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# Fractional derivative

## Definition. Definition

For any  $s \in \mathbb{R}$  the function

$$\xi \mapsto (1 + |\xi|^2)^{s/2} \in \mathcal{C}^\infty(\mathbb{R}^d)$$

and is *slowly increasing*.

The map

$$\begin{aligned} \Lambda_s : \mathcal{S}^\star &\rightarrow \mathcal{S}^\star \\ f &\mapsto ((1 + |\xi|^2)^{s/2} \hat{f})^\vee \end{aligned}$$

is a linear homeomorphism with inverse  $\Lambda_{-s}$ .

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