

Abstract Submitted
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Wave regimes in two-layer microchannel flow¹ CHRIS LAWRENCE, Institute for Energy Technology, Norway, GRIGORI SISOEV, University of Birmingham, DANIELE SILERI, OMAR MATAR, Imperial College London — We consider vertical channel flow of two immiscible fluids separated by an interface. Varying the flow conditions, the problem is reduced into the falling film flow case, and we consider values of the Reynolds number when only the film instability mechanism exists. To describe the wave regimes present, nonlinear evolution equations for the interface and flow rate of one of layers are derived by applying the Karman-Pohlhausen method in conjunction with boundary-layer theory. Use of bifurcation analysis allows us to identify the various families of steady travelling waves in the microchannel flow as a function of system parameters.

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