Advances in Mathematics 328 (2018) 1353–1359

Contents lists available at ScienceDirect

Advances in Mathematics

www.elsevier.com/locate/aim

Corrigendum

Corrigendum to: "Nonlinear Muckenhoupt–Wheeden type bounds on Reifenberg flat domains, with applications to quasilinear Riccati type equations" [Adv. Math. 250 (2014) 387–419]

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ARTICLE INFO

Article history:
Received 23 June 2017
Received in revised form 3 January 2018
Accepted 8 January 2018
Available online 13 February 2018
Communicated by the Managing Editors

MSC:
primary 35J60, 35J61, 35J62
secondary 35J75, 42B37

Keywords:
Measure datum problem
p-Laplacian
Weighted norm inequality
Quasi-linear elliptic equation
Riccati type equation
Muckenhoupt–Wheeden type bound

DOI of original article: https://doi.org/10.1016/j.aim.2013.09.022.
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[1] Supported in part by Simons Foundation, award number 426071.

https://doi.org/10.1016/j.aim.2018.01.011

N.C. Phuc, *Nonlinear Muckenhoupt–Wheeden type bounds on Reifenberg flat domains, with applications to quasilinear Riccati type equations*, Adv. Math. **250** (2014), 387–419.

The proof of Theorem 1.6 in the above paper contains a gap. In general, the continuity of the map S stated in Lemma 5.8 may fail. This error was inherited from our earlier work [28, Theorem 3.4], which has now been corrected in the erratum [2].

The purpose of this note is to fix this gap following the main idea of [2]. We shall use the same notation as in the paper. Given a nonnegative locally finite measure ν in $\mathbb{R}^n$, we define its first order Riesz's potentials by

$$\mathbf{I}_1^\rho \nu(x) = \int_0^\rho \frac{\nu(B_t(x))}{t^{n-1}} \frac{dt}{t}, \qquad x \in \mathbb{R}^n, \tag{0.1}$$

where $\rho \in (0, \infty]$. When $\rho = \infty$, we write $\mathbf{I}_1 \nu$ instead of $\mathbf{I}_1^\infty \nu$ and note that in this case we have

$$\mathbf{I}_1 \nu(x) = c(n) \int_{\mathbb{R}^n} \frac{1}{|x-y|^{n-1}} d\nu(y), \qquad x \in \mathbb{R}^n.$$

In what follows, given a finite signed measure in Ω we will tacitly extend it by zero to $\mathbb{R}^n \setminus \Omega$. Also, recall that the space $M^{1,\frac{q}{q-p+1}}(\Omega)$ is defined in Definition 5.5.

Let $M = M(n) \geq 1$ be a constant such that

$$\sup_{r>0} \frac{1}{|B_r(x)|} \int_{B_r(x)} \mathbf{I}_1(f)(y) dy \leq M\, \mathbf{I}_1(f)(x), \qquad x \in \mathbb{R}^n, \tag{0.2}$$

for all $f \in L^1_{\mathrm{loc}}(\mathbb{R}^n)$, $f \geq 0$. Inequality (0.2) follows from an application of Fubini's Theorem and the fact the function $x \mapsto |x|^{1-n}$ is an A_1 weight. By an A_1 weight we mean a nonnegative function $w \in L^1_{\mathrm{loc}}(\mathbb{R}^n)$, $w \not\equiv 0$, such that

$$\sup_{r>0} \frac{1}{|B(x,r)|} \int_{B(x,r)} w(y) dy \leq C\, w(x), \qquad \text{a.e. } x \in \mathbb{R}^n,$$

for a constant $C > 0$. The least possible value of C will be denoted by $[w]_{A_1}$ and is called the A_1 constant of w. It is well-known that $A_1 \subset A_\infty$.

With $R = \mathrm{diam}(\Omega)$, for each measure $\omega \in M^{1,\frac{q}{q-p+1}}(\Omega)$ we define the set

$$E_1(\omega) := \Big\{ v \in W_0^{1,q}(\Omega) : \int_\Omega |\nabla v|^q w dx \leq T_1 \int_\Omega \mathbf{I}_1^{2R}(|\omega|)^{\frac{q}{p-1}} w dx$$
$$\text{for all } w \in A_1 \cap L^\infty(\mathbb{R}^n) \text{ such that } [w]_{A_1} \leq M \Big\}.$$