
Research algorithm of nonlinear systems of automatic control in stochastic conditions

© Chzho Tu Aung, D.V. Melnikov

Kaluga Branch of Bauman Moscow State Technical University, Kaluga, 248000, Russia

The main purpose of the article is to present the algorithm of studying the devices whose dynamics is described by stochastic nonlinear differential equations. The research method is based on replacing the stochastic task with the equivalent family of deterministic problems, obtained by the methods developed that allow us to accurately calculate probabilistic characteristics of random processes in control systems. The research algorithm is highly universal due to the fact that the original mathematical model of control systems describes almost all major classes of systems. The algorithm imposes no restrictions on the stationarity and the laws of distribution of random signals and random control system parameters; allows us to calculate not only the torque characteristics, but also the probabilities. The accuracy of calculating probability characteristics is determined by the number of samples of random variables, defined in a deterministic way.

Keywords: *stochastic system, random process, orthonormal basis, variance, correlation function, modeling.*

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Kyaw Thu Aung is a postgraduate of the Automatic Control Systems Department at Kaluga branch of Bauman Moscow State Technical University. Author of 4 scientific works in the field of energy, electrical engineering, modeling and control of engineering systems. Research interests include energy control systems.
e-mail: kyawthuaung310@gmail.com

Melnikov D.V. (b. 1975) graduated from Kaluga branch of Bauman Moscow State Technical University in 1998. Ph.D., Assoc. Professor, he is the Head of the Electrical Department at. Author of over 125 scientific papers in the field of energy, electrical engineering, modeling and control of engineering systems. His research interests include energy management system. e-mail: melnikov-dv@yandex.ru
