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**Two-jet phenomenon during the droplet impact on liquid pools with large viscosity ratios** ZHIZHAO CHE, QUAN DING, TIANYOU WANG, Tianjin University — The impact of droplets on liquid pools is a ubiquitous phenomenon in nature and many industrial applications. It is widely known that a Worthington jet may be produced when a droplet impacts onto a liquid pool. In this experimental study, we increased the viscosity ratio between the droplets and the liquid pool and tune the impact parameters in a wide range to explore the jet phenomena during droplet impact. We found a two-jet phenomenon during the impact of a viscous droplet on a less viscous pool in a certain range of the Weber number, i.e., two jets appear successively during one impact event. Besides the classical Worthington jet, there is another jet before the Worthington jet: the liquid in the pool climbs upward along the surface of the droplet, and finally collides on the apex of the droplet, resulting in a 'surface-climbing' jet. The two-jet phenomenon is jointly controlled by the droplet-pool viscosity ratio and the droplet Weber number. Speed of the surface-climbing jet is high, i.e., an order of magnitude higher than the impact speed.

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