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ABSTRACTS OF TALKS GIVEN AT THE 8TH INTERNATIONAL CONFERENCE ON STOCHASTIC METHODS*

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The Eighth International Conference on Stochastic Methods (ICSM-8) was held June 1–8, 2023 in Divnomorskoe (near the town of Gelendzhik) at the Raduga sports and fitness center of the Don State Technical University, where the previous conference (ICSM-7) took place in 2022. ICSM-8 was organized by the Steklov Mathematical Institute of Russian Academy of Sciences (Steklov International Mathematical Center; Department of Theory of Probability and Mathematical Statistics); Lomonosov Moscow State University (Department of Probability Theory); National Committee of the Bernoulli Society of Mathematical Statistics, Probability Theory, Combinatorics, and Applications; and the Don State Technical University (Department of Higher Mathematics).

This conference was dedicated to the 120th birthday of the great Russian mathematician, academician *Andrei Nikolaevich Kolmogorov*. The conference opened with the address "On the 120th Anniversary of the Birth of A. N. Kolmogorov" by A. N. Shiryaev, who spoke in detail about Kolmogorov's life and work, which predetermined the development of the theory of probability and other mathematical disciplines. Many reports at the conference began with remembrances of A. N. Kolmogorov and descriptions of the various results he obtained. A video of the reports was made and subsequently posted on the conference website, https://www.intconfstochmet.ru. On the final day of the conference, a film was presented about the house at Komarovka, where academicians A.N. Kolmogorov and P. S. Aleksandrov lived for many years and obtained many outstanding results.

Many leading scientists from Russia, Portugal, and Tajikistan took part in ICSM-8. Russian participants came from Moscow, St. Petersburg, Rostov-on-Don, Voronezh, Sevastopol, Tomsk, Ufa, Nizhnii Novgorod, Khabarovsk, Chelyabinsk, Sochi, Taganrog, Maikop, Belgorod, Veliky Novgorod, and Kaluga. A special section for postgraduate, graduate, and undergraduate students was held. Twenty-six talks were given at joint sessions, and 37 talks were presented at parallel sessions.

The talk on the Vega Institute Science Promotion Foundation, which implements joint educational projects with the department of probability at Lomonosov Moscow University, was given by K. Yu. Klimov and M. N. Tsareva, Vega Foundation representatives. The talk "V.R. Kolmogorov: New Formats for Popularization of Mathematics" was presented by I. V. Grigaliuniene (Skolkovo Institute of Science and Technology).

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THEOREM. *If the operator* $H(\omega) := \varkappa\Delta + V(x,\omega)$ *satisfies the condition* $\Lambda \geqslant \sqrt{2\varkappa+1} - 1$, *then, for any realization of the environment* ω, *there exists an isolated positive eigenvalue* $\lambda(\omega)$ *of the operator* $H(\omega)$. *In addition, if this condition is met, then, for any realization of the environment* ω, *the eigenvalue* $\lambda(\omega)$ *lies in the interval* $\bigl[\sqrt{(\Lambda+1)^2+\varkappa^2} - (\varkappa+1), \sqrt{\Lambda^2+\varkappa^2} - \varkappa\bigr]$.

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[1] F. DEN HOLLANDER, S. A. MOLCHANOV, AND O. ZEITOUNI, *Random Media at Saint-Flour*, Probab. St.-Flour, Springer, Heidelberg, 2012.

D. F. Kuznetsov (Peter the Great Saint-Petersburg Polytechnic University, Russia). **Recent results on a new approach to series expansion of iterated Stratonovich stochastic integrals with respect to components of a multidimensional Wiener process.**

THEOREM 1 (see [1, sections 1.11, 2.1.4, 2.10–2.18]). *Let a complete orthonormal system* $\{\phi_j(x)\}_{j=0}^{\infty}$ *in* $L_2[t,T]$ $(\phi_0(x) = 1/\sqrt{T-t})$ *and functions* $\psi_1(\tau),\dots,\psi_k(\tau) \in C[t,T]$ *satisfy the condition* (2.702) *from* [1, *section* 2.10)]. *Then*

$$\int_t^T \psi_k(t_k)\cdots \int_t^{t_2} \psi_1(t_1) \circ d\mathbf{W}_{t_1}^{(i_1)} \cdots \circ d\mathbf{W}_{t_k}^{(i_k)} = \underset{p_1,\dots,p_k\to\infty}{\text{l.i.m.}} \sum_{j_1=0}^{p_1} \cdots \sum_{j_k=0}^{p_k} C_{j_k\dots j_1} \zeta_{j_1}^{(i_1)} \cdots \zeta_{j_k}^{(i_k)}, \tag{1}$$

where $\zeta_j^{(i)} = \int_t^T \phi_j(\tau)\,d\mathbf{W}_\tau^{(i)}$ *are i.i.d.* $N(0,1)$ *r.v.'s* $(i \neq 0)$; $k \in \mathbf{N}$; $d\mathbf{W}_\tau^{(i)}$ *and* $\circ\, d\mathbf{W}_\tau^{(i)}$ *are the Itô and Stratonovich differentials, respectively*; $C_{j_k\dots j_1}$ *is the Fourier coefficient corresponding to the kernels* $K(t_1,\dots,t_k) = \psi_1(t_1)\cdots\psi_k(t_k)1_{\{t_1<\dots<t_k\}}$ $(k \geqslant 2)$ *and* $K(t_1) = \psi_1(t_1)$, $t_1,\dots,t_k \in [t,T]$, $i_1,\dots,i_k = 0,1,\dots,m$; $\mathbf{W}_\tau^{(i)}$ $(i = 1,\dots,m)$ *are independent standard Wiener processes*; *and* $\mathbf{W}_\tau^{(0)} = \tau$. *In addition, if* $\{\phi_j(x)\}_{j=0}^{\infty}$ *is a complete orthonormal system of either Legendre polynomials or trigonometric functions in* $L_2[t,T]$, *and if* $\psi_1(\tau),\dots,\psi_k(\tau) \in C^1[t,T]$, *then expansion* (1) *holds for* $k = 1,\dots,6$ $(p_1 = \dots = p_k = p$ *for* $k = 4,5,6)$ *also without the condition* (2.702) *from* [1, *section* 2.10].

Theorem 1 can be used for constructing high-order strong numerical methods for systems of Itô SDEs with noncommutative noise.

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[1] D. F. KUZNETSOV, *Strong Approximation of Iterated Itô and Stratonovich Stochastic Integrals Based on Generalized Multiple Fourier Series: Application to Numerical Solution of Itô SDEs and Semilinear SPDEs*, preprint, https://arxiv.org/abs/2003.14184v46, 2023.

K. S. Kuznetsov (Peter the Great Saint-Petersburg Polytechnic University, Russia). **Price of European options in the model of diagonal processes setting of the Wiener–Ornstein–Uhlenbeck field.**

Let the price of the underlying asset follow the SDE $dx_t = \mu x_t\,dt + \sigma x_t\,dZ_t$, $x_0 > 0$, $\mu \in \mathbf{R}$, $\sigma > 0$. The process Z_t is a "diagonal" process (for $s = t$) given