

Two problems concerning the exact controllability of distributed parameter systems

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Abstract

As the title indicates, the two following problems will be addressed. (1^o) Based on some ideas by D. L. Russell, a numerical algorithm to compute the boundary exact control of linear, time-reversible, distributed parameter systems will be presented. The method will be illustrated with several numerical simulations for the Klein-Gordon and the Euler-Bernoulli equations in 1D, and the plate equation and the linear system of elasticity in 2D. (2^o) We will consider the nonlinear optimal design problem which consists in finding the best shape and position of the support of the internal null control of minimal L^2 -norm for the 1D wave and heat equations. Of course, a constraint on the size of the support of the control is imposed. We will review on some recent results concerning well-ill posedness, relaxation and numerical resolution of this problem.