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Calculus of Variations

CORRECTION

Correction to: Fractional Kirchhoff problems with critical Trudinger–Moser nonlinearity

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The estimate obtained in [1, Lemma 3.3] is wrong. We correct this error and we point out the corresponding modifications in accordance with this estimate.

In [1], we studied the existence of ground state solutions for a fractional Kirchhoff problem with exponential growth. The correct statement of Lemma 3.3 in [1] is the following.

Lemma 3.3 *Assume that* (M_2), (f_2) *and* (f_6) *hold. Then*

$$c_* < \frac{s}{N}\mathscr{M}\left(\left(\frac{\alpha_{N,s}}{\alpha_0}\right)^{(N-s)/s}\right).$$

The proof of this lemma is the same as in [1] *and it reduces to replacing* $\frac{\alpha_{N,s}}{\alpha_0}$ *by* $(\frac{\alpha_{N,s}}{\alpha_0})^{(N-s)/s}$.

Accordingly, the related parts which used the result of Lemma 3.3 should be corrected. Hence, in the proof of Lemma 4.1,

$$\frac{s}{N}\mathscr{M}(\|u_n\|^{N/s}) \to c_* < \frac{s}{N}\mathscr{M}\left(\frac{\alpha_{N,s}}{\alpha_0}\right)$$

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should be corrected as follows

$$\frac{s}{N}\mathscr{M}(\|u_n\|^{N/s}) \to c_* < \frac{s}{N}\mathscr{M}\left(\left(\frac{\alpha_{N,s}}{\alpha_0}\right)^{(N-s)/s}\right).$$

- On page 1 line 7, in Abstract, $\exp(\alpha t^2)$ should be replaced with $\exp(\alpha|t|^{N/(N-s)})$.
- On page 6 line 5, the correct definition of λ^* in (f_3) is

$$\lambda^* := \inf_{u\in W_0^{s,N/s}(\Omega)\setminus\{0\}} \frac{\|u\|^{\theta N/s}}{\|u\|^{\theta N/s}_{L^{\theta N/s}(\Omega)}} > 0.$$

- On page 6 line 12, in assumption (f_6), $\frac{\alpha_{N,s}}{\alpha_0}$ should be replaced with $(\frac{\alpha_{N,s}}{\alpha_0})^{(N-s)/s}$.
- On page 18 lines 7 and 8, $\|u_n\|^{N/s}$ should be replaced by $\|u_n\|^{N/(N-s)}$.
- On page 18 line-11, the estimate of $\left|\int_\Omega f(x,u_n)u_n dx\right|$ should be corrected as follows

$$\begin{aligned}\left|\int_\Omega f(x,u_n)u_n dx\right| &\le C\left(\int_\Omega |u_n|^{\theta N/s}dx + \int_\Omega |u_n|\exp(\alpha|u_n|^{N/(N-s)})dx\right)\\ &\le C\left(\|u_n\|^{\theta N/s}_{L^{\frac{\theta N}{s}}(\Omega)} + \|u_n\|_{L^{\frac{q}{q-1}}(\Omega)}\right.\\ &\quad\left.\left(\int_\Omega \exp[q\alpha\|u_n\|^{N/(N-s)}(u_n/\|u_n\|)^{N/(N-s)}]dx\right)^{\frac{1}{q}}\right)\\ &\le C\left(\|u_n\|^{\theta N/s}_{L^{\frac{\theta N}{s}}(\Omega)} + \|u_n\|_{L^{\frac{q}{q-1}}(\Omega)}\right)\to 0.\end{aligned}$$

- On page 20 line 5, replace v_0, u_0 by v, u, respectively.
- On page 20 line 7, estimate (4.8) should be replaced by

$$\sup_{n\in\mathbb{N}}\int_\Omega \exp(\alpha' v_n^{N/(N-s)})dx < \infty,\quad \forall\,\alpha' < \frac{\alpha_{N,s}}{(1-\|v\|^{N/s})^{s/(N-s)}}.$$

- On page 20 line-8, the inequality should be corrected as follows

$$\xi^{N/s} < \frac{(\alpha_{N,s}/\alpha_0)^{(N-s)/s}}{1-\|v\|^{N/s}}.$$

- On page 20 line-6, the inequality should be corrected as follows

$$\alpha_0\|u_n\|^{N/(N-s)} < \alpha'' < \frac{\alpha_{N,s}}{(1-\|v\|^{N/s})^{s/(N-s)}}.$$

- On page 20 line-4, the inequality should be corrected as follows

$$\nu\alpha\|u_n\|^{N/(N-s)} \le \alpha'' < \frac{\alpha_{N,s}}{(1-\|v\|^{N/s})^{s/(N-s)}}.$$

- On page 21 line 3, replace $\|u_n\|^{N\theta/s}_{L^{\frac{N\theta}{s}}(\Omega)}$ by $\|u_n-u\|^{N\theta/s}_{L^{\frac{N\theta}{s}}(\Omega)}$.
- On page 21 line 11, replace $\|v\|$ by $\|v\|^{p-1}$.
- On page 21 line-6, replace ε by φ.
- On page 22 line-11, in the estimate of $\mathcal{I}_\lambda(u)$, there is missed the factor $\frac{s}{N}$ before $\frac{\mathscr{M}(t_*)}{t_*^\theta}$. Similarly, in the definition of $g(t)$, there is missed the factor $\frac{s}{N}$ before $\frac{\mathscr{M}(t_*)}{t_*^\theta}$.

- On page 22 line-1, $t_{\max}$ should be corrected as follows

$$t_{\max} = \left(\frac{\mathscr{M}(t_*)\theta}{C_{N,s} t_*^{\theta} \lambda} \right)^{\frac{s}{sq-N\theta}} > 0,$$

and Λ^* should be replaced by

$$\Lambda^* = \frac{\mathscr{M}(t_*)\theta}{C_{N,s} t_*^{\theta} \widetilde{\rho}_1^{q-\frac{N\theta}{s}}}.$$

- On page 25 line 12, $\widetilde{\rho}_\lambda$ should be corrected as follows

$$\widetilde{\rho}_\lambda := \left(\frac{\mathscr{M}(t_*)\theta}{C_{N,s} t_*^{\theta} \lambda} \right)^{\frac{s}{sq-N\theta}}.$$

Reference

1. Mingqi, X., Rădulescu, V.D., Zhang, B.: Fractional Kirchhoff problems with critical Trudinger–Moser nonlinearity. Calc. Var. Partial Differ. Equ. **58**(2), 57 (2019)