

Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Bouncy Fluid Jets NAVISH WADHWA¹, SUNGHWAN JUNG, Department of Engineering Science and Mechanics, Virginia Tech, PAVLOS VLACHOS, Department of Mechanical Engineering, Virginia Tech — Contrary to intuition, free fluid jets can sometimes “bounce” off each other upon collision, due to an entrained air film that keeps them separated. So far, there have only been a few descriptive studies of bouncing jets, since the first recorded observation by Rayleigh more than a century ago. We present a quantitative investigation of non-coalescence in jets of same fluid upon an oblique collision. Using a simple experimental set-up, we carried out a parametric study of the bouncing jets by varying the jet diameter, velocity, angle of inclination and fluid viscosity. Our results reveal a scaling law for the contact time of bouncing jets. We further investigate the transition of colliding jets from non-coalescence to coalescence, which seems to be caused by instability of the fluid interface. A dimensionless parameter, which is a function of the Normal Weber Number, Normal Reynolds Number and the angle of inclination of the jets, quantitatively dictates the transition.

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Date submitted: 03 Aug 2012

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