

Interfacial dripping faucet: generating monodisperse liquid lenses

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The dripping faucet is familiar to many liquid matter scientists, both because of its practical use as a tool to generate monodisperse droplets [1], and its rich behaviour as a dynamical system [2]. In this work, we present a surface analogue to a dripping faucet, where a viscous liquid slides down an immiscible liquid meniscus (Fig. 1). Periodic pinch-off of the dripping filament is observed, generating a succession of monodisperse floating droplets – also called liquid lenses [3]. We show that this interfacial dripping faucet can be described analogously to its single-phase counterpart, replacing surface tension by the spreading coefficient, and even undergoes a transition to a jetting regime [4]. This liquid/liquid/gas configuration opens perspectives for the study of the dynamics of emulsions at interfaces, which are involved for instance in flotation processes, enhanced oil recovery, and food science.

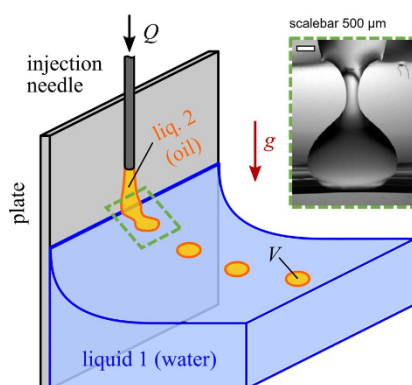


Figure 1. Illustration of the "interfacial dripping faucet" geometry.

References:

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