

On construction of the set of comparison functions of the program motion in the probable statement

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Abstract: The set of first-order Ito stochastic differential equations and set of comparison functions are constructed. There is stability in probability of the given program motion with respect to comparison functions.

Assume that the set

$$(1) \quad \Lambda : \lambda \equiv y - \varphi(t) = 0, \quad y \in R^n, \quad \varphi \in C^1, \quad \|\varphi\| \leq l,$$

is given. It is necessary to construct the corresponding set of Ito stochastic differential equations

$$(2) \quad \dot{y} = Y(y, t) + \sigma(y, t)\dot{\xi}, \quad \xi \in R^k,$$

in the class of equations admitting the existence and uniqueness of solution of the equation (2) for the initial conditions $y|_{t=t_0} = \varphi(t_0)$. And also we need to construct the set of s -dimensional vector-functions $Q(y)$. With respect to the components of $Q(y)$ there is stability in the probability of the set (1).

This stochastic problem is solved by both the Lyapunov functions method [1] and the quasi-inversion method [2].

The given statement of the problem for $\sigma \equiv 0$ is considered in [3, 4].

Keywords: stochastic differential equation, stability in probability, comparison function

2010 Mathematics Subject Classification: 34K29, 60H10

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