Shumafov M. M., Tlyachev V. B. (Adyghe State University, Republic of Adygea, Russia) — **On the stability of solutions of certain systems of two nonlinear differential equations perturbed by white noise.**

In the present work, we derive sufficient conditions for globally asimptotically stochastically stability of the zero solution of certain systems of two nonlinear differential equations perturbed by white noise. Our results generalize the results of the paper [1] for stochastic case.

The systems considered are interpreted as systems of stochastic differential equations in the sense of Ito. Let us formulate one of our results.

Theorem. *Assume that in the system*

$$\dot{x} = ax + f(y) + \sigma(x)\dot{\xi}(t), \quad \dot{y} = g(x) + by, \tag{1}$$

the functions f, g and σ satisfy the Lipschitz condition, $g \in C^1$, a and b are constant, $\dot{\xi}(t)$ is white noise; $f(0) = g(0) = \sigma(0) = 0$.

Suppose there exist numbers $m > 0$ and $c_i > 0$ $(i = 1, 2)$ such that the following conditions hold:

1) $a < 0, \quad b < 0$,
2) $g(x)/x > c_1$ *for all* $x \neq 0$, $g'(x) < m$ *for all* x,
3) $yf(y) < 0$ *for all* $y \neq 0$,
4) $0 < \sigma(x)/x < c_2$ *for all* $x \neq 0$,
5) $mc_2^2 + 2ac_1 < 0$.

Then the zero solution of the system (1) *is globally asymptotically stochastically stable.*

REFERENCES

1. *Krasovskii, N. N.* On stability of solutions of a system of two differential equations. Prikl. Mat. and Meh., 1953, vol. 17, No. 6, pp. 651–672. (In Russian)