



DEPARTAMENTO DE
MATEMÁTICA APLICADA



Seminario de Matemática Aplicada

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Minimal time sequential batch reactors with bounded and impulse controls for one or more species

We consider the optimal control problem of feeding in minimal time a tank where several species compete for a single resource, with the objective being to reach a given level of the resource. We allow controls to be bounded measurable functions of time plus possible impulses. For the one species case, we show that the immediate one impulse strategy (filling the whole reactor with one single impulse at the initial time) is optimal when the growth function is monotonic. For non-monotonic growth functions with one maximum, we show that a particular singular arc strategy is optimal. These results extend and improve former ones obtained for the class of measurable controls only. For the two species case with monotonic growth functions, we give conditions under which the immediate one impulse strategy is optimal. We also give optimality conditions for the singular arc strategy (at a level that depends on the initial condition) to be optimal. The possibility for the immediate one impulse strategy to be non-optimal while both growth functions are monotonic is a surprising result and is illustrated with the help of numerical simulations.

Organizado por el Grupo de Investigación MOMAT (Modelos matemáticos en ciencia y tecnología: desarrollo, análisis, simulación numérica y control) de la UCM, en colaboración con el IMI.

26 de febrero de 2009, 12:00 horas.
Seminario del Departamento de Matemática Aplicada
Facultad de Ciencias Matemáticas, UCM.

