

Abstract Submitted
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Evaporation control of a drop on fibers CAMILLE DUPRAT, AL-
ISON D. BICK, HOWARD A. STONE, Princeton University — The evaporation
dynamics of mist from a fibrous material has important industrial and environmen-
tal consequences. In order to understand the drying kinetics of a fiber array, we
study a drop sitting on two parallel fibers and, in particular, investigate how the
structure and mechanical properties of the material affect the drying dynamics. A
drop deposited on two parallel fibers can adopt different shapes, depending on the
drop volume, the interfiber distance, the surface tension of the liquid and the fiber
radius and elasticity. A given volume of liquid on a given pair of fibers can adopt two
distinct morphologies. These two states exhibit different drying kinetics that greatly
affects the overall drying time. In addition, flexible fibers undergo deformation that
leads to spontaneous spreading, hence to an increased drying rate. The drying ki-
netics is thus controlled by the fiber elasticity. Furthermore, during evaporation,
the drop can change morphology, which counterintuitively results in an increased
wetted area during drying.

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