



# Varying Viscosity Droplet Impingement

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We examine the impact dynamics and resulting mixing characteristics of a single droplet vertically impacting a sessile droplet placed on a superhydrophobic surface. The effect of varying the viscosity of each droplet is investigated. The images are obtained by using a delayed flash to stop the motion, thus each image is from a different impact but captured at later times. In the images, the red liquid consists of a 1:1 parts by volume water-glycerol mixture with a resulting viscosity six times greater than water (colored blue) and all of the droplets are released 17 cm above the sessile droplet. The top row reveals a water on water droplet impact. Uniform impact, spreading, and coalescence is captured. The second row depicts a droplet of water impacting a sessile water-glycerol droplet. Upon impact, the less viscous water deforms more quickly and wraps around the more viscous glycerol mixture. The droplets spread and coalesce, producing the beautiful gradient in the rebounding jet. The third row depicts a droplet of glycerol mixture impacting a sessile water droplet. Again, the water droplet experiences greater deformation upon initial impact. A similar spread and coalescence is shown with the absence of a jet in the considered time. A jet similar in magnitude and shape to that created by the water on glycerol mixture impact is formed shortly after the last image in the sequence.

