

The Southwest Mechanics Lecture Series

at

Texas A&M University

FEEDBACKS FOR FLUID FLOWS AND FUSION

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Mechanical and Aerospace Engineering

Date: Wednesday 12 November 2003

Time: 4:10 pm

Location: Richardson, Room 106

Abstract

In this seminar I will present tools for flow control from the prospective of a control algorithm designer. I will overview results on stabilization of turbulent flows, often motivated by drag reduction in aerospace applications. I will also present techniques for turbulence enhancement by feedback, which are useful in improving mixing in combustion applications. Both stabilization and mixing will be presented in benchmark flow geometries like channel, bluff body, pipe, and jet flows. To illustrate efforts in more complex geometries, I will present result for instabilities arising in jet engines: rotating stall and thermoacoustic oscillations. Plasmas and liquid metals in fusion reactors are examples of fluid flows that call for active control of their magnetohydrodynamic and other phenomena. I will present some results on control of "burn instability," control of kinetic profiles, and vertical stabilization in tokamaks.



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