Asylgareev A. S. (Ufa, Russia) — **On comparison of solutions of stochastic differential equations driven by multidimensional Wiener process.**

Consider two stochastic differential equations (hereinafter SDE) with Stratonovich integrals driven by multidimensional Wiener process $\overline{W}_t^{(n)} = \left(W_t^{(1)}, \dots, W_t^{(n)}\right)$ defined on the filtered probability space $(\Omega, F, (F_t)_{t\geqslant 0}, P)$.

$$d\xi_k^{(n)}(t) = \sum_{j=1}^{n} \sigma_{kj}^{(n)}\left(t, \xi_k^{(n)}(t)\right) * dW_t^{(j)} + b_k^{(n)}\left(t, \xi_k^{(n)}(t)\right) dt,\ k = 1, 2. \tag{1}$$

The purpose of this study, which continues the paper [1], is a proof of comparison theorems for the equations (1). The approach used here is based on the fact that solutions of (1) can be represented in the form

$$\xi_k^{(n)}(t) = \widehat{D}_k^{(n)}\left(t, W_t^{(n)} + D_k^{(n-1)}(t, \overline{W}_t^{(n-1)})\right),$$

where $\widehat{D}_k^{(n)}(t, u)$ are deterministic functions, and $\xi_k^{(n-1)}(t) = D_k^{(n-1)}(t, \overline{W}_t^{(n-1)})$ are solutions of SDE driven by $(n-1)$-dimensional Wiener process. Main result is the following theorem.

Theorem 1. *Suppose that for all* $t \geqslant 0,\ j = 1, \dots, n$ *we have*

(a) $\sigma_{2j}^{(j)}(t, v) > 0$ *for all* $v \in R$,

(b) $\widehat{D}_2^{(j)}(t, u) \geqslant \widehat{D}_1^{(j)}(t, u)$ *for all* $u \in R$,

(c) $D_2^{(0)}(t) \geqslant D_1^{(0)}(t)$ *with probability 1.*

Then $\xi_2^{(n)} \geqslant \xi_1^{(n)}$ *for all* $t \geqslant 0$ *a.s.*

REFERENCES

1. *Asylgareev A.S., Nasyrov F.S.* Theorems of comparison and stability with probability 1 for one-dimensional stochastic differential equations. — Siberian Mathematical Journal, 2016, vol. 57, № 5, pp. 754–761.