Stability of Viscous Roll Waves

Blake Barker[1], Mathew Johnson*[2], Pascal Noble , Luis Miguel Rodrigues[3,4], and Kevin Zumbrun

[1]Division of Applied Mathematics (DAM) – 182 George Street Providence, RI 02912, United States
[2]University of Kansas, Department of Mathematics (KU) – Lawrence, Kansas, 66045, USA, United States
[3]KALiFFE (UCBL / INRIA Grenoble Rhône-Alpes / INSMI) – INSMI (CNRS), INRIA, Université Claude Bernard - Lyon I (UCBL) – Institut Camille Jordan, Université de Lyon Université Claude Bernard, 43, boulevard du 11 Novembre 1918, F-69622, Villeurbanne cedex, France
[4]Institut Camille Jordan (ICJ) – Institut National des Sciences Appliquées [INSA], Ecole Centrale de Lyon, Université Claude Bernard - Lyon I (UCBL), CNRS : UMR5208, Université Jean Monnet - Saint-Etienne, Institut National des Sciences Appliquées [INSA] – Bât. Jean Braconnier n 101 43 Bd du 11 novembre 1918 69622 VILLEURBANNE CEDEX, France

Abstract

Roll-waves are a well observed hydrodynamic instability occurring in inclined thin film flow, mathematically described as periodic traveling wave solutions of the St. Venant system. In this talk, I will discuss recent progress concerning the spectral and nonlinear stability of viscous roll-waves in a variety of asymptotic regimes, including near the onset of hydrodynamic instability, large-Froude number analysis, and (possibly) in the inviscid limit.

*Speaker