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Flow through a thin film on non-flat substrates CIRO SEMPREBON, Max Plank Institute for Dynamics and Self Organization, MARTIN BRINKMANN, Saarbucken Universty — The ability of liquids to form films on surfaces is essential for many technical applications such as the coating of surfaces or the liquid transport. While for many heterogeneous materials it is possible to introduce effective material properties from spatial averaging, here close to the percolation transition the size of a representative domain becomes comparable to the size of the whole system. In this work we investigate the morphological evolution and the transport properties of a thin wetting layer adhering to an irregular rough substrate. Static film profiles are obtained by numerically minimizing the interfacial energy including a generic short ranged interface potential to account for a precursor film and a finite apparent contact angle. Assuming that the flow does not alter the profile of the liquid meniscus, we employ the static film configurations resulting from the energy minimization to solve the linearized steady thin film equation and obtain the total volume flux. Our results show that the connectivity between liquid domains plays a key role in predicting the transport properties of the liquid interface.

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