Correction to: On the Isoperimetric Inequality for the Magnetic Robin Laplacian with Negative Boundary Parameter

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In the formulation of Proposition 4.4 in our paper [3] it was necessary to assume in addition that the domain $\Omega$ is convex. Thus, we can only prove that all bounded $C^2$-smooth convex centrally symmetric domains are subordinate to the disk of the same perimeter, in the sense of Definition 4.2. The corrected proposition is now formulated as follows.

Amended Proposition 4.4 If $\Omega \subset \mathbb{R}^2$ is convex and centrally symmetric then it is subordinate to $B$ in the sense of Definition 4.2.

In view of this correction, “centrally symmetric domains” were replaced by “convex centrally symmetric domains” in the abstract and the introduction.

The convexity assumption is used when we conclude in the proof of Proposition 4.4 that $\partial \Omega_t$ is a piecewise $C^2$-smooth closed curve for almost all $t \in (0, r_i)$. In general, according to [2, Proposition 6.1], $\partial \Omega_t$ is a finite union of closed piecewise $C^2$-smooth curves for almost all $t \in (0, r_i)$ and is not necessarily connected. However, under the convexity assumption on $\Omega$, it follows from [1, Theorem 5.4(i)] that the distance function $\rho_{\partial \Omega}(\cdot) := \text{dist}(\cdot, \partial \Omega)$ is concave on $\Omega$, hence the domain

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\( \Omega_t = \{ x \in \Omega : \rho_{\partial \Omega}(x) > t \} \) is convex and \( \partial \Omega_t \) is connected. In order to take this argument into account one sentence in the proof of Proposition 4.4 was modified. It was also necessary to update Remark 4.7 related to Proposition 4.4 by assuming in addition that the level curves \( \partial \Omega_t \) are connected. Thus, the corrected Remark 4.7 states that if \( \partial \Omega_t \) is connected with the same centroid for all \( t \in (0, r) \), then the domain \( \Omega \) is also subordinate to the disk of the same perimeter, in the sense of Definition 4.2.

Finally, a misprint in Remark 3.4 was corrected. We replaced \( \beta_c(b, \Omega) \) by \( \beta_c(b, B) \).

The original article has been corrected.

References

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