

SIMION STOILOW INSTITUTE OF MATHEMATICS OF THE ROMANIAN ACADEMY

## IMAR Monthly Lecture

# Time optimal controls for some infinite dimensional systems

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**Abstract:** Time optimal control, with a point target, is a classical problem for time invariant linear systems. In the finite dimensional case it is known from the fifties that time optimal controls satisfy Pontryagin's maximum principle and that they are bang-bang. We present some extensions of these results to infinite dimensional linear systems. More concretely, we consider the time optimal control problem for an infinite dimensional system described by the Kirchhoff plate equation with distributed control. We prove that time optimal controls have a bang-bang property and, consequently, that they are unique. The main ingredients used to achieve this goal is a new approximate observability property from measurable sets for the system described by the Kirchhoff equation and an abstract result for systems with skew-adjoint generator. Joint work with Marius Tucsnak and Ionel Roventa.