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The Effect of Disturbances and Surrounding Air on the Droplet Impact Phenomena ANDREW WORK, YONGSHENG LIAN, University of Louisville, MARK SUSSMAN, University of Florida — Supercooled Large Droplets (SLDs) represent an icing hazard in a number of areas, most obviously in aviation. SLDs pose a hazard above smaller supercooled droplets because they don't freeze completely on impact, and can spread or splash. Experiments have demonstrated that surrounding air plays an important role in the droplet impact phenomena: a low ambient pressure can suppress the droplet splashing. However, the effect of surrounding air on the droplet impact has not been adequately addressed. Numerical simulations are conducted to systematically investigate the interplay between the droplet and the surrounding air in the droplet splashing regime. Disturbances originating from the experimental droplet generator are also studied in the simulation. We investigate whether these disturbances are responsible for the fingering observed in experimentation. We compare the results of several perturbations on the droplet, as well as the effect of surface roughness. Simulations are conducted using the Moment of Fluid numerical method, and the grid features adaptive mesh refinement.

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