

**Rykov V. V., Kozyrev D. V.** (Moscow, Russia) **To problems of sensitivity of stochastic models.**

The system stability problem is a main problem of all natural sciences. For investigation of stochastic systems this problem often looks like a problem of system characteristics insensitivity to the shape of initial distributions of the model elements. Some investigations by B.A. Sevast'ianov, I.N. Kovalenko, B.V. Gnedenko, A.D. Solov'ev have been devoted to this problem.

In paper [1] the asymptotic insensitivity of reliability function for the heterogeneous renewable double redundant system, which components' failures are described by Marshall-Olkin model, to the shapes of their repair time has been considered. Its closed form in terms of Laplace transform has been found, which demonstrates its evident sensitivity to the shape of components' repair time distributions. For the case of rare failures of system's components an asymptotic insensitivity of the reliability function to the shape of their repair time distribution has been proved.

In current talk this investigation is prolonged and with the help of additional variable method the considered system is described by two-dimensional Markov process with discrete-continuous states space. For this process closed form representation for its micro- and macro-states stationary and quasi-stationary probabilities are calculated. Their asymptotic insensitivity to the shape of components' repair time distributions under their rare failures has been proved.

#### REFERENCES

1. *Dmitry Kozyrev, Vladimir Rykov, Nikolai Kolev.* Reliability Function of Renewable System under Marshall-Olkin Failure Model. Reliability: Theory and Applications. Vol. 13, No 1 (48) March 2018, pp.39-46.