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Linear Noetherian boundary value problem for a system of differential-algebraic and difference-algebraic equations

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We construct conditions for the existence of solution of linear Noetherian boundary value problem for a system of differential-algebraic equations [1, 2]. The proposed scheme of studies of differential-algebraic boundary-value problems transferred onto linear differential-algebraic boundary-value problems with variable rank of leading coefficient matrix [3]. We construct conditions for the existence of bounded solution of linear and nonlinear boundary value problem for a system of difference-algebraic equations [4, 5] and systems of integral-differential equations of Fredholm type with degenerate kernel not solved with respect to the derivative [6]. We construct necessary and sufficient conditions for the existence of solution of linear and nonlinear boundary value problem for a matrix differential-algebraic systems [7, 8]. The case of a nonlinear boundary value problem for a matrix differential-algebraic systems in the case of parametric resonance has been researched in papers [9, 10]. We suggest an algorithm for finding solutions of the inhomogeneous generalized matrix equation and, in particular, the Lyapunov and Sylvester [11] equations in general case when the linear matrix operator, corresponding to the homogeneous part of the linear generalized matrix equation, has no inverse [12].

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