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**Absolute and convective instabilities in film flow over inclined topography** DMITRI TSELUIKO, Department of Mathematical Sciences, Loughborough University, MARK BLYTH, School of Mathematics, University of East Anglia, DEMETRIOS PAPAGEORGIOU, Department of Mathematics, Imperial College London — The stability of a liquid film flowing under gravity down an inclined wall with periodic corrugations is analyzed. A long-wave equation valid at near-critical Reynolds numbers is used to study the film dynamics. Steady solution branches are computed including subharmonic branches, for which the period of the free surface is an integer multiple of the wall period, and the existence of quasi-periodic branches is demonstrated. Stability analysis of steady periodic solutions shows that under certain conditions, and depending on the wall period, the flow may be convectively unstable for small wall amplitudes but undergo transition to absolute instability as the wall amplitude increases. The predictions of the linear theory are corroborated by time-dependent simulations of the model equation.

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