Zotova E. I. (UUST, Ufa, Russia). **On the method of solving the Cauchy problem for stochastic and deterministic generalized Burgers equations.** We study the Cauchy problem for the stochastic generalized Burgers equation with noise in the nonlinear part:

$$u(x,t) - u(x,0) + \int_0^t u_x(x,s) f'(u(x,s)) * dV(s) = \int_0^t u_{xx}(x,s)ds, \tag{1}$$
$$u(x,0) = \varphi(x), \quad (x,t) \in \mathbf{R} \times \mathbf{R}^+,$$

where the integral on the left-hand side of equality (1) is a symmetric integral [1] with respect to the process $V(t)$ with continuous realizations with probability 1. For $f(u) = \frac{u^2}{2}$ and $V(t) = t$ problem (1) is reduced to the Cauchy problem for the deterministic Burgers equation [2].

A new method for solving the Cauchy problem for the generalized Burgers equation is constructed.

Theorem. *Let the function $g(x,v)$ be determined from the relation*

$$g(x,v) = \varphi(x - vf'(g(x,v))), \quad (x,v) \in \mathbf{R} \times \mathbf{R}.$$

Then the function

$$u(x,t) = \frac{1}{2\sqrt{\pi t}} \int_{-\infty}^{\infty} g(\xi, V(t)) \exp\left\{\frac{-(x-\xi)^2}{4t}\right\} d\xi,$$

is a solution to the Cauchy problem for the stochastic generalized Burgers equation (1).

REFERENCES

[1] Nasyrov F.S., *Local times, symmetric integrals and stochastic analysis*, FIZMATLIT, Moscow, 2011. (in Russian)

[2] Hopf, E., *The partial differential equation $u_t + uu_x = u_{xx}$*, Comm. Pure and Appl. Math., Vol. 3, pp. 201–230, 1950.