**121st MSS-Seminar**
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# Raindrop impact on sand

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Liquid droplets impacting on a granular layer are very common in nature, industry, and agriculture, ranging from raindrops falling onto the desert sand or soil to granulation in the production process of many pharmaceuticals. As a droplet impacts upon a granular substrate, both the intruder and the target undergo deformations, during which the liquid may penetrate into the substrate. These three aspects together distinguish it from other impact phenomena in the literature, and add new dimensions to the parameter space of droplet impact phenomena. To get insight in the uniqueness of this impact phenomena we begin with a question: Would a raindrop impacting on a coarse beach behave differently from that impacting on a desert of fine sand? If the answer is yes, then how they are different?
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.