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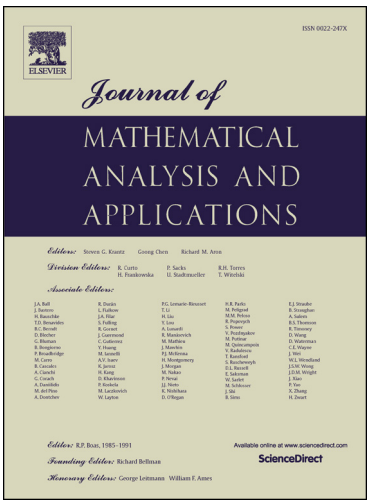

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ON ZERO SETS IN FOCK SPACES

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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 $\mathcal{F}^p_\alpha$ consists of those entire functions f satisfying

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

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 $\mathcal{F}^p_\alpha$ 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 $\mathcal{F}^p_\alpha$ if there exists a function $f \in \mathcal{F}^p_\alpha \backslash \{0\}$ 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 $\mathcal{F}^p_\alpha$, in particular he proved that the spaces $\mathcal{F}^p_\alpha$ and $\mathcal{F}^q_\beta$ 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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