1006-35-43 **Andras Balogh*** (`abalogh@utpa.edu`), Department of Mathematics, The University of Texas - Pan American, Edinburg, TX 78541, and **Jose A Dominguez**. *Inverse Optimal Boundary Feedback Control of a 3D Channel Flow.* Preliminary report.

We examine the stability properties of a periodic channel flow under a boundary feedback control. The control law is derived by using Lyapunov's second method on the perturbation energy (L_2-norm) with the ultimate goal of relaminarizing the flow. We address the questions of well-posedness and stability both analytically and through numerical simulations. The analytical results are restricted to small initial data and Reynolds number, while numerical results show stabilization and drag reduction for a wide range of the critical parameter values. We also present optimality results for our Lyapunov based boundary feedback control. (Received January 24, 2005)