

Abstract Submitted
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Meanders in a Hele-Shaw cell NOLWENN LE GRAND, ADRIAN DAERR, LAURENT LIMAT, PMMH Laboratory — If a rivulet is injected at the top of a Hele-Shaw cell, it is not necessarily straight. Above a critical flow rate, and if under conditions of total wetting, the rivulet can meander and one can see the pattern travel. Experiments were performed with several surfactant solutions (dish-washing Fairy liquid, SDS, Triton-X) and also with silicone oils. We have found that the behavior of the waves was not the same, depending on whether the surfactant has a rigid or mobile interface. Downward and above all upward traveling meanders have been seen for rigid interfaces, whereas there are only downward traveling interfaces for mobile interfaces. We have also investigated on the consequences of a change in surfactant concentration. If too concentrated, the meanders have smaller amplitudes, suggesting a possible effect of the gradients of surface tension. Finally, the experiments with silicone oil also exhibited meanders, though traveling much faster than the surfactant ones, and always downward. With these oils, there is no surface tension gradient, wetting meanders are created by purely hydrodynamic means.

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