosity this drainage takes an infinite amount of time. But real liquids have finite viscosity. What is the nature of gas drainage for real liquid drops and how does viscosity affect this drainage? This motivated us to do theoretical and numerical study of the drainage process including both the liquid inertia and viscosity. In particular, we investigate the effect of a finite viscosity on the finite-time singularity that develops near the point of contact.

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Date submitted: 05 Aug 2011 Electronic form version 1.4