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On stability of waves in liquid films on vibrating substrates

The effect of vibration on the stability of liquid films is of primary importance for many industrial applications. Using the model derived by Shklyaev, Alabuzhev, and Khenner, we show that all periodic and solitary-wave solutions of this equation are unstable regardless of their parameters. Some of the solitary waves, however, are metastable (i.e., still unstable, but with extremely small growth rates) and, thus, can persist without breaking up for a very long time. We study the dynamics of these waves analytically and numerically.

Joint work with E. Benilov (University of Limerick).