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Título : Theoretical and numerical aspects of the control of PDEs

Resumo:

These Lectures deal with some recent results concerning the control of systems governed by some PDEs. The aim is to present some fundamental results, some applications and several open problems.

In Lecture 1, I will review some basic concepts and results. Here, the 1D heat equation will serve to illustrate the main achievements and difficulties.

Lecture 2 is devoted to systems of the Navier-Stokes kind. We will analyze the local exact controllability to the trajectories and some related questions from the theoretical and numerical viewpoints. We will also indicate a lot of questions and possible strategies.

Finally, Lecture 3 is devoted to the study of other control problems arising in applications. In particular, I will present results concerning the control of turbulence, hierarchical controllability and the control of free boundaries.

Along these Lectures, a set of questions (some of them easy, some of them more intricate or even difficult) will be stated. Also, several open problems will be mentioned. I hope that all this will help to understand the underlying concepts and results.