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ERRATUM

Erratum to: Nonlocal fourth-order Kirchhoff systems with variable growth: low and high energy solutions

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The goal of this erratum is to correct a mistake that appears in the assumption (M_2) in the original article. In the correct version, the hypothesis (M_2) should be removed. In such a case, we restate the following assumption:

(M_1) There exist $m_2 \geq m_1 > 0$ and $\alpha > 1$ such that $m_1 t^{\alpha-1} \leq M(t) \leq m_2 t^{\alpha-1}$, for all $t \in \mathbb{R}^+$.

We point out that the original assumption (M_1) implies $\alpha_1 = \alpha_2$, so we rename constant α. In conditions (F_2) and (F_5), we replace β by α.

The correct statement of Lemma 3.2 is the following.

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Lemma 3.2 *Let (u_n, v_n) be a Palais–Smale sequence for the Euler–Lagrange functional J. Assume that conditions (M_1), (F_2) are satisfied and*

$$m_1\theta_1(p^-)^{\alpha-1} > \alpha m_2, \quad m_1\theta_2(q^-)^{\alpha-1} > \alpha m_2. \tag{0.1}$$

Then the sequence (u_n, v_n) is bounded.

In the proof of Lemma 3.2, by hypotheses (0.1), (M_1) and (F_2), we can write for n large enough

$$\begin{aligned} c_7 \geq J(u_n, v_n) &\geq \frac{m_1}{\alpha}\left(\int_\Omega \frac{1}{p(x)}|\Delta u_n|^{p(x)}\,dx\right)^\alpha - \int_\Omega \frac{u_n}{\theta_1}\frac{\partial F}{\partial u}(x, u_n, v_n)\,dx \\ &+ \frac{m_1}{\alpha}\left(\int_\Omega \frac{1}{q(x)}|\Delta v_n|^{q(x)}\,dx\right)^\alpha - \int_\Omega \frac{v_n}{\theta_2}\frac{\partial F}{\partial v}(x, u_n, v_n)\,dx - c_8, \end{aligned}$$

where c_8 is a positive constant. Therefore

$$\begin{aligned} c_7 &\geq J(u_n, v_n) \\ &\geq \frac{m_1}{\alpha}\left(\int_\Omega \frac{1}{p(x)}|\Delta u_n|^{p(x)}\,dx\right)^\alpha - \frac{m_2}{\theta_1}\left(\int_\Omega \frac{1}{p(x)}|\Delta u_n|^{p(x)}\,dx\right)^{\alpha-1}\int_\Omega |\Delta u_n|^{p(x)}\,dx \\ &\quad + \frac{1}{\theta_1}D_1 J(u_n, v_n)(u_n) \\ &\quad + \frac{m_1}{\alpha}\left(\int_\Omega \frac{1}{q(x)}|\Delta v_n|^{q(x)}dx\right)^\alpha - \frac{m_2}{\theta_2}\left(\int_\Omega \frac{1}{q(x)}|\Delta v_n|^{p(x)}\,dx\right)^{\alpha-1}\int_\Omega |\Delta v_n|^{p(x)}\,dx \\ &\quad + \frac{1}{\theta_2}D_2 J(u_n, v_n)(v_n) - c_8 \\ &\geq \left(\frac{m_1}{\alpha} - \frac{m_2}{\theta_1(p^-)^{\alpha-1}}\right)\left(\int_\Omega |\Delta u_n|^{p(x)}\,dx\right)^\alpha + \left(\frac{m_1}{\alpha} - \frac{m_2}{\theta_2(q^-)^{\alpha-1}}\right)\left(\int_\Omega |\Delta v_n|^{q(x)}dx\right)^\alpha \\ &\quad - \frac{1}{\theta_1}\|D_1 J(u_n, v_n)\|_{*,p(x)}\|u_n\| - \frac{1}{\theta_2}\|D_2 J(u_n, v_n)\|_{*,q(x)}\|v_n\| - c_8. \end{aligned}$$

Now, we suppose that the sequence (u_n, v_n) is not bounded. Without loss of generality, we may assume $\|u_n\|_{p(x)} \geq \|v_n\|_{q(x)}$. Therefore, for n large enough so that $\|u_n\|_{p(x)} > 1$, we obtain

$$\begin{aligned} c_7 \geq &\left(\frac{m_1}{\alpha} - \frac{m_2}{\theta_1(p^-)^{\alpha-1}}\right)\|u_n\|_{p(x)}^{\alpha p^-} \\ &- \left(\frac{1}{\theta_1}\|D_1 J(u_n, v_n)\|_{*,p} + \frac{1}{\theta_2}\|D_2 J(u_n, v_n)\|_{*,q}\right)\|u_n\|_{p(x)}. \end{aligned}$$

But this cannot hold since $\alpha p^- > p^- > 1$. Hence, (u_n, v_n) is bounded.

Theorem 3.1 and Lemma 3.3 remain unchanged. However, Theorems 3.4, 4.1, 4.2 and Lemmas 3.2, 3.3 need to be stated without assumption (M_2). Hypothesis (0.1) should be also added in the statement of Theorems 3.4 and 4.1. The proofs of Theorems 3.4 , 4.1 and 4.2 are similar to the original proofs, but replacing β by α.