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Wave regimes in two-layer channel flow[1] GRIGORI SISOEV, University of Birmingham, DANIELE SILERI, Imperial College London, CHRIS LAWRENCE, Institutt for Energiteknikk, Norway, OMAR MATAR, Imperial College London — Interfacial instabilities in two-layer channel flow are studied at moderate flow rates. We use the integral method in conjunction with the Karman-Polhausen approximation to derive coupled evolution equations for the interfacial position and the flow rate in either of the two layers; a similar approach has previously been used to model laminar film flows. Bifurcation theory is used to determine the dependence of the emerging regimes of travelling waves on system parameters. Transient numerical simulations are also carried out, which provide insight into the selection mechanisms of stable waves.

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