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ON THE RELATIONSHIP BETWEEN SOME WAYS OF STOCHASTIC SYSTEMS PROGRAM CONTROL

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We call a system a stochastic system if it's states change (including) under the influence of random factor. Let α (*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 · , · , · , where · is control function, · 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 · , that the functional Φ ≝ · , · , · takes the smallest value.Also by definition, stochastic optimal control is a function of · , which minimizes the functional Ψ ≝ · , · , · , where *E*is the expectation operator.The question of the relationship between functionalsΦand 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 · , · and coordinates of elements of the set · functional Ψ explicitly expressed in terms of Weber functions . Each of these functions is a solution of the Cauchy problem

$$'' \quad 1/2 \quad /4 \quad 0,$$

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

whereΓ (·) - 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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