Multiperiodic Solutions of the Autonomous Systems with the Operator of Differentiation on the Lyapunov's Vector Field

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Abstract: In this article we consider an autonomous system of a special form with a operator of differentiation whose characteristic system is related with the Lyapunov's systems. The multiperiodicity of zeros of this operator has established. By the methods of the theory of multiperiodic solutions, we prove a theorem on the existence of a unique multiperiodic solution with respect to time variables. The result of the theorem extends to the nonlinear case on the basis of the fixed point method.

The content of the article was the development of a method for investigating the oscillatory solutions of autonomous systems of the form (1). The main essence of the method for investigating the multiperiodic solutions of the system under consideration is a combination of the known methods of [1,2], developed in [3]. In this case, the characteristic system of the operator of differentiation consists of several subsystems of the Lyapunov's class, which generates the multyperiodicity of the solutions of the original system. Note that the developed technique is applicable to a more general system when it contains both time and space variables. The idea of a work is new, which in the simplest case was first tested in [4].

References

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