Corrigendum on Z.-Q. Chen, P. Kim, and T. Kumagai: Global heat kernel estimates for symmetric jump processes. *Trans. Amer. Math. Soc.*, 363(9), 5021–5055, 2011.

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In the statement of Theorem 1.2(2.b) and Theorem 1.4 of [2], the following corrections should be made for the large time estimates:

(i) page 5025, Eq (1.17) : $|\log \frac{|x-y|}{t}|$ should be $(1+\log^+ \frac{|x-y|}{t})$ (two places).

(ii) page 5027, Eq (1.21) : $\log \frac{|x-y|}{t}$ should be $(1+\log^+ \frac{|x-y|}{t})$ (two places).

Similarly,

(iii) page 5039, line 13 and page 5040, line 6: $(|x-y|\log(|x-y|/t) \wedge |x-y|^2/t)$ should be $\Big(|x-y|(1+\log^+ \frac{|x-y|}{t})\Big) \wedge \big(|x-y|^2/t\big)$.

(iv) page 5039, line -4: $\Big(|x-y|(\log \frac{|x-y|}{t})^{(\beta_0-1)/\beta_0} \wedge |x-y|^2/t\Big)$ should be $\Big(|x-y|(1+\log^+ \frac{|x-y|}{t})^{(\beta_0-1)/\beta_0}\Big) \wedge \big(|x-y|^2/t\big)$.

This is because in the proof of [2, Theorems 1.2(2.b)], the case of $|x-y| \asymp t$ when $\beta \in (1,\infty)$ was missed to be considered. Once taking into account of this missing case, one can easily conclude from [2] that $1+\log^+ \frac{|x-y|}{t}$ is the correct term. See [1, Proposition 6.7] for a proof of the lower bound estimate on the Dirichlet heat kernel in upper half space, which has this corrected term .

We take this opportunity to correct some typos in the paper and update a reference.

1. page 5022, line -5: "and" should be "which in particular implies that"

2. page 5024, Eq (1.15) and page 5026, Eq (1.19): the second C^{-1} should be C.

3. page 5028, line 4: Delete the last dw.

4. page 5028, line 12: Delete the last dz.

5. page 5029, line 1: β_3 should be β_*, say. (β_3 is used in (3.10).)

6. page 5031, Eq (3.7): $\|f\|_2$ should be $\|f\|_2^2$

7. page 5033, line -12: "$|\xi - \eta| \le t/C_*$" should be "$|x-y| \le t/C_*$".

8. page 5035, line -2: "$\lambda > 0$" should be "$\lambda \ge b$".

9. page 5036–5039, proof of Theorem 3.4: All β_3 in the proof of Theorem 3.4 should be β_1 except two β_3's in (3.34) and one β_3 in the denominator of second term in page 5039 line 5, which comes from the upper bound of J_λ.

10. page 5037, line 1: "where the lower bound of (3.10)" should be "where the upper bound of (3.10)".

11. Page 5037, line 8: β_8 should be β_1.

12. Page 5037, line -13, -14: Change "Let $b := \frac{a\beta_3}{8(d+\beta_3)C^*}$ and note that $\phi_1^{-1}(t) \le c_1\phi_2^{-1}(t)$ for $t \le 1$ due to (3.12). By (3.10) and (3.25)," to "Let $b := \frac{a\beta_3}{8(d+\beta_3)C^*}$. By (3.25),"

13. Page 5039, line 1: (3.34) should be (3.36).

14. page 5040, line -2: c_2 should be c_1.

15. page 5041, line -12: "$(\mathcal{E}, \mathcal{F})$ ..." should be "$(\mathcal{Q}, \mathcal{D})$ ...".

16. page 5042, Eq (4.3): $q^\delta(t,x,y) \le c_\delta t^{-d/2}$ should be $q^\delta(t,x,y) \le c_\delta(\phi_2^{-1}(t)^{-d} \vee t^{-d/2})$

17. page 5042, Eq (4.4): $e^{-s\|\mathcal{J}_\delta\|_\infty}$ should be $e^{-t\|\mathcal{J}_\delta\|_\infty}$.

