Info

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is written (completely with human hands) by Rupadarshi Ray,
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$\widehat{\ }: L^1[0,1] \to \mathcal{C}_0(\mathbb{Z}, \mathbb{C})$

- For $f \in L^1[0,1]$, the Fourier coefficients of f

  $$\hat{f}(n) := \int_{x\in[0,1]} f(x)e^{-2\pi inx}$$

  is bounded

  $$\begin{aligned} \left|\hat{f}(n)\right| &\leq \left|\int_{x\in[0,1]} f(x)e^{-2\pi inx}\right| \\ &\leq \int_{x\in[0,1]} |f(x)| \\ &= \|f\|_1 \end{aligned}$$

  by its L^1-norm.

(Riemann-Lebesgue lemma for Fourier transform on S^1) Let $f \in L^1(S^1)$ then the Fourier coefficients $\hat{f}(k)$ converge to 0 in both $\mathbb{Z}$-directions

$$\hat{f}(k), \hat{f}(-k) \xrightarrow{k\to\infty} 0$$

That is

$$\widehat{\ } : L^1[0,1] \to \mathcal{C}_0(\mathbb{Z}, \mathbb{C})$$

Current note has 0 direct children and 0 total descendants.

- stamp stamp
  - Rf subobjects of and functions on $\mathbb{R}^n, T^n, S^n, \mathbb{C}^n$
    - Fourier

- S1 L1toC0 $\widehat{\ }: L^1[0,1] \to \mathcal{C}_0(\mathbb{Z},\mathbb{C})$

And it has 10 siblings.

- stamp stamp
  - Rf subobjects of and functions on $\mathbb{R}^n, T^n, S^n, \mathbb{C}^n$
    - Fourier
      - L2 bdint Fourier transform on $L^2(-A,A) \leq L^2(\mathbb{R})$
      - L2 Rpos to Hardy2 upper 1 $\widehat{\ }: L^2(0,\infty) \cong_{\mathsf{Hilb}} \mathscr{O}^2(H^2_{\mathrm{U}})$
      - Rn Fourier transform on $\mathbb{R}^n$
      - S1 Fourier transform on S^1, Fourier series on $[0,1]$
      - S1 abs Functions on S^1 with absolutely converging Fourier series, $\check{l}^1(S^1)$
      - S1 dist Fourier transform of distributions on S^1
      - S1 L1toC0 $\widehat{\ }: L^1[0,1] \to \mathcal{C}_0(\mathbb{Z},\mathbb{C})$
      - S1 L2tol2 $\widehat{\ }: L^2[0,1] \cong_{\mathsf{Hilb}} l^2(\mathbb{Z},\mathbb{C})$
      - subsets Fourier transform of measurable subsets
      - unsharp Unsharpness principles