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Complex symmetric weighted composition operators on the weighted Hardy spaces.

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Abstract

Recently many authors have worked on normal weighted composition operators. On the other hand, it is known that every normal operator is a complex symmetric operator. Therefore, in this paper, we study complex symmetric weighted composition operators on the weighted Hardy spaces.

Keywords: Weighted Hardy Space, Weighted Composition Operator, Complex Symmetric.
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1 Introduction

In 2010, C. C. Cowen and E. Ko obtained an explicit characterization and spectral description of all hermitian weighted composition operators on the classical Hardy space H^2 [5]. This work was later extended to certain weighted Hardy spaces by C. C. Cowen, G. Gunatillake, and E. Ko [4]. Along similar lines, P. Bourdon and S. Narayan have recently studied weighted composition operators on H^2 [1]. Taken together, theses articles have established the existence of several unexpected families of normal weighted composition operators. Then S. R. Garcia and C. Hammond in [11] investigated complex symmetric weighted composition operators on the weighted Hardy spaces.

Definition 1.1. Let $\mathbb{D}$ be the open unit disk in the complex plane $\mathbb{C}$. Let H be a Hilbert space of functions analytic on the unit disk. If the monomials $1, z, z^2, ...$ are an orthogonal set of non-zero vectors with dense span in H, then H is called a weighted Hardy space. We will assume that the norm satisfies the normalization $\|1\| = 1$. The weight sequence for a weighted Hardy space H is defined to be $\beta(n) = \|z^n\|$. The weighted Hardy space with weight sequence $\beta(n)$ will be denoted $H^2(\beta)$. The norm on $H^2(\beta)$ is given by

$$\left\|\sum_{j=0}^{\infty} a_j z^j\right\|^2 = \sum_{j=0}^{\infty} |a_j|^2 \beta(j)^2.$$

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