1089-35-224 **Mathew Johnson*** (matjohn@math.ku.edu), 1460 Jayhawk Blvd., Lawrence, KS 66045, and **Pascal Noble**, **L. Miguel Rodrigues** and **Kevin Zumbrun**. *On the Spectral Stability of Viscous Roll Waves.*

Viscous roll waves are a well observed phenomenon occurring in shallow water flow down an inclined ramp, generated by competition between gravitational force and friction along the bottom. Such patterns have been used to model phenomena in several areas of engineering, including landslides, river and spillway flow, and the topography of sand dunes and sea beds. While their stability properties have been much studied numerically, experimentally, and by formal asymptotics, a rigorous investigation of the spectral stability of such waves has so far been lacking. In this talk, we discuss recent progress in this direction. In particular, we report on the the stability of such roll waves near the onset of instability in the viscous St. Venant equations for shallow water flow. In this limit, the governing amplitude equation reduces to a dispersion modified Kuramoto-Sivashinsky equation in the zero-dissipation limit, and can hence be viewed as a singular perturbation of the integrable KdV equation. Utilizing asymptotic ODE theory, direct Evans function calculations, and Whitham modulation theory, we are able to reduce the stability of such Kuramoto-Sivashinsky waves to the numerical evaluation of an elliptic integral. (Received February 15, 2013)