Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Viscous Impact MICHELLE DRISCOLL, CACEY STEVENS, SIDNEY NAGEL, University of Chicago — The splashing of both inviscid and viscous drops on smooth, dry surfaces can be completely suppressed by decreasing the pressure of the surrounding gas [1,2,3]. However, at sufficiently high pressure when splashing does occur, the shape and dynamics of the ejected liquid sheets depends strongly on the liquid viscosity. This, as well as the dependence of the threshold pressure on viscosity [2], suggests that the splashing of viscous and inviscid liquids is caused by different mechanisms. When a low-viscosity ($\sim$ 1 cst) liquid splashes, a corona is ejected immediately upon impact. In more viscous fluids (10 cst silicone oil), our experiments show that a thin sheet, resembling a flattened version of the corona seen in the inviscid case, emerges out of a much thicker spreading film. However, for these viscous fluids, the ejection of the thin sheet does not occur immediately. As the ambient pressure is lowered, the sheet ejection time is delayed longer and longer after impact until no sheet is ejected at all. [1] L. Xu, W.W. Zhang, S.R. Nagel, Phys. Rev. Lett. 94, 184505 (2005). [2] L. Xu, Phys. Rev. E 75, 056316 (2007). [3] C. Stevens et al., FC.00003 DFD 2007

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Date submitted: 01 Aug 2008 Electronic form version 1.4