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Effect of Bottom Undulations on the Stability of Film Flow Down Inclined Planes

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We study the effect of bottom undulations on the stability of a stationary film flow down inclined planes. Allowing for rather moderate bottom variations, we carry out a linear stabil-ity analysis and show how the wavy bottom affects the instability. Contrary to results for weakly undulated bottoms described in literature, where the instability is identical to that over a flat incline, we obtain an increase of the critical Reynolds number and a smaller un-stable frequency spectrum with respect to the flat bottom in accordance with experimental observations.

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