Corrigendum: Semiclassical Limit of Quantum Dynamics with Rough Potentials and Well-Posedness of Transport Equations with Measure Initial Data

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We would like to correct a few minor mistakes in [2], kindly pointed out to us by Vivek Tewary. In Proposition 2.1 the assumption (ii), involving an L^1 bound on the time derivative, has to be replaced by an L^q bound with $q > 1$, namely:

(ii) Time Tightness. There exists $q > 1$ such that, for all $\phi \in C_c^\infty(\mathbb{R}^d)$ and $n \geq 1$, the map $t \mapsto \int_{\mathbb{R}^d} \phi \, d\omega(t)$ is absolutely continuous in $[0, T]$ for η_n-a.e. ω and

$$\lim_{M \uparrow \infty} \sup_n \eta_n \left(\left\{ \omega : \int_0^T \left| \left(\int_{\mathbb{R}^d} \phi \, d\omega(t) \right)' \right|^q \, dt > M \right\} \right) = 0.$$

Accordingly, in Theorem 5.2, assumption (iv) has to be modified as follows:

(iv) Time Tightness. There exists $q > 1$ such that, for $\mathbb{P}$-a.e. $w \in W$, for all $\phi \in C_c^\infty(\mathbb{R}^d)$ and $n \geq 1$, the map $t \mapsto \int_{\mathbb{R}^d} \phi \, d\mu_n(t, i_n(w))$ is absolutely continuous in $[0, T]$ and, uniformly in n,

$$\lim_{M \uparrow \infty} \mathbb{P} \left(\left\{ w \in W : \int_0^T \left| \left(\int_{\mathbb{R}^d} \phi \, d\mu_n(t, i_n(w)) \right)' \right|^q \, dt > M \right\} \right) = 0.$$

This also applies to [1, theorem 2.3(iv)], where the results of [2] were announced.

The main results of the paper and their proofs (see, for instance, the proof of Theorem 9.1), are not affected by these replacements, since uniform estimates in time of the derivative of $\int \phi \, d\omega(t)$ are available.

Finally, statement (i) of Proposition 3.10 is incorrect and should be disregarded. However, only statement (ii) of the proposition is actually used, in the proof of Theorem 4.4.

Bibliography

[1] Ambrosio, L.; Figalli, A. Almost everywhere well-posedness of continuity equations with measure initial data. *C. R. Math. Acad. Sci. Paris* **348** (2010), no. 5-6, 249–252. doi:10.1016/j.crma.2010.01.018

[2] Ambrosio, L.; Figalli, A.; Friesecke, G.; Giannoulis, J.; Paul, T. Semiclassical limit of quantum dynamics with rough potentials and well-posedness of transport equations with measure initial data. *Comm. Pure Appl. Math.* **64** (2011), no. 9, 1199–1242. doi:10.1002/cpa.20371

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