

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Sophisticated compound droplets on fiber networks¹ FLORIANE WEYER, MARJORIE LISMONT, LAURENT DREESEN, NICOLAS VANDEWALLE, University of Liege — Droplets on fibers are part of our everyday lives. Indeed, many phenomena involve drops and fibers such as the formation of dew droplets on a spiderweb, the trapping of water droplets on cactus spines or the dyeing of cotton or wool fibers. Therefore, this topic has been widely studied in the recent years and it appears that droplets on fibers can be the starting point for an open digital microfluidics. We study the behavior of soapy water droplets on a fiber array. When a droplet slides along a vertical fiber and encounters a horizontal fiber, it can either stick there or continue its way. In the latter case, the droplet releases a tiny residue. We study the volume of these residues depending on the geometry of the node. By using this technique, a large number of small droplets can be trapped at the nodes of a fiber array. These residues can be encapsulated and collected by an oil droplet in order to create a multicomponent droplet. Moreover, by using optical fibers, we can provoke and detect the fluorescence of the inner droplets. Fibers provide therefore an original way to study compound droplets and multiple reactions.

¹F. Weyer is financially supported by an FNRS grant. This work is also supported by the FRFC 2.4504.12.

Floriane Weyer
University of Lige

Date submitted: 31 Jul 2015

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