



Seminars on Differential Equations (2018.2)

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UFSC

EXACT CONTROLLABILITY OF THE WAVE EQUATION WITH DIRICHLET BOUNDARY
CONDITION

Abstract

Let Ω be a bounded domain in \mathbb{R}^n with boundary of class \mathcal{C}^2 . Consider the wave equation with the Dirichlet boundary condition:

$$\begin{cases} u_{tt}(t, x) - \Delta u(t, x) = h(t, x), & t > 0 \text{ and } x \in \Omega \\ u(t, x) = u_t(t, x) = 0, & t > 0 \text{ and } x \in \partial\Omega \\ u(0, x) = u_0(x), & x \in \Omega \\ u_t(0, x) = u_1(x), & x \in \Omega. \end{cases}$$

In this seminar we will study the exact controllability problem, that is, we will prove the existence of a time $T > 0$ such that for each initial data $\{u_0, u_1\}$ there exists a control $h = h(t, x)$ such that the solution to the above problem satisfies

$$u(T, x) = u_t(T, x) = 0.$$

References

- [1] E. Zuazua, *Controlabilidad exacta y estabilizacion de la ecuacion de ondas*, Textos de Métodos Matemáticos 23, IM-UFRJ, 1990.
- [2] J. L. Lions, *Exact controllability, stabilization and perturbations for distributed systems*. SIAM Rev. 30 (1988), 1–68.
- [3] D. L. Russell, *Controllability and stabilizability theory for linear partial differential equations*. Recent progress and open questions. SIAM Rev. 20 (1978), 639–739.

Thursday - September 13th, 2018

14:00 - 15:00

Room 202 - Maths Department

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