Correction to: Long time dynamics for semi-relativistic NLS and half wave in arbitrary dimension

Jacopo Bellazzini¹ · Vladimir Georgiev^{2,3,4} · Nicola Visciglia²

Published online: 16 March 2020

© Springer-Verlag GmbH Germany, part of Springer Nature 2020

Correction to: Math. Ann. (2018) 371:707–740

<https://doi.org/10.1007/s00208-018-1666-z>

The assumptions of Theorem 1.2 are not correct in case $n = 1$. In dimension $n = 1$, instead of $1 + \frac{2}{n} < p < 1 + \frac{2}{n-1}$ it is correct $3 < p < 5$. Indeed the scaling argument in Proposition 3.1 works only if $3 < p < 5$. The correct Theorem is now the following:

Theorem 1.2 *Let $3 < p < 5$ if $n = 1$ and $1 + \frac{2}{n} < p < 1 + \frac{2}{n-1}$ if $n \geq 2$. There exists $r_0 > 0$ such that the following conditions occur for every $r \in (0, r_0)$:*

- $\mathcal{J}_r > -\infty$, $\mathcal{B}_r \neq \emptyset$ and $\mathcal{B}_r \subset B_{1/2} \cap H^1(\mathbb{R}^n)$, where

$$\mathcal{B}_r := \{v \in S_r \cap B_1 \text{ s.t. } \mathcal{E}_s(v) = \mathcal{J}_r\}.$$

In particular for every $v \in \mathcal{B}_r$ there exists $\omega \in \mathbb{R}$ such that

$$\sqrt{1 - \Delta}v + \omega v - v|v|^{p-1} = 0;$$

The original article can be found online at <https://doi.org/10.1007/s00208-018-1666-z>.

✉ Nicola Visciglia
viscigli@dm.unipi.it

Jacopo Bellazzini
jbellazzini@uniss.it

Vladimir Georgiev
georgiev@dm.unipi.it

¹ Università di Sassari, Via Piandanna 4, 70100 Sassari, Italy

² Dipartimento di Matematica, Università di Pisa, Largo B. Pontecorvo 5, 56100 Pisa, Italy

³ Faculty of Science and Engineering, Waseda University, 3-4-1, Okubo, Shinjuku-ku, Tokyo 169-8555, Japan

⁴ IMI-BAS, Acad. Georgi Bonchev Str., Block 8, 1113 Sofia, Bulgaria

- the elements in $\mathcal{B}_r$ are ground states on S_r , namely:

$$\inf_{\mathcal{C}_r} \mathcal{E}_s(w) = \mathcal{I}_r \text{ where } \mathcal{C}_r = \{w \in S_r \text{ s.t. } \mathcal{E}'_s|_{S_r}(w) = 0\}.$$

Assume moreover the following assumption:

$$\sup_{(-T_-(f), T_+(f))} \|u(t, x)\|_{H^{1/2}(\mathbb{R}^n)} < \infty \Rightarrow T_{\pm}(f) = \infty \quad (1.10)$$

where $(-T_-(f), T_+(f))$ is the maximal time of existence of $u(t, x)$ which is the nonlinear solution to sNLS with initial datum $f(x) \in H^1_{rad}(\mathbb{R}^n)$. Then we get:

- the set $\mathcal{B}_r \cap H^{1/2}_{rad}(\mathbb{R}^n)$ is weakly orbitally stable for the flow associated with sNLS.

We warmly thank Louis Jeanjean for pointing out this mistake.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.