On Continuity of Functional Minimum of a Delay Parameter Optimization Problem

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Let us consider the optimization problem with free end

$$\dot{x}(t) = f(t, x(t), x(t-\tau), u(t)), \ \ t \in [t_0, t_1],$$

$$x(t) = \varphi_0(t) \ \ , t < t_0, \ x(t_0) = x_{00},$$

$$J^* = \inf J(w), w = (\tau, u(t)) \in [\theta_1, \theta_2] \times \Omega,$$

where

$$J(w) = q^0(\tau, x(t_1)) + \int_{t_0}^{t_1} f^0(t, x(t), x(t-\tau), u(t))dt \ ,$$

$\theta_2 > \theta_1 > 0$ are given numbers and Ω is the set of measurable control functions $u(t)$ with values in compact U .

It is proved continuity of functional $J(w)$ at the point $w_0 \left(J(w_0) = J^*\right)$ with respect to perturbation of the initial data. The continuity of functional for the optimization problems governed by ordinary and functional differential equations are investigated in [1-3].

References

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