

BEREZIN TRANSFORM OF INVERTIBLE POSITIVE OPERATORS*

Namita Das[†] Madhusmita Sahoo[‡]

Abstract

In this paper we introduce a class $\mathcal{A} \subset L^\infty(\mathbb{D})$ such that if $\phi \in \mathcal{A}$ and satisfies certain positive-definite condition, then there exists a $\psi \in \mathcal{A}$ such that $\phi(z) \leq \alpha e^{\psi(z)}$, for some constant $\alpha > 0$. Further, if $\phi(z) = \langle Ak_z, k_z \rangle$, for some bounded positive, invertible operator A from the Bergman space $L_a^2(\mathbb{D})$ into itself then $\psi(z) = \langle (\log A)k_z, k_z \rangle$. Here $k_z, z \in \mathbb{D}$ are the normalized reproducing kernel of $L_a^2(\mathbb{D})$. Applications of these results are also discussed.

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keywords: Berezin transform, Bergman space, Invertible operators, Positive operators, Reproducing kernel.

1 Introduction

Let $dA(z)$ be the area measure on the open unit disk \mathbb{D} in the complex plane \mathbb{C} normalized so that the area of the disk is 1. That is, $dA(z) = \frac{1}{\pi} dx dy$. Let

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[†]namitadas440@yahoo.co.in, P.G.Department of Mathematics, Utkal University, Vani Vihar, Bhubaneswar- 751004, Odisha, India.

[‡]smita_782006@yahoo.co.in, School of Applied Sciences (Mathematics), KIIT Deemed to be University, Campus-3(Kathajori Campus), Bhubaneswar-751024, Odisha, India.