Department of Mathematical Sciences
The University of Texas at El Paso

Colloquium

Andras Balogh

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Friday, October 29, 2010 at 2:00 p.m. in Bell Hall 143

Observer-Based Boundary Feedback Stabilization of a Shear Beam

We consider a model of the undamped shear beam with a destabilizing boundary condition. The motivation for this model comes from atomic force microscopy, where the tip of the cantilever beam is destabilized by van der Waals forces acting between the tip and the material surface. In order to stabilize the shear beam we combine of the classical "damping boundary feedback" idea with a recently developed backstepping approach. A change of variables is constructed which converts the beam model into a wave equation with boundary damping. The observer design is a dual of the similar ideas, combining the damping feedback with backstepping, adapted to the observer error system. Both stability and well-posedness of the closed-loop system are outlined, and simulation results are presented. This is a joint work with M. Krsitc, A. Smyshlyaev (UCSD) and B-Z. Guo (Academia Sinica)

For further information, please contact Dr. Emil Schwab, eschwab@utep.edu
Refreshments will be served in front of the colloquium room,
15 minutes before the start of the colloquium.