ERRATUM

Erratum to: Quasilinear elliptic equations on $\mathbb{R}^N$ with singular potentials and bounded nonlinearity

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Recently it came to the author's attention that it is hard to find a *continuous* function f that satisfies simultaneously the assumptions $f(0) = 0$ and (f_3) in the original version of this article. The purpose of this note is to revise Theorem 1.1 in the original paper.

Consider the quasilinear problem

$$(P) \quad \begin{cases} -\operatorname{div}(|\nabla u|^{p-2}\nabla u) + V(|x|)|u|^{p-2}u = Q(|x|)f(u), & x \in \mathbb{R}^N, \\ u(x) \rightarrow 0, & |x| \rightarrow \infty, \end{cases}$$

where $1 < p < N$ and $V, Q : (0, \infty) \rightarrow (0, \infty)$ are two continuous functions satisfying the assumptions

(V) there exist real numbers a and a_0 such that

$$\liminf_{r \rightarrow \infty} \frac{V(r)}{r^a} > 0, \quad \liminf_{r \rightarrow 0} \frac{V(r)}{r^{a_0}} > 0,$$

(Q) there exist real numbers b and b_0 such that

$$\limsup_{r \rightarrow \infty} \frac{Q(r)}{r^b} < \infty, \quad \limsup_{r \rightarrow 0} \frac{Q(r)}{r^{b_0}} < \infty,$$

The nonlinear function $f : \mathbb{R} \rightarrow \mathbb{R}$ satisfies the conditions

- (f_1) $f \in C(\mathbb{R}; \mathbb{R})$;
- (f_2) There is $C_1 > 0$ such that $|f(u)| \leq C_1$ for $u \in \mathbb{R}$.

We restate Theorem 1.1 in the original paper as follows.

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Theorem 1.1. *Assume (V) and (Q) with*

$$b_0 > \min \left\{ \frac{N-p}{p} - N, \frac{p(N-1) + a_0(p-1)}{p^2} - N \right\},$$

$$b < \max \left\{ \frac{N-p}{p} - N, \frac{p(N-1) + a(p-1)}{p^2} - N \right\}.$$

If f satisfies (f_1) and (f_2) , then the problem (P) has at least one solution in $W_r^{1,p}(\mathbb{R}^N; V)$. □

For the definition of the space $W_r^{1,p}(\mathbb{R}^N; V)$, one refers to the original paper. The proof of Theorem 1.1 here can be done with less difficulty by modifying the processes of the proof in the original paper and so the details are omitted.

The origin result of Theorem 1.1 in the original paper may be true for a noncontinuous function f satisfying $(f_1) - (f_4)$ via non-smooth critical point theory. The author is now working on this project.

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