

Some results about optimal control problems with the wave equation

Martin Gugat, Universität Nürnberg-Erlangen

The wave equation is a good model for systems governed by hyperbolic systems of partial differential equations.

The exact controllability properties of the system are well-studied and allow to prove the existence of solutions of interesting optimal control problems.

We consider problems of optimal boundary control with the L^1 , L^p and L^∞ norms of the controls as objective functions and explain the structure of the optimal controls.

Moreover, we analyze penalty approaches for the numerical approximation of the optimal controls.

We also consider the optimal boundary control of a string to rest in finite time with continuous state. Moreover, we present numerical results for the optimal distributed control of the wave equations subject to state constraints.