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INVITED TALK

by

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entitled

The Laplace Transform for Nilpotent Lie Groups and Operator Analogue of Müntz–Szàsz's Theorem

For any connected and simply connected, nilpotent Lie group G, we generate an operator analog of Müntz-Szàsz's theorem proved way back in the case of the interval $[0,1]$. Such a result fails to hold when $[0,1]$ is replaced by an unbounded interval, and the key question is to improve the result of Müntz giving the equivalence between the divergence of the series $\sum_{k\geq 1}\frac{1}{\lambda_k}$ and the density of $\mathbb{C}$-span$\{t^{\lambda_1}, t^{\lambda_2}, \ldots\}$ in $L^2([0,1])$, for a strictly increasing sequence $(\lambda_k)_{k\in\mathbb{N}^\star}$ of positive real numbers. Thanks to the group Fourier transform operator, we construct a non-commutative analogue of the Laplace operator $L : L^1(G)\cap L^2(G)\ni f\mapsto L(f)$. For general nilpotent Lie groups, we show that the trivial function is the unique one meeting the assumptions $L(f)(\lambda_k)=0$ for any $k\in\mathbb{N}^\star$. We show that the equivalence holds for Heisenberg groups.

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