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Talk The spectra of endomorphisms of analytic Lipschitz algebras pp.: 1–3

The spectra of endomorphisms of analytic Lipschitz algebras

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Abstract

In this paper the spectra of certain endomorphisms of the analytic Lipschitz algebras $Lip_A(\bar{\mathbb{D}}, \alpha)$ are determined. We consider endomorphisms T of $Lip_A(\bar{\mathbb{D}}, \alpha)$ defined by $T(f) = f \circ \varphi$ for some $\varphi \in Lip_A(\bar{\mathbb{D}}, \alpha)$ for the case where φ has an interior fixed point.

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1 Introduction

An endomorphism of an algebra B is a linear operator T of B into itself satisfying $T(ab) = (Ta)(Tb)$ for all $a, b \in B$. If a Banach function algebra B on a compact Hausdorff space X is natural, then every nonzero endomorphism T of B has the form $Tf = f \circ \varphi$ for a self-map φ of X. We call T the endomorphism of B induced by φ. The spectrum of an operator T on an algebra B is the set of complex numbers λ for which $\lambda - T$ is not invertible. We denote the spectrum of an operator T by $\sigma(T)$.

Let (X, d) be a metric space and $0 < \alpha \leq 1$. The complex valued function f on X is said to satisfy the Lipschitz condition of order α on X, if there exists a constant $K > 0$ such that $|f(x) - f(y)| \leq Kd(x, y)^\alpha$, for all $x, y \in X$. In this case we write

$$p_\alpha(f) = \sup\{\frac{|f(x) - f(y)|}{d(x, y)^\alpha} : x, y \in X, x \neq y\}.$$

Suppose that $\mathbb{D}$ is the open unit disc in the complex plane $\mathbb{C}$. The analytic Lipschitz algebra on the closed unit disc $\bar{\mathbb{D}}$, $Lip_A(\bar{\mathbb{D}}, \alpha)$ is the algebra of functions f analytic in the open unit disc $\mathbb{D}$ that satisfy a Lipschitz condition of order α on $\bar{\mathbb{D}}$. It is well known that the analytic Lipschitz algebra $Lip_A(\bar{\mathbb{D}}, \alpha)$ is a natural Banach function algebra with the norm

$$\|f\| = |f|_{\bar{\mathbb{D}}} + p_\alpha(f) \qquad (f \in Lip_A(\bar{\mathbb{D}}, \alpha)),$$

where $|f|_{\bar{\mathbb{D}}} = \sup_{z \in \bar{\mathbb{D}}} |f(z)|$.

Kamowitz in [2] determined the spectra of a class of endomorphisms of the disc algebra $A(\bar{\mathbb{D}})$, the uniform algebra of functions analytic on the open unit disc $\mathbb{D}$ and continuous on

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