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Liquid drop impact on a granular surface XIANG CHENG, RUNCHEN ZHAO, QIANYUN ZHANG, HENDRO TJUGITO, Dept of Chemical Engineering and Materials Science, University of Minnesota — We investigate the impact of droplets onto a granular surface - a process that is likely familiar to all of us who have watched raindrops splashing on a sandy ground in a garden or on a beach. Combining high-speed photography with laser profilometry measurement, we experimentally study the 3D morphology of granular craters formed by liquid drop impact. By systemically varying the releasing height of liquid droplets, the wetting properties of granular particles, and the size ratio of droplets to particles, we show a scaling behavior of the size of craters and demonstrate a rich variation of the shape of granular residues in the center of craters. Based on liquid impact dynamics, a simple model is constructed to quantitatively explain the observed crater morphologies. Contrary to previous studies, our result suggests that the capillary interaction between particles and liquid is the main shaping force for the craters, and the drainage of liquid into the granular bed only plays a minor role in the process.

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