

Author:

Birgit Jacob (University of Wuppertal)

Title:

On input-to-state-stability and integral input-to-state-stability for parabolic boundary control systems

Abstract:

It is well known, that the notions *input-to-state stability* and *integral input-to-state stability* are equivalent for finite-dimensional linear systems and even for infinite-dimensional systems of the form

$$\frac{d}{dt}x = Ax(t) + Bu(t); x(0) = x_0; \quad (1)$$

where A generates a C_0 -semigroup on a Banach space X and B is a linear bounded operator from another Banach space U to X . In this talk we study the relation of these two notions for linear infinite-dimensional systems of the form (1) with a (possibly) unbounded control operator. We show that integral input-to-state stability implies input-to-state stability. For parabolic diagonal systems, the notions are even equivalent. In particular, a simple criterion for input-to-state stability is derived. This is joint work with R. Nabiullin (Wuppertal), J.R. Partington (Leeds) and F. Schwenninger (Hamburg).