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Optimal boundary control of a system of reaction diffusion equations. (English)

Zbl 1375.49030

ZAMM, Z. Angew. Math. Mech. 90, No. 12, 966-982 (2010).

Summary: In this work, boundary control problems governed by a system of semilinear parabolic PDEs with pointwise control constraints are considered. This class of problems is related to applications in the chemical catalysis. After discussing existence and uniqueness of the state equation with both linear and nonlinear boundary conditions, the existence of an optimal solution is shown. Necessary and sufficient optimality conditions are derived to deal with numerical examples, which conclude the paper.

MSC:

49K20	Optimality conditions for problems involving partial differential equations	Cited in **9** Documents
35K57	Reaction-diffusion equations	
49M30	Other numerical methods in calculus of variations (MSC2010)	
49N10	Linear-quadratic optimal control problems	

Keywords:

optimal control; boundary control; semilinear parabolic system; reaction-diffusion equations; necessary optimality conditions; sufficient optimality conditions

Full Text: DOI

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