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Corrigendum

Corrigendum to "Schrödinger equation and the oscillatory semigroup for the Hermite operator" [J. Funct. Anal. 224 (2005) 371–385]

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This is to point out and fill up a gap in the proof of Proposition 3.2 in the above paper by us. In the step of the proof, instead of proving

$$\left\| \int_{\mathbb{S}^1} e^{i(t-s)H} h_\varepsilon(\cdot, s)\, ds \right\|_{L^q(\mathbb{S}^1; L^p(\mathbb{R}^n))} \leqslant C_n \left\| h(\cdot,\cdot) \right\|_{L^{q'}(\mathbb{S}^1; L^{p'}(\mathbb{R}^n))}, \tag{0.1}$$

we only showed that

$$\left\| \int_{\mathbb{S}^1} e^{i(t-s)H} h_\varepsilon(\cdot, s)\, ds \right\|_{L^{q'}(\mathbb{S}^1; L^p(\mathbb{R}^n))} \leqslant \left\| h(\cdot,\cdot) \right\|_{L^{q'}(\mathbb{S}^1; L^{p'}(\mathbb{R}^n))}. \tag{0.2}$$

However, (0.1) can be obtained from (0.2) with one more step: Since

$$\left\| \int_{\mathbb{S}^1} e^{i(t-s)H} h_\varepsilon(\cdot, s)\, ds \right\|^q_{L^q(\mathbb{S}^1; L^p(\mathbb{R}^n))} = \int_{\mathbb{S}^1} \left\| \int_{\mathbb{S}^1} e^{i(t-s)H} h_\varepsilon(\cdot, s)\, ds \right\|^q_{L^p(\mathbb{R}^n)} dt,$$

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an application of Hölder's inequality with index q'/q shows that RHS is at most

$$(2\pi)^{\frac{q'-q}{q'}} \left\| \int_{\mathbb{S}^1} e^{i(t-s)H} h_\varepsilon(\cdot, s)\, ds \right\|^q_{L^{q'}(\mathbb{S}^1; L^p(\mathbb{R}^n))}.$$

This gives (0.1) in view of (0.2) provided $q'/q \geqslant 1$, which forces $1 < q < 2$. Hence Theorems 1.1 and 3.4 are valid only for this range of q. However, this does not affect the main result, as the thrust of the result is about the regularity in the space variable x which is given by the range for p, which is unaffected by this restriction.