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COMMUTATIVITY OF QUASI-HOMOGENEOUS H-TOEPLITZ OPERATORS ON THE FOCK SPACE

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Abstract. In this paper the commutativity of quasi-homogeneous H-Toeplitz operators on the Fock space is investigated. Necessary conditions for the commutativity of quasi-homogeneous H-Toeplitz operators are formulated in terms of Mellin transforms of the associated symbols. It is shown that if two quasi-homogeneous H-Toeplitz operators of even degree commute then their degrees are same. The case of odd degrees is also examined, and it is proved that a quasi-homogeneous H-Toeplitz operator of odd degree does not commute with one of even degree.

1. Introduction

Toeplitz and Hankel operators have played a central role in the development of modern operator theory, leading to numerous advances in functional analysis. Over the years, the Hardy, Bergman and Fock spaces have naturally emerged as fundamental settings for examining these operators and their extensions. In 1987, Berger and Coburn [6] studied Toeplitz operators on the Fock space, establishing a crucial link between Toeplitz operators and Weyl operators in quantum mechanics. This relationship has sparked significant interest among scholars [7, 9, 12]. Parallel investigations of Hankel operators have also been pursued in the Fock space setting [11, 13]. An important development in this direction came with the work of Arora and Paliwal [3], who introduced the class of H-Toeplitz operators.

Since their introduction, H-Toeplitz operators have remained an active area of research [1]. More recently, Aggarwal and Gupta [2] studied quasi-homogeneous Toeplitz operators on the Fock space. Motivated by these developments, we introduce the class of quasi-homogeneous H-Toeplitz operators and investigate their commutativity properties.

Consider the Gaussian measure $d\lambda(z) = \frac{1}{\pi}e^{-|z|^2}dA(z)$ on the complex plane $\mathbb{C}$ where $dA(z)$ denotes the area measure. The Fock space denoted by $\mathcal{F}^2(\mathbb{C})$, is a space of Gaussian square integrable entire functions on $\mathbb{C}$. The Fock space is a closed subspace

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