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**Impact of a compound drop produces fine radial jetting**[1] SIGURDUR THORODDSEN, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia, JIAMING ZHANG, Physics of Fluids Group, University of Twente, The Netherlands, ERQIANG LI, University of Science and Technology of China, Hefei, China — We study the impact of a compound drop on a solid surface and the fine radial jets, which emerge at high speed near the solid substrate. The drop is made in a flow-focusing micro-fluidic device feeding smaller droplets into the pendent drop at a nozzle. The outer continuous phase consists of water-glycerin mixtures of various viscosities, while the disperse-phase inner droplets are of a much heavier perfluorohexane liquid. The inner droplets therefore sink to the bottom of the pendent drop before its release from the nozzle. We use a handful of inner droplets which can arrange into regular patterns around the axis of symmetry. The early impulsive stage of the impact forms a radial jet under each of the inner droplets, which emerge at about 8 times faster than the drop-impact velocity, but are only 40 microns thick. We use a million fps bottom imaging, through a glass substrate, to show that the jets are formed by flow-focusing under the inner droplets. We systematically change the number of inner droplets and the viscosity of the continuous phase to identify the splashing threshold for this configuration. The interior droplets are greatly deformed and break up into smaller satellites by viscous stretching, involving capillary pinch-off or tip streaming.

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