DE GRUYTER Adv. Nonlinear Stud. 2016; 16 (1):173–174

Corrigendum

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Corrigendum to: The Dirichlet problem with mean curvature operator in Minkowski space

DOI: 10.1515/ans-2015-5030

Corrigendum to: C. Bereanu, P. Jebelean and J. Mawhin, The Dirichlet problem with mean curvature operator in Minkowski space – A variational approach, Adv. Nonlinear Stud. 14 (2014), no. 2, 315–326

Communicated by: Shair Ahmad

We essentially use Lemma 2.1 which is proved in [1]. Accordingly, the set Ω must be "a bounded *domain* in $\mathbb{R}^N$ ($N \geq 2$) with boundary $\partial\Omega$ of class C^2", instead of "an *open bounded set* in $\mathbb{R}^N$ with boundary $\partial\Omega$ of class C^2". This change does not affect the validity of the results stated in the paper. But, it affects the proof of Lemma 3.1. In this view, the only necessary modification is the following.

Proof of Lemma 3.1. It suffices to show that $u \geq 0$ in Ω. From (2.2), (3.4) and the integration by parts formula it follows

$$-\int_\Omega \frac{\nabla u \cdot \nabla v}{\sqrt{1-|\nabla u|^2}} = \int_\Omega \mu(x)|u|^{q-1}uv - \lambda \int_\Omega \overline{g}(x,u)v, \tag{1}$$

for all $v \in W^{1,\infty}(\Omega)$ with $v|_{\partial\Omega} = 0$. We denote

$$\mathcal{O} := \{x \in \Omega : u(x) < 0\}, \quad u^- := \min\{0, u\}, \quad \mathcal{O}' := \{x \in \mathcal{O} : |\nabla u^-(x)| > 0\}.$$

From [2, Theorem A.1] we have $u^- \in W^{1,\infty}(\Omega)$ and $\nabla u^- = \nabla u$ in $\mathcal{O}$, $\nabla u^- = 0_{\mathbb{R}^N}$ in $\Omega \setminus \mathcal{O}$. So, taking $v = u^-$ in (1) and using hypothesis (H), it follows

$$-\int_{\mathcal{O}} \frac{|\nabla u^-|^2}{\sqrt{1-|\nabla u^-|^2}} = \int_{\mathcal{O}} \mu(x)|u^-|^{q+1} \geq 0. \tag{2}$$

If meas $\mathcal{O}' > 0$, then from (2) we get the contradiction

$$0 > -\int_{\mathcal{O}'} \frac{|\nabla u^-|^2}{\sqrt{1-|\nabla u^-|^2}} \geq 0.$$

Consequently, meas $\mathcal{O}' = 0$ and, as $\nabla u^- = 0_{\mathbb{R}^N}$ in $\Omega \setminus \mathcal{O}$, we get that $\nabla u^- = 0_{\mathbb{R}^N}$ a.e. on Ω. As Ω is a domain, we infer that $u^- =$ const., hence $u^- \equiv 0$ in Ω. This means $u \geq 0$ in Ω. □

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References

[1] C. Corsato, F. Obersnel, P. Omari and S. Rivetti, Positive solutions of the Dirichlet problem for the prescribed mean curvature equation in Minkowski space, *J. Math. Anal. Appl.* **405** (2013), 227–239.
[2] D. Kinderlehrer and G. Stampacchia, *An Introduction to Variational Inequalities and Their Applications*, Academic Press, New York, 1980.