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Mathematical Challenges Arising from the Questions of Controllability and Stabilization for Complex Elastic Structures. Preliminary report.

In the study of control and stabilization of dynamic elastic systems, a significant challenge is the ability to rigorously address whether linked dynamic structures can be controlled using boundary feedback alone. When a structure is composed of a number of interconnected elastic elements or is modelled by a system of coupled partial differential equations, the behavior becomes much harder to both predict and to control.

Structures composed of multiple layers or components of different dimensions pose serious challenges because the energy transferred through the interfaces between components can lead to uncontrollable behavior. This talk focuses on issues that arise when attempting to understand the control and stability of such complex systems. (Received August 24, 2015)