STABILITY OF REGULARIZED SHOCK SOLUTIONS IN COATING FLOWS

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We consider a model for thin liquid films in a rotating cylinder in the small surface tension limit. Using numerical computations, we show that the existence curves of regularized shock solutions on the mass-flux diagram exhibit loops. The number of loops increases and their locations move to infinity as the surface tension parameter decreases to zero. If n is the number of loops in the mass-flux diagram with $2n + 1$ solution branches, by analyzing spectral properties of a related forth order non-self-adjoint operator, we show that $n + 1$ solution branches are stable with respect to small perturbations.