Dmitriy F. Kuznetsov (Peter the Great St.-Petersburg Polytechnic University, St.-Petersburg, Russia). **New Representations of the Hu–Meyer Formulas for the Case of a Multidimensional Wiener Process.**

Theorem 1 [1] (P. 914, 917). *Let* $\Phi(t_1,\ldots,t_k)\in L_2([t,T]^k)$, $\{\phi_j(x)\}_{j=0}^{\infty}$ *is an arbitrary CONS in* $L_2[t,T]$, *and condition* [1] (P. 913) *is fulfilled. Then for all* $k\in\mathbf{N}$ *and* $i_1,\ldots,i_k=0,1,\ldots,m$

$$J^S[\Phi]_{T,t}^{(i_1\ldots i_k)}=J'[\Phi]_{T,t}^{(i_1\ldots i_k)}+$$
$$+\sum_{r=1}^{[k/2]}\sum\nolimits'\prod_{s=1}^{r}\mathbf{1}_{\{i_{g_{2s-1}}=\,i_{g_{2s}}\ne 0\}}J'\Bigl[T^{k-2r}_{g_1,g_2\ldots,g_{2r-1},g_{2r}}\Phi\Bigr]_{T,t}^{(i_{q_1}\ldots i_{q_{k-2r}})}\qquad w.\ p.\ 1.$$

If, in addition, conditions [1] (P. 916) *are satisfied, then*

$$J'[\Phi]_{T,t}^{(i_1\ldots i_k)}=J^S[\Phi]_{T,t}^{(i_1\ldots i_k)}+$$
$$+\sum_{r=1}^{[k/2]}(-1)^r\sum\nolimits'\prod_{s=1}^{r}\mathbf{1}_{\{i_{g_{2s-1}}=\,i_{g_{2s}}\ne 0\}}J^S\Bigl[\tilde{T}^{k-2r}_{g_1,g_2\ldots,g_{2r-1},g_{2r}}\Phi\Bigr]_{T,t}^{(i_{q_1}\ldots i_{q_{k-2r}})}\qquad w.\ p.\ 1,$$

where $[x]$ *is an integer part of* x, $J^S[\Phi]_{T,t}^{(i_1\ldots i_k)}$ *is the multiple Stratonovich integral* [1] (P. 912), $J'[\Phi]_{T,t}^{(i_1\ldots i_k)}$ *is the multiple Wiener integral* [1] (P. 211), $T^{k-2r}_{g_1,g_2\ldots,g_{2r-1},g_{2r}}\Phi$, $\tilde{T}^{k-2r}_{g_1,g_2\ldots,g_{2r-1},g_{2r}}\Phi$ are rth limiting traces of Φ [1] (P. 911, 915), $\sum'$ is the sum with respect to all permutations of the set $(\{\{g_1,g_2\},\ldots,\{g_{2r-1},g_{2r}\}\},\{q_1,\ldots,q_{k-2r}\})$, $\{g_1,g_2,\ldots,g_{2r-1},g_{2r},q_1,\ldots,\ q_{k-2r}\}=\{1,2,\ldots,k\}$, $\{\cdot\}$ — unordered set, $(\cdot)$ — ordered set, $\prod_{\emptyset}\stackrel{\mathsf{def}}{=}1$, $\sum_{\emptyset}\stackrel{\mathsf{def}}{=}0$, $\mathbf{1}_A$ is the indicator of A.

Theorem 1 presents analogues of Theorems 5.1, 6.1 from [2] for the case of a multidimensional Wiener process.

СПИСОК ЛИТЕРАТУРЫ

[1] D.F. Kuznetsov, https://arxiv.org/abs/2003.14184 (v74 — 2026).

[2] Johnson, G.W., Kallianpur, G. Homogeneous chaos, p-forms, scaling and the Feynman integral. Trans. Amer. Math. Soc., 340 (1993), 503-548.