UDC 519.95: 621.3

ON THE RELATIONSHIP BETWEEN SOME WAYS OF STOCHASTIC SYSTEMS PROGRAM CONTROL

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Keywords: stochastic system, deterministic and stochastic control.

We call a system a stochastic system if it's states change (including) under the influence of random factor. Let $\alpha(t)$ is a value of the random factor at time t. When the system program control isapplied then we use forecasts of process . Let the quality of system's control in the time interval [0, T] characterized by functional $\cdot, \cdot, \cdot$, where $\cdot$ is control function, $\cdot$ is a subset of the phase space of the system , which stays at the current time period is desirable. By definition, deterministic optimal control software is such a function $\cdot$, that the functional $\Phi \overset{\text{def}}{=} \cdot, \cdot, \cdot$ takes the smallest value.Also by definition, stochastic optimal control is a function of $\cdot$, which minimizes the functional $\Psi \overset{\text{def}}{=} \cdot, \cdot, \cdot$, where $E$is the expectation operator.The question of the relationship between functionals$\Phi$and Ψ, for example, for the possibility of (appropriate) replacement of specific cases control function on function and vice versa.I t is shown that under certain quite general conditions relating to the stochastic properties of the process-difference and the possibility in the certain way approximate relationship between implementations (vector) process $\cdot, \cdot$ and coordinates of elements of the set $\cdot$ functional Ψ explicitly expressed in terms of Weber functions . Each of these functions is a solution of the Cauchy problem

$$'' \quad 1/2 \quad /4 \quad 0,$$
$$0 \quad 2^{/2}\sqrt{\ } \ \Gamma \ 1 \quad /2, \ ' \ 0 \quad 2^{/} \ \sqrt{2} \ \Gamma \quad /2,$$

where$\Gamma(\cdot)$ - Euler gamma function, and a set of indices $p$is determined by the parametric of the above-mentioned approximation.It is established that when the functions are replaced in the above representation by the main part of its asymptotic at minus infinity, the functional Ψ (stochastic control) turns into the functional Φ (deterministic control).The above statements generalize some results of [1,2] concerning certain specific systems.

References
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