

Variation Formulas of Solution for a Class of Functional Differential Equation Considering Perturbations of the Initial Moment and Delay Parameters

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For the functional differential equation

$$\dot{x}(t) = f_0(t, x(t), x(t - \tau_{10}), \dots, x(t - \tau_{s0})), \quad t \in [t_{00}, t_{10}]$$

with the discontinuous initial condition

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

variation formulas of solution are proved for new classes of variations. In the variation formulas are detected the effects of the discontinuous initial condition and perturbations of delay parameters $\tau_{i0} > 0, i = \overline{1, s}$ and the initial moment t_{00} . The variation formulas of solution for various classes of functional differential equations without perturbation of delay are proved in [1,2].

References

- [1] G. L. Kharatishvili, T. A. Tadumadze, Variation formulas of solutions and optimal control problems for differential equations with retarded argument. *J. Math. Sci. (NY)*, **104**, 1(2007), 1-175 .
- [2] T. Tadumadze, Formulas of variation for solutions of some classes of functional differential equations and their applications. *Nonlinear Analysis*, **71** (2009), 706-710 .