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Capillary transport of droplets on 3d printed conical structures JOSEPHINE VAN HULLE, FLORIANE WEYER, STEPHANE DORBOLO, NICOLAS VANDEWALLE, University of Liege — In most arid regions like deserts, plants and animals have developed specific strategies (such as spines) in order to survive long periods without water. Recent works have proposed that conical shapes could trigger the motion of droplets wrapping this fiber towards the plant thanks to some capillary asymmetry. The aim of this research is to show that it is possible to achieve such capillary transport with macroscopic 3d printed conical structures. The motion of silicon oil droplets on these cones is recorded with a CCD camera in order to collect the droplet positions and speeds. A change in the geometry of the droplet from a barrel to a clam-shell shape is observed depending on the half-angle of the cone and the droplet volume. This induces different dynamics of the droplet along the cone. In fact, this change suggests a transition in the dissipation from a bulk to a contact line dissipation. We present experimental results as well as a model for describing these dynamics. The results obtained herein could be used to develop smart ways for manipulating droplets.

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