

Author:

Hans Zwart (University of Twente, The Netherlands)

Title:

Stabilization of infinite dimensional port-Hamiltonian systems by non-linear dynamic boundary control

Abstract:

The conditions for existence of solutions and stability, asymptotic and exponential, of a large class of boundary controlled systems on a 1D spatial domain with non-linear dynamic boundary control are given. The non-linear boundary controller is considered to be passive, with non-linear potential energy function and damping matrix. It is shown that under very natural assumptions the solutions of the partial differential equation with the non-linear dynamic boundary conditions exist globally. Furthermore, when energy dissipation is present in the controller, then it globally asymptotically stabilizes the partial differential equation. The class of equations under study encompass a large class of physical distributed parameter systems with non-linear actuation at their boundaries.

Joint work with Hector Ramirez and Yann Le Gorrec.