

**Linear differential equations with positive evolution  
on ordered Banach spaces.  
Applications to control problems.**

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In the first part of my talk I'll recall the definition of the differential equations with a causal (anticausal) positive evolution on an ordered Banach space. Some specific aspects regarding the characterization of the exponential stability of such a kind of differential equations will be emphasize.

In the second part of this lecture, I'll show how the specific properties of some linear differential equations with positive evolution are used in the derivation of some results from optimal control field, as:

- the derivation of some sufficient conditions for exponential stability in mean square of stochastic systems described by singularly perturbed linear Itô differential equations,
- the problem of the designing of a stabilizing composite control for systems modeled by singularly perturbed linear Itô differential equations with Markovian jumping,
- the problem of the suboptimal linear quadratic regulator in the case of systems modeled by singularly perturbed linear Itô differential equations,
- conditions for the existence of a Nash equilibrium strategy for a linear quadratic differential game associated to a positive system.