

The critical case of clamped thermo-elastic systems with interior point control: Optimal interior and boundary regularity results

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Abstract

The talk will be mostly based on the author's paper by the same title (to appear in *Journal of Differential Equations* in 2008). It deals with clamped, hyperbolic-dominated thermo-elastic equations defined on a bounded domain, with interior point control. It gives optimal interior and boundary regularity results—which provide a preliminary setting before an optimal control problem can be properly set. The critical case of the title refers to dimension $d = 2$. The cases of $d = 1, 3$ (and clamped boundary conditions) were previously obtained in the author's paper that appeared in *DCDS* (Suppl), 2007, 993–1004, with optimal results. [The more amenable hinged case was previously treated in the author's paper that appeared in *J. Math. Anal. and Appl.*, 313 (2007) 530–542]. In the case $d = 2$, some pathology is encountered in the clamped case, due to the incompatibility of the boundary conditions of some fancy spaces, that forces a radically different approach to the problem.

All these works on thermo-elastic equations reduce the problem to corresponding elastic equations (which was studied in the author's paper (*Journal of Differential Equations* 103 (1993), 394–421), with the same boundary conditions and point control.