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Time-resolved imaging studies of adjacent liquid jet formation[1]
JULIA YANG, Carnegie Mellon University, FREDERIK BRASZ, CRAIG ARNOLD, Princeton University, ARNOLD GROUP COLLABORATION — Laser-induced jetting of liquids is an area of interest in fluid dynamics due to its versatile range of applications in printing and patterning. In this work, we use time-resolved imaging to examine the formation of two adjacent liquid jets produced by separate laser pulses of similar energy. A laser pulse is absorbed within a polymer layer coated with ink, forming a rapidly expanding blister that induces a liquid jet. The time delay and spatial separation between pulses are varied, and for close enough proximities, the second jet exhibits changes in propagation direction. As the separation between pulses decreases, the jets intertwine and form one long, twisted jet or a single large jet. The time-resolved images are also compared with simulation results, which reveal similar trends. This scenario of two adjacent liquid jets provides insight into high repetition rate printing and the limitations of separation and time delay between pulses.

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