18. page 5042, line -11: $|x|$ and $|y|$ should be $|x-x_0|$ and $|y-x_0|$, respectively.

19. page 5042, Eq (4.5): $|x|$ should be $|x-x_0|$.

20. page 5042, line -4: $q^{\delta,B(x_0,r)}(t,x,y_0)$ should be $q^{\delta,B(x_0,r)}(t,\cdot,y_0)$.

21. page 5043, Theorem 4.6: Delete "for every $x_0 \in \mathbb{R}^d$" from the 2nd line of Theorem 4.6.

22. page 5043, line -15: $\varphi_r(\cdot)$ should be $\Phi_r(\cdot)$.

23. page 5043, Eq (4.8): $L^2(u,u)$ should be $L^2(\mathbb{R}^d;dx)$.

24. page 5044, line 13: $r^{d+2}J(rx,ry)$ should be t $r^{d+2}\widehat{J}_\delta(rx,ry)$.

25. page 5044, line -10: $(\log|w|/(r^2t))^{(\beta_0-1)/\beta_0}$ should be $(1+\log|w|/(r^2t))^{(\beta_0-1)/\beta_0}$

26. page 5044, Eq (4.12): Change $|w|_0^\beta$ to $|w|^{\beta_0}$.

27. page 5044, Eq (4.13): The first 1/4 should be 1/2.

28. page 5045, line 3–4: Change

$$G'(t) = -\int_B\int_B ...\, dxdy - \int_B ...\, dx$$

to

$$G'(t) = -c_5^{-1}\int_B\int_B ...\, dxdy - c_5^{-1}\int_B ...\, dx.$$

29. page 5045, line 13 and page 5045, line -9: $J^{(r)}(x,y)$ should be $\widehat{J}^{(r)}(x,y)$.

30. page 5045, line -14: β_2 should be β_3.

31. page 5048, Eq (4.19): "$z \in B_{3aR/2}$." should be " $z \in B_{3aR/2} \setminus B_{5aR/4}$."

32. page 5049, line -4: "$e^{-c_2|z-x|(\log|z-x|/t)^{(\beta-1)/\beta}}$" should be "$t^{-d/2}e^{-c_2|z-x|(1+\log^+(|z-x|/t))^{(\beta-1)/\beta}}$".

33. page 5050, line 3: "$te^{-c_8|z-x|^\beta}$" should be "$t^{-d/2}e^{-c_8|z-x|^\beta}$".

34. page 5050, Eq (5.2): $B(x,r)$ should be $B(x,r/4)$

35. page 5050, line 12: $\mathbb{P}_x\left(\tau_{B(x,2r)} < \gamma r^2\right) = \mathbb{P}_x\left(\sup_{u\le\gamma r^2}|Y_u - Y_0| > r\right)$ should be $\mathbb{P}_x\left(\tau_{B(x,r/2)} < \gamma r^2\right) = \mathbb{P}_x\left(\sup_{u\le\gamma r^2}|Y_u - Y_0| > r/2\right)$.

36. page 5050, line 13: $t = 4\gamma r^2$ should be $t = \gamma r^2$.

37. page 5051, line -2: $|x - y|$ should be $|x - y|^\beta$.

38. page 5055, Reference [20]: Ann. Inst. H. Poincaré Probab. Statist. **47(3)** (2011), 650–662.

References

[1] Z.-Q. Chen, P. Kim, Global Dirichlet Heat Kernel Estimates for Symmetric Lévy Processes in Half-space, arXiv:1504.04673.

[2] Z.-Q. Chen, P. Kim, and T. Kumagai. Global heat kernel estimates for symmetric jump processes. *Trans. Amer. Math. Soc.*, 363(9):5021–5055, 2011.

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