

Info

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is written (completely with human hands) by [Rupadarshi Ray](#),
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Fourier transform on $L^2(-A, A) \leq L^2(\mathbb{R})$

Let $f \in L^1(-A, A)$ then

$$\hat{f}(z) := \int_{t \in (-A, A)} f(t) \exp(itz)$$

is an entire function of growth less than exponential

$$\begin{aligned} |\hat{f}(z)| &\leq \int_{t \in (-A, A)} |f(t)| \exp(-t\Im(z)) \\ &\leq e^{A|\Im(z)|} \int_{(-A, A)} |f| \end{aligned}$$

$L^2(-A, A)$

☰ (Paley-Wiener)

$$\hat{\cdot} : L^2(-A, A) \cong L^2(\mathbb{R}) \cap \{F \in \mathcal{O}(\mathbb{C}) \mid |F(\bullet)| \lesssim \exp(A|\bullet|) \text{ on } \mathbb{C}\}$$

$\mathcal{S}_{\mathbb{C}}^*$

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And it has 10 siblings.

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 - [Rf](#) subobjects of and functions on $\mathbb{R}^n, T^n, S^n, \mathbb{C}^n$
 - [Fourier](#)
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 - [S1](#) Fourier transform on S^1 , Fourier series on $[0, 1]$
 - [S1 abs](#) Functions on S^1 with absolutely converging Fourier series, $\check{I}^1(S^1)$
 - [S1 dist](#) Fourier transform of distributions on S^1
 - [S1 L1toC0](#) $\widehat{} : L^1[0, 1] \rightarrow \mathcal{C}_0(\mathbb{Z}, \mathbb{C})$
 - [S1 L2tol2](#) $\widehat{} : L^2[0, 1] \cong_{\text{Hilb}} l^2(\mathbb{Z}, \mathbb{C})$
 - [subsets](#) Fourier transform of measurable subsets
 - [unsharp](#) Unsharpness principles