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Correction to

The growth of entire and harmonic functions along asymptotic paths

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It was brought to the authors' attention by J. M. Wu that the proof of Lemma 3 in our paper is incorrect, leaving a gap in the proof of Theorem 2. In this short note we will give a correct proof of Theorem 2. We will use all the notation including references and numbering that appear in the original paper.

Although Lemma 1 is correct as stated we need to restate it with (2.1) replaced with

$$\varliminf_{r\to\infty} (\log r)^{-1}\pi \int_1^r dt/t\theta^*(t) = \alpha \tag{2.1}$$

Note that we have dropped any reference to log density. Clearly (2.1) and (2.11) lead directly to (2.12) and the rest follows exactly as before.

Lemma 3 is in fact incorrect as stated. If we change (5.1) to

$$\varlimsup_{r\to\infty} (\log r)^{-1}\pi \int_1^r dt/t\theta^*(t) \leq \rho, \tag{5.1}$$

(dropping any reference to log density), then Lemma 3 is correct. To prove this version of Lemma 3, assume that (5.1) is false then there exists $\rho_1 > \rho$ and a sequence $R_n \to \infty$ such that

$$\pi \int_1^{R_n} dt/t\theta^*(t) > \rho_1 \log R_n \tag{5.2}$$

Let $z \in D$ and chose R_n such that $|z| < R_n/4$. With the notation of (2.11) and (5.2)

we have

$$w_{R_n}(z) \leq 9\sqrt{2}\,(|z|/R_n)^{\rho_1} \tag{5.3}$$

The rest of the proof of Lemma 3 now follows exactly as the proof of the original version with R replaced by R_n and $\rho_2(1-\varepsilon_m)$ by ρ_1. The proof of our new Lemma 3 is complete.

We may now give the proof of Theorem 2. First we restate (5.4) to read

$$\varliminf_{r\to\infty} (\log r)^{-1}\, \pi \int_1^r dt/t\theta_1^*(t) = \alpha\,(\tfrac{1}{2} \leq \alpha < \infty), \tag{5.4}$$

where θ_1^* corresponds to θ^* for D_1. Then, since there exists another component of $\{|f| > K\}$, D_2, it can be easily seen (c.f. [3, Lemma 4]) that (5.4) implies

$$\varlimsup_{r\to\infty} (\log r)^{-1}\pi \int_1^r dt/t\theta_2^*(t) \geq (2\alpha - 1)/\alpha \tag{5.5}$$

where θ_2^* corresponds to θ^* for D_2. By Lemma 3 we must have $\pi/\rho \leq 2\pi - (\pi/\alpha)$ or

$$\alpha \geq \rho/(2\rho - 1) \tag{5.6}$$

This proof now continues as in the original paper.

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