Casas, Eduardo

Control of an elliptic problem with pointwise state constraints. (English) Zbl 0606.49017
SIAM J. Control Optimization 24, 1309-1318 (1986).

The paper deals with a control problem for an elliptic equation of second order $Ay = v$ on Ω, $y = 0$ on $\partial\Omega$. The cost functional is of the form

$$J(v) = \int_\Omega (y(v) - y_0)^2 dx + (r/2) \int_\Omega v^2(x) dx, \quad v \in K$$

where K is a convex closed subset of $L^2(\Omega)$, $y_0 \in L^2(\Omega)$. The following control problem is solved: minimize J(v) for $v \in K$ and $|y(v, x)| \leq 1$ for all $x \in \Omega$.

The existence and uniqueness of a solution is proved. Optimality conditions are given and regularity of the optimal solution is investigated.

Reviewer: I.Bock

MSC:

49K20	Optimality conditions for problems involving partial differential equations	Cited in **103** Documents
35J25	Boundary value problems for second-order elliptic equations	
49J20	Existence theories for optimal control problems involving partial differential equations	
35B37	PDE in connection with control problems (MSC2000)	
35D10	Regularity of generalized solutions of PDE (MSC2000)	
46E35	Sobolev spaces and other spaces of "smooth" functions, embedding theorems, trace theorems	
93C20	Control/observation systems governed by partial differential equations	

Keywords:

pointwise state constraints; elliptic equation of second order; existence and uniqueness; Optimality conditions; regularity

Full Text: DOI