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Liquid-grain mixing suppresses droplet spreading and splashing during impact DEVARAJ VAN DER MEER, SONGCHUAN ZHAO, RIANNE DE JONG, University of Twente — Would a raindrop impacting on a coarse beach behave differently from that impacting on a desert of fine sand? We study this question by a series of model experiments, where the packing density of the granular target, the wettability of individual grains, the grain size, the impacting liquid, and the impact speed are varied. We find that by increasing the grain size and/or the wettability of individual grains the maximum droplet spreading undergoes a transition from a capillary regime towards a viscous regime, and splashing is suppressed. The liquid-grain mixing is discovered to be the underlying mechanism. An effective viscosity is defined accordingly to quantitatively explain the observations.

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