CORRIGENDUM AND ADDENDUM TO ”CHAOS EXPANSION METHODS IN MALLIAVIN CALCULUS: A SURVEY OF RECENT RESULTS”

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The estimate $\alpha! \leq (2N)^\alpha$ on page 51 in [1], as well as the inclusions $(S)_{-1,-(p-1)} \subseteq (S)_{0,-p}$ and $(S)_{0,p} \subseteq (S)_{1,p}$, $p \in \mathbb{N}$, are not correct. The correct inclusions are: $(S)_{1,p} \subseteq (S)_{0,p}$ and $(S)_{0,-p} \subseteq (S)_{-1,-p}$, $p \in \mathbb{N}_0$.

Consequently, the statement and proof of Theorem 6.5 will hold only for the Hida spaces but not for the Kondratiev spaces. For this purpose we note that we may define $\text{Dom}_{0,-p}(\mathbb{D}) = \{ u \in X \otimes (S)_{0,-p} : \sum_{\alpha \in I} \| u_\alpha \|_X^2 |\alpha|! (2N)^{-p\alpha} < \infty \}$, and by the proof of Theorem 2.19 [1], $\mathbb{D} : \text{Dom}_{0,-p}(\mathbb{D}) \rightarrow X \otimes S_{-l}(\mathbb{R}) \otimes (S)_{0,-p}$, $l > p + 1$. Similarly, we define $\text{Dom}_{0,-l,-q}(\delta) = \{ u \in X \otimes S_{-l}(\mathbb{R}) \otimes (S)_{0,-q} : \sum_{\alpha \in I} \sum_{k=1}^{\infty} \| u_{\alpha,k} \|^2_X \alpha!(\alpha_k+1)(2k)^{-q(k-q)} < \infty \}$ and by the proof of Theorem 2.22 [1], $\delta : \text{Dom}_{0,-l,-q}(\delta) \rightarrow X \otimes (S)_{0,-q}$, $q > l + 1$, $l \in \mathbb{N}$.

The statement and proof of Theorem 6.5 on page 86 now have to be modified as follows.

**Theorem 6.5.** (Weak duality) Let $F \in \text{Dom}_{0,-p}(\mathbb{D})$ and $u \in \text{Dom}_{0,-q}(\mathbb{D})$ for $p, q \in \mathbb{N}$. For any $\varphi \in S_{-n}(\mathbb{R})$, $n < q - 1$, it holds that

$$\langle DF, \varphi \rangle_{-r} u \gg_{-r} = \langle F, \delta(\varphi) \rangle_{-r},$$

for $r > \max\{p, q + 1\}$.

**Proof.** Let $F = \sum_{\alpha \in I} f_\alpha H_\alpha \in \text{Dom}_{0,-p}(\mathbb{D})$, $u = \sum_{\alpha \in I} u_\alpha H_\alpha \in \text{Dom}_{0,-q}(\mathbb{D})$ and $\varphi = \sum_{k \in \mathbb{N}} \varphi_k k^k \in S_{-n}(\mathbb{R})$. Then, for $k > p + 1$, $DF \in X \otimes S_{-k}(\mathbb{R}) \otimes (S)_{0,-p} \subseteq X \otimes S_{-r}(\mathbb{R}) \otimes (S)_{0,-r}$ if $r > p + 1$. Also, one can easily check that $\varphi u \in \text{Dom}_{0,-n,-q}(\delta)$ and since $q > n + 1$, this implies that $\delta(\varphi u) \in X \otimes (S)_{0,-q} \subseteq X \otimes (S)_{0,-r}$, for $r \geq q$. Therefore we let $r > \max\{p + 1, q\}$. The rest of the proof is conducted as in [1].

**References**


http://www.dmi.uns.ac.rs/nsjom/Papers/45_1/NSJOM_45_1_045_103.pdf