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

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Abstract

It is shown that for $H^\infty_\mathbb{R} (\mathbb{D})$ functions $f_1$ and $f_2$ with

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

and $f_1$ being positive on the real zeros of $f_2$, then there exists $H^\infty_\mathbb{R} (\mathbb{D})$ functions $g_2$ and $g_1$, $g_1^{-1}$ with norm controlled by a constant depending only on $\delta$ and

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

These results are connected to the computation of the stable rank of the algebra $H^\infty_\mathbb{R} (\mathbb{D})$ and to results in Control Theory.