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ERRATUM TO "THE SUPREMUM OF BROWNIAN LOCAL TIMES ON HÖLDER CURVES" ☆

ERRATUM POUR "LE SUPREMUM DU TEMPS LOCAUX D'UN MOUVEMENT BROWNIEN SUR LES COURBES HOLDERIENNES"

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Lemma 3.1 of [1] is incorrectly applied in Proposition 3.2. A corrected version of [1] is available online as [2]. The differences between [2] and [1] are in Theorem 1.2, Lemma 3.1, Propositions 3.2 and 3.3, and Theorem 3.6. The main difference is that the finiteness of the supremum in Theorem 1.2 requires the assumption $\alpha > 5/6$. This is a stronger assumption than $\alpha > 1/2$ which appeared in [1]. Heuristic arguments suggest that the original version of Theorem 1.2 is true, but at this time we do not have a rigorous argument to back up this claim. We would like to thank Alice Vatamanelu for pointing out the mistake.

We give some of the details here. Theorem 1.2 must be replaced by

THEOREM 1.2′. – *The supremum of $f \to L_1^f$ over $\mathcal{S}_\alpha$ is finite if $\alpha > \frac{5}{6}$ and infinite if $\alpha < \frac{1}{2}$.*

The statement of Theorem 3.6 must be changed in the corresponding way.

In Lemma 3.1 we must allow $|b - a|$ to be as large as $2N^{-\alpha/2}$. The statement of Lemma 3.1 becomes

LEMMA 3.1′. – *There exist c_1 and c_2 such that for all $\lambda > 0$*

$$\mathbb{P}\big(A_k > \lambda\sqrt{k}N^{(1-\alpha)/2}\big) \leqslant c_1 \mathrm{e}^{-c_2\lambda}.$$

The proof is entirely analogous to the previous one.

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In the statement of Proposition 3.2(ii), the exponent becomes $(5/4) - (\alpha/2) + (\varepsilon/2)$. In the proof we let

$$C_{ik} = C_{ik}(N) = \{A_{ik} \geqslant K^{(1/2)+\varepsilon} N^{(1-\alpha)/2}\}.$$

The second display on p. 634, near the middle of the page, becomes

$$3(K+1)3K^{\frac{3}{2}-\alpha+\varepsilon} \leqslant c_9 N^{\frac{5}{4}-\frac{\alpha}{2}+\frac{\varepsilon}{2}}.$$

In the statement of Proposition 3.3(ii) the exponent now becomes $(3/2) - \alpha + \delta$. The first display on p. 635 is now

$$c_4\left(\sqrt{N}\right)^{\frac{5}{4}-\frac{\alpha}{2}+\varepsilon}\left(\sqrt{N}\right)^{\frac{3}{2}-\alpha+\varepsilon} = c_4 N^{\frac{11}{8}-\frac{3\alpha}{4}+\varepsilon},$$

and the other exponents must also be changed suitably.

The exponent $\frac{3}{2} - \alpha + \delta$ must be compared with the exponent $\frac{1}{4} - \frac{\alpha}{2} + 2\varepsilon$ in (3.5). By taking ε sufficiently small, the bound in (3.5) will be summable provided $\alpha > \frac{5}{6}$.

REFERENCES

[1] R.F. Bass, K. Burdzy, The supremum of local times on Hölder curves, Ann. Inst. Henri Poincaré 37 (2001) 627–642.

[2] R.F. Bass, K. Burdzy, The supremum of local times on Hölder curves, Corrected May 21, 2002. http://www.mathpreprints.com/math/Preprint/burdzy/20020521/2/; http://www.math.washington.edu/~burdzy/preprints.shtml.