

# BEREZIN TRANSFORM OF INVERTIBLE POSITIVE OPERATORS\*

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DOI <https://doi.org/10.56082/annalsarscimath.2021.1-2.70>

## 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.

**2010 Mathematics Subject Classification:** 32A36 ; 47B38.

**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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\*Accepted for publication in revised form on July 7-th, 2020

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