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Interior controllability of the thermoelastic plate equation. (English) Zbl 1243.93019
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Summary: In this paper we prove the interior controllability of the thermoelastic plate equation

$$\begin{cases} w_{tt} + \Delta^2 w + \alpha \Delta w = 1_\omega u_1(t, x), & \text{in } (0, \tau) \times \Omega, \\ \theta_t - \beta \Delta \theta - \alpha \Delta w_t = 1_\omega u_2(t, x), & \text{in } (0, \tau) \times \Omega, \\ \theta = w = \Delta w = 0, & \text{on } (0, \tau) x \partial \Omega, \end{cases}$$

where $\alpha \neq 0, \beta > 0, \Omega$ is a sufficiently regular bounded domain in $\mathbb{R}^N (N \geq 1), \omega$ is an open nonempty subset of $\Omega, 1_\omega$ denotes the characteristic function of the set ω and the distributed control $u_i \in L^2([0, \tau]; L^2(\Omega)), i = 1, 2$. Specifically, we prove the following statement: For all $\tau > 0$ the system is approximately controllable on $[0, \tau]$. Moreover, we exhibit a sequence of controls steering the system from an initial state to a final state in a prefixed time $\tau > 0$.

MSC:

93B05 Controllability

93C25 Control/observation systems in abstract spaces

Cited in **3** Documents

Keywords:

interior controllability; thermoelastic plate equation; strongly continuous semigroups

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