

SEMINARIO

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Hermite Functions and Fourier Series

Abstract: Hermite Functions play a fundamental role in the theory of Fourier Transform as eigenvectors of the Fourier Transform, a basis of L^2 functions in \mathbb{R} and a representation of the Lie algebra $\mathfrak{h}(1)$. We exhibit that, with an appropriate discretization and periodization, they cover the same role for Fourier Series and their inverse, the Discrete Time Fourier Transform.

Discretized and Periodized Hermite Functions are indeed:

- 1) Related by Fourier Series and its inverse.
- 2) Bases of the spaces $L^2(\mathbb{C})$ and $L^2(\mathbb{Z})$ where Fourier Series and their inverse act.
- 3) Representations of the same algebra $\mathfrak{h}(1)$.

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