Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Role of the Dynamic Contact Angle on Splashing[1] MIGUEL A. QUETZERI-SANTIAGO, Queen Mary University of London, KENSUKE YOKOI , Cardiff University , ALFONSO A. CASTREJN-PITA, University of Oxoford, J. RAFAEL CASTREJN-PITA, Queen Mary University of London — A drop impacting onto a solid dry substrate can, among other several results, splash or spread over the solid surface. The result depends not only on the droplet properties and speed, but on a wide range of parameters. Although many studies have aimed at finding scaling arguments to characterise splashing, the exact combination of parameters and their influence have remained elusive. In this work we perform a systematic study of liquid droplets impacting onto various solid substrates ranging from completely wetting to superhydrophobic. The experimental approach uses high-speed imaging and image analysis to recover the contact angle as a function of the spreading velocity. We show that, under our experimental conditions, liquids spread with a maximum advancing contact angle greater than 87 degrees, regardless of the liquid or substrate properties. Our results also show that existing dimensionless groups, i.e. the splashing parameter (K) and the capillary number (Ca), are not appropriate to characterise the splashing behaviour. Finally, we show that the splashing ratio β and the maximum dynamic advancing contact angle, appropriately divides the splashing and no-splashing behaviour.

[1]Royal Society (Grants No. URFnRn180016 and No. RGFnEAn18002), the EPSRC (Grant No. EP/P024173/1), the Mexican Energy Ministry (SENER), CONACyT Mexico, and the Welsh European Funding Office (WEFO)

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Date submitted: 13 Jun 2019 Electronic form version 1.4