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Global Exact Controllability of an Analytic and Nonlinear Thermoelastic System

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Abstract

In this work we give a result of exact controllability for a semilinear thermoelastic system, in which the control term is placed solely in the thermal equation. With such an indirect control input, one is able to control exactly the mechanical displacement and velocity of the plate, as well as the temperature. This exact controllability occurs in arbitrarily small time. In particular, one is provided with a result of exact controllability for a thermoelastic system, whose linearization is modelled by the generator of an *analytic* semigroup. The proof of this result depends upon the reachability for the linear system, which has recently been established. In addition, the underlying analyticity of the linear semigroup plays a key role in the analysis, inasmuch as it allows an invocation of a fixed point theorem which is applicable to special *compact* maps.