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ACCEPTED MANUSCRIPT

ON ZERO SETS IN FOCK SPACES

DRISS AADI, BRAHIM BOUYA, YOUSSEF OMARI

ABSTRACT. We prove that zero sets for distinct Fock spaces are not the same, this is an answer of a question asked by K. Zhu in [6, Page. 209].

1. INTRODUCTION AND STATEMENT OF MAIN RESULTS

For $\alpha > 0$ and p > 0 the Fock space \mathcal{F}^p_{α} consists of those entire functions f satisfying

$$||f||_{p,\alpha}^p := \int_{\mathbb{C}} |f(z)|^p dA_{p\alpha/2}(z) < \infty,$$

where

$$dA_{\beta}(z) := \frac{\beta}{\pi} e^{-\beta|z|^2} dA(z), \qquad \beta > 0,$$

and A represents the Lebesgue area measure on the complex plane \mathbb{C} . It is known that the space \mathcal{F}^p_{α} endowed with the norm $\|\cdot\|_{p,\alpha}$ is a Banach space when $p \geq 1$, while for p < 1 it is a complete metric space, see for instance [6, Chap. 2].

A sequence Λ of complex numbers is called a zero set for \mathcal{F}^p_{α} if there exists a function $f \in \mathcal{F}^p_{\alpha} \setminus \{0\}$ such that the zero set $\{z \in \mathbb{C} : f(z) = 0\}$ of f, counting multiplicities, coincides with Λ . At the present time there is no complete characterization of zero sets for Fock spaces. In [5] and [6, Chap. 5] K. Zhu has presented many properties enjoyed by zero sets in \mathcal{F}^p_{α} , in particular he proved that the spaces \mathcal{F}^p_{α} and \mathcal{F}^q_{β} always possess different zero sets in the case where $\alpha \neq \beta$, regardless of p and q. He then asked whether this remains true if $\alpha = \beta$, see [6, Page. 209].

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