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CORRIGENDA: "STABILIZATION IN $H^\infty_{\mathbb{R}}(\mathbb{D})$"

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Abstract

In this corrigenda we outline the necessary changes to the paper [**3**] so that the main result in that paper is made correct. The mistake the author made in the previous version was that the condition that f_1 being positive on the zeros of f_2 was not strong enough to guarantee the existence of the logarithm in $H^\infty_{\mathbb{R}}(\mathbb{D})$.
In particular, the main result now is the following theorem: Suppose that $f_1, f_2 \in H^\infty_{\mathbb{R}}(\mathbb{D})$, with $\|f_1\|_\infty, \|f_2\|_\infty \leq 1$, with

$$\inf_{z\in\mathbb{D}} (|f_1(z)| + |f_2(z)|) = \delta > 0.$$

Assume for some $\epsilon > 0$, f_1 has the same sign on the set $\{x \in (-1,1) : |f_2(x)| < \epsilon\}$. Then there exists $g_1, g_1^{-1}, g_2 \in H^\infty_{\mathbb{R}}(\mathbb{D})$ with $\|g_1\|_\infty, \|g_2\|_\infty, \|g_1^{-1}\|_\infty \leq C(\delta,\epsilon)$ and

$$f_1(z)g_1(z) + f_2(z)g_2(z) = 1 \quad \forall\, z \in \mathbb{D}.$$

1. Introduction

In the original paper [**3**] the proof of the main result is unfortunately incorrect, however the method of proof is the correct approach. In this corrigenda, we outline the modifications necessary to modify the existing proof to be correct. The full version of the paper with the necessary corrections has been posted to the `http://arxiv.org/abs/0809.1573`.

The problem with the main result in [**3**] is that the initial hypothesis was that f_1 was of the same sign on the real zeros of f_2. This condition, while necessary is unfortunately not strong enough to be sufficient and to guarantee that the logarithm will exist in $H^\infty_{\mathbb{R}}(\mathbb{D})$. First, we need to extend the definition of positive on zeros. This is accomplished by the following lemma.

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