ON A CLASS OF WEIGHTED COMPOSITION OPERATORS ON THE BERGMAN SPACE OF THE UPPER HALF PLANE[*]

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Abstract

In this paper we consider a class of weighted composition operators $R_a, a \in \mathbb{D}$ defined on the Bergman space $L_a^2(\mathbb{U}_+)$ of the upper half plane. We showed that these classes of operators are unitary, self-adjoint and have numerical radius 1. We calculated the fixed points of these unitary operators and characterized the reducing subspace of $T \in \mathcal{L}(L_a^2(\mathbb{U}_+))$ that commutes with R_a. We also derived various algebraic properties of bounded linear operators defined on $L_a^2(\mathbb{U}_+)$, in terms of certain distance estimates involving the weighted composition operators R_a. Our main focus is on Toeplitz operators defined on $L_a^2(\mathbb{U}_+)$.

1   Introduction

Let $\mathbb{U}_+ = \{s = x + iy \in \mathbb{C} : y > 0\}$ be the upper half plane, and let $d\widetilde{A} = dxdy$ be the area measure on $\mathbb{U}_+$. Let $L^2(\mathbb{U}_+, d\widetilde{A})$ be the space of complex-valued, absolutely square integrable, measurable functions on $\mathbb{U}_+$

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