INTERNAL EXACT OBSERVABILITY OF A PERTURBED EULER-BERNOULLI EQUATION*

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Abstract

In this work we prove that the exact internal observability for the Euler-Bernoulli equation is robust with respect to a class of linear perturbations. Our results yield, in particular, that for rectangular domains we have the exact observability in an arbitrarily small time and with an arbitrarily small observation region. The usual method of tackling lower order terms, using Carleman estimates, cannot be applied in this context. More precisely, it is not known if Carleman estimates hold for the evolution Euler-Bernoulli equation with arbitrarily small observation region. Therefore we use a method combining frequency domain techniques, a compactness-uniqueness argument and a Carleman estimate for elliptic problems.

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keywords: exact observability, Euler-Bernoulli equation, compactness-uniqueness

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