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**Water Retention of Sandy Soil with Hydrogel Particle Additives under Steady Rain** YULI WEI, 1. Department of Physics and Astronomy, University of Pennsylvania ; 2. Complex Assemblies of Soft Matter, CNRS-Rhodia-UPenn UMI 3254, DOUGLAS DURIAN, Department of Physics and Astronomy, University of Pennsylvania —
We probe the water retention behavior of a dry model sandy soil with hydrogel particle additives under a steady rain using a self-built raindrop impingement set-up. The 0.4mm dry hydrogel particles are sent into a dry model sandy soil, 1mm glass beads, in different methods and a steady rain is created to irrigate the soil packing. The mass of the retained water in the packing is measured as a function of rain time. The influences of packing height, gel concentration, and gel location are examined respectively. For the model sandy soil alone, the packing height has little effect on the results. Rain water wets a shallow top region and flows out through a narrow path in the packing. With hydrogel particles uniformly mixed into the top region of a model sandy soil packing, the retained water increases as the gel number ratio increases or when the hydrogel particles are concentrated into the wet top region. A better way is to place hydrogel particles in a layer at certain depths under soil surface. The wet gel layers formed during the rain not only lock water inside but also clog the water path and force rain water to wet other dry soil regions. The clogging efficiency is determined by the wet gel layer number and the soil confinement.

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