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CORRIGENDUM

Non-standard real-analytic realizations of some rotations of the circle – CORRIGENDUM

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Abstract. We correct two technical errors in the original paper. The main result in the original paper remains valid without any changes.

We would like to correct two errors in [**1**], the first of which was repeated in [**2**].

(i) The complexification of the function $s_{\alpha,N}$ used to approximate the 'step' function $\tilde{s}_{\alpha,N}$ defined in the proof of Lemma 4.7 need not converge. Instead one can use either a Fourier series approximation or the following function (suggested by Philipp Kunde) with the additional assumption that k is even:

$$s_{\alpha,N}(x) := \left(\sum_{i=0}^{k/2-1} \alpha_i \left(e^{-e^{-A\sin(2\pi(Nx-i/k))}} - e^{-e^{-A\sin(2\pi(Nx-(i+1)/k))}}\right)\right) e^{-e^{-A\sin(2\pi Nx)}} + \left(\sum_{i=k/2}^{k-1} \alpha_i \left(e^{-e^{-A\sin(2\pi(Nx-i/k))}} - e^{-e^{-A\sin(2\pi(Nx-(i+1)/k))}}\right)\right) e^{-e^{A\sin(2\pi Nx)}}. \quad (0.1)$$

Note that in addition to all the requirements of Lemma 4.7, the function $s_{\alpha,N}$ in (0.1) satisfies the derivative condition $\sup_{x\in[0,1)\setminus F} |s'_{\alpha,N}(x)| < \varepsilon$ required in [**2**].

(ii) Proposition 5.1 claims more than what we can prove. It should be replaced by the following version.

PROPOSITION 5.1. *Fix any $\rho > 0$. Then, for an appropriately chosen sequence k_n, we have $T_n \to T$ for some $T \in \mathrm{Diff}^{\omega}_{\rho}(\mathbb{T}^2)$. (We cannot guarantee that the complexification of the lift (to $\mathbb{R}^2$) of T can be holomorphically extended to the whole of $\mathbb{C}^2$, but it is easy to see that it extends to a fixed strip in $\mathbb{C}^2$ containing $\mathbb{R}^2$.)*

Proof. Let $\varepsilon > 0$ and let ε_n be a sequence such that $\sum_{n=1}^{\infty} \varepsilon_n < \varepsilon$. Now notice that with d_ρ denoting the usual distance in $\mathrm{Diff}^{\omega}_{\rho}(\mathbb{T}^2)$, we have $d_\rho(T_{n+1}, T_n) = d_\rho(H_{n+1}^{-1} \circ \phi^{\alpha_{n+1}} \circ H_{n+1}, H_n^{-1} \circ \phi^{\alpha_n} \circ H_n) = d_\rho(H_{n+1}^{-1} \circ \phi^{\alpha_n} \circ \phi^{1/k_n l_n^2 q_n} \circ H_{n+1}, H_n^{-1} \circ \phi^{\alpha_n} \circ H_n)$ $= d_\rho(H_n^{-1} \circ \phi^{\alpha_n} \circ h_{n+1}^{-1} \circ \phi^{1/k_n l_n^2 q_n} \circ H_{n+1}, H_n^{-1} \circ \phi^{\alpha_n} \circ H_n) < \varepsilon_n$. The last step is guaranteed after choosing a large enough k_n. This is possible because the construction of h_{n+1} does not involve k_n. So, we are free to make it as large as we want. □

REFERENCES

[**1**] S. Banerjee. Non-standard real-analytic realizations of some rotations of the circle. *Ergod. Th. & Dynam. Sys.*, doi:10.1017/etds.2015.110.

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