EXACT SOLUTIONS OF AN OPTIMAL STABILIZATION PROBLEM FOR SYSTEMS OF DIFFERENTIAL EQUATIONS WITH AFTEREFFECT

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The direct problem of optimal stabilization for systems of differential equations with aftereffect is related to finding a solution of a boundary value problem for a nonlinear matrix functional differential equation. In the construction of exact solutions of the optimal stabilization problem, it is proposed to pass to the inverse problem of finding an absolutely continuous component of a Stieltjes measure. The inverse problem is described by a matrix linear integral equation of the second kind. Sufficient conditions are obtained under which the inverse problem can be reduced to a boundary value problem for an autonomous linear system of ordinary differential equations. In the solution of this problem, the Laplace transform is used.

Keywords: differential equations with aftereffect, stability of motions, optimal stabilization, differential equations in a Banach space, Riccati equation, functional differential equations, boundary value problem for ordinary differential equations, Laplace transform.

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