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Afterlife of a Drop Impacting a Liquid Pool[1] ABHISHEK SAHA, YANJU WEI, XIAOYU TANG, CHUNG K. LAW, Princeton University — Drop impact on liquid pool is ubiquitous in industrial processes, such as inkjet printing and spray coating. While merging of drop with the impacted liquid surface is essential to facilitate the printing and coating processes, it is the afterlife of this merged drop and associated mixing which control the quality of the printed or coated surface. In this talk we will report an experimental study on the structural evolution of the merged droplet inside the liquid pool. First, we will analyze the depth of the crater created on the pool surface by the impacted drop for a range of impact inertia, and we will derive a scaling relation and the associated characteristic time-scale. Next, we will focus on the toroidal vortex formed by the moving drop inside the liquid pool and assess the characteristic time and length scales of the penetration process. The geometry of the vortex structure which qualitatively indicates the degree of mixedness will also be discussed. Finally, we will present the results from experiments with various viscosities to demonstrate the role of viscous dissipation on the geometry and structure formed by the drop.

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