Adaptive FEM for distributed optimal control problems subject to the wave equation with variable energy regularization

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We present a space-time finite element approach for a distributed optimal control problem for the wave equation. We will consider the cases of $L^2(Q)$- and energy regularization, using a modified variational formulation and a suitable solution space for the wave equation for the latter. A comparison between both approaches, in particular in view of the optimal choice of the relaxation parameter, is carried out. Numerical examples, including an adaptive refinement strategy, are given.

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