The Annals of Applied Probability
2017, Vol. 27, No. 2, 1294–1295
DOI: 10.1214/16-AAP1224

CORRIGENDUM

WEAK APPROXIMATIONS FOR WIENER FUNCTIONALS [*Ann. Appl. Probab.* (2013) 23 1660–1691]

BY DORIVAL LEÃO AND ALBERTO OHASHI

Universidade de São Paulo and Universidade Federal da Paraíba

Unfortunately, the proofs of Theorem 3.1 and Corollary 4.1 in our paper [1] are incomplete. The reason is a wrong statement in Remark 2.2 in [1]. Hence, the arguments given in the proofs of Theorem 3.1 and Corollary 4.1 have to be modified. The hypotheses and statements of Theorem 3.1 and Corollary 4.1 in [1] remain unchanged. In the sequel, the notation of [1] is employed. The correct proofs of Theorem 3.1 and Corollary 4.1 in [1] are immediate consequences of the following result, whose proof is given in the arXiv manuscript [2].

LEMMA 1. *Let $\delta^k X = M^{k,X} + N^{k,X}$ be the canonical semimartingale decomposition for a Brownian martingale $X \in \mathbf{H}^2$. Then*

$$M^{k,X} \to X \tag{0.1}$$

weakly in $\mathbf{B}^2$ over $[0, T]$ as $k \to \infty$. Moreover, $\langle X, B\rangle^\delta = [X, B]\ \forall X \in \mathbf{H}^2$.

New proof of Theorem 3.1 in [1]. Let us define $N^X := X - X_0 - M^X$. We claim that $\langle N^X, B\rangle^\delta = 0$. Indeed, $[\delta^k N^X, A^k] = [M^{k,X} - \delta^k M^X, A^k]$. Proposition 3.2 in [1] yields $[M^{k,X}, A^k]_t \to [M^X, B]_t$ weakly in $L^1(\mathbb{P})$ for each $t \in [0, T]$. By noticing that $[\delta^k M^X, A^k] = [M^{k,M^X}, A^k]_t; 0 \le t \le T$, we shall apply Lemma 1 above to state that $\lim_{k\to\infty}[\delta^k M^X, A^k]_t = [M^X, B]_t$ weakly in $L^1(\mathbb{P})$ for every $t \in [0, T]$. Hence, $\langle N^X, B\rangle^\delta = 0$. The uniqueness of the decomposition is now just a simple consequence of the martingale representation of the Brownian motion.

New proof of Corollary 4.1 in [1]. On one hand, Lemma 1 yields $\langle X, B\rangle^\delta = [X, B]$ for every $X \in \mathbf{H}^2$. On the other hand, Theorem 4.1 in [1] yields $X_t = \int_0^t \mathcal{D}X_s\, dB_s; 0 \le t \le T$. Representation (4.9) in [1] is then a simple consequence of the definition of $\mathcal{D}^k X$.

REFERENCES

[1] LEÃO, D. and OHASHI, A. (2013). Weak approximations for Wiener functionals. *Ann. Appl. Probab.* **23** 1660–1691. MR3098445

Received August 2015.

[2] LEÃO, D. and OHASHI, A. (2013). Corrigendum to "Weak approximations for Wiener functionals." [*Ann. Appl. Probab.* **23** 1660–1691]. Available at arXiv:1508.07317.

DEPARTAMENTO DE MATEMÁTICA APLICADA
E ESTATÍSTICA
UNIVERSIDADE DE SÃO PAULO
13560-970, SÃO CARLOS—SÃO PAULO
BRAZIL
E-MAIL: leao@icmc.usp.br

DEPARTAMENTO DE MATEMÁTICA
UNIVERSIDADE FEDERAL DA PARAÍBA
13560-970, JOÃO PESSOA—PARAÍBA
BRAZIL
E-MAIL: alberto.ohashi@pq.cnpq.br
ohashi@mat.ufpb.br