Suchkova D. A. (Ufa, Russia) — **Construction of the solution of the stochastic long wave equation (BBM) with white noise dispersion.**

The deterministic BBM equation (Benjamin-Bona-Mahony)

$$u_t + u_x + uu_x - u_{xxt} = 0. \tag{1}$$

as an approximation for the description of unidirectional propagation of waves with small wave-amplitude and large wavelength in nonlinear dispersive systems has several advantages in comparison with the well-known Kordeweg & de Vries equation [1], in particular the phase velocitiy and group velocity corresponding to (1) are bounded for all wave numbers, moreover, both velocities approach zero for large wave numbers.

The stochastic BBM equation (regularized long wave equation with white noise dispersion)

$$du_t - du_{xx} + u_x * dW + uu_x dt = 0, \qquad u(s) = u_s \tag{2}$$

is more adequate model in the particular physical systems which are stochastic in nature. The introduction of white noise in the dispersion term justifies this numerically [2]. Earlier in [2] the existence and uniqueness of the solution of problem (2) was proved in a certain class of functions.

It is shown that in order to find a solution of problem (2) it is sufficient to know the solution of the original problem (1), then the solution (2) is a determinate function of the Wiener process [3].

Theorem *(on the structure of the solution). Let the function* $\phi(x,t)$ *be a solution of the deterministic BBM equation* (1)*, then the function* $u = -\phi(W(t)+x,t) - 1$ *is a solution of the problem* (2).

Using this method, the numerical simulation of the solution is performed.

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