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A class of weighted convolution Fréchet algebras

ABSTRACT. For an increasing sequence (ω_n) of algebra weights on $\mathbb{R}^+$ we study various properties of the Fréchet algebra $A(\omega) = \bigcap_n L^1(\omega_n)$ obtained as the intersection of the weighted Banach algebras $L^1(\omega_n)$. We show that every endomorphism of $A(\omega)$ is standard, if for all $n \in \mathbb{N}$ there exists $m \in \mathbb{N}$ such that $\omega_m(t)/\omega_n(t) \to \infty$ as $t \to \infty$. Moreover, we characterise the continuous derivations on this algebra: If for all $n \in \mathbb{N}$ there exists $m \in \mathbb{N}$ such that $t * \omega_n(t)/\omega_m(t)$ is bounded on $\mathbb{R}^+$, then the continuous derivations on $A(\omega)$ are exactly the linear maps D of the form $D(f) = (Xf) * \mu$ for $f \in A(\omega)$, where μ is a measure in $B(\omega) = \bigcap_n M(\omega_n)$ and $(Xf)(t) = tf(t)$ for $t \in \mathbb{R}^+$ and $f \in A(\omega)$. If the condition is not satisfied, we show that $A(\omega)$ has no non-zero continuous derivations.