

A question on control parameters in dynamical systems

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Hi gurus,

I have an urgent question on control parameters in dynamical systems.
I would greatly appreciate your help!

Suppose we have a dynamic system as

$\dot{x} = f(x, \beta)$, where x is $n \times 1$ vector and β is a vector
of
continuous-time control variables (with the same dimension as x).

Consider the following optimization problem:

$\min g(x, \beta)$
subject to
 $\dot{x} = f(x, \beta)$
 $0 \leq \beta \leq UB$

Since the objective function is continuous, and the constraint set is
convex and compact, the solution of β must exist.

My question is: if we add one more constraint, $A \leq \beta \leq B$, then whether can we say the constraint set is still convex and compact????

Thank you very much,

Fan

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