1014-35-1204 **Changbing Hu*** (cbhu@math.missouristate.edu), Department of Mathematics, Missouri State University, Springfield, MO 65897, and **Peter Howard**. *Nonlinear stability of viscous shock waves arising in conservation laws in the presence of both second and fourth order regularizations.* Preliminary report.

In the study of thin films, a conservation law with second and fourth order regularization are derived to describe the motion of fluid coating a pre-wetted surfaces. An interesting feature of this equation is that both compressive and undercompressive waves can be solutions. Some numerical investigation by Bertozzi, Munch and Shearer shows that the undercompressive waves can be stabe. Motivated by this study, we consider the question of nonlinear stability of viscous shock waves arising from these equations by assuming the linear stability. This is a continuation of our study in [1], where we established the nonlinear stabilty for undercompressive waves for d>=3 with only the fourth order regularization. In this talk we establish the nonlinear stability for d=1,2 with the aid of second order regularization.

[1] P. Howard and C. Hu, Nonlinear stability for multidimensional fourth order shock fronts, to appear in "Arch. Rational Mech. Anal". (Received September 27, 2005)