ESTIMATES FOR SLOW CONTROLS

O. Carja[1,2], A. Lazu[2]

[1] Octav Mayer Institute of Mathematics (Romanian Academy), Iaşi 700505, Romania
ocarja@uaic.ro

[2] Department of Mathematics, "Al. I. Cuza"University, Iaşi 700506, Romania
vieru_alina@yahoo.com

Consider the abstract linear control system

$$y' = Ay + Bu,$$

where A generates a C_0-semigroup on X and $B \in \mathcal{L}(U, X)$, U and X being Banach spaces. The minimum energy to bring $x \in X$ to zero in time $t > 0$ is

$$\mathcal{E}(t, x) = \inf\{\|u\|; u \in L^\infty(0, t; U), y(t, x, u) = 0\}.$$

We study the behavior of $\mathcal{E}(t, x)$, when $t \to \infty$. In fact, we get estimation of the type

$$\mathcal{E}(t, x) \leq \gamma(t)\|x\|,$$

with explicit $\gamma(t)$, for t large. Our results are related to [2], [1], and [3].

References

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OPTIMALITY CONDITIONS IN THE ALTERNANCE FORM

V.F. Demyanov[1], V.N. Malozemov[2]

[1] Applied Mathematics Department, Saint Petersburg State University
Universitetskii prospekt 35, 198504 Peterhof, Saint Petersburg, Russia
vfd@ad9503.spb.edu

[2] Mathematics and Mechanics Department, Saint Petersburg State University
Universitetskii prospekt 28, 198504 Peterhof, Saint Petersburg, Russia
malv@math.spbu.ru

The most important tool used in optimization is that of directional derivative or different generalizations of it. For the class of directionally differentiable functions in the n-dimensional space, a necessary condition