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Nonclassical Interpolation Theorems in Spaces of Smooth Functions

The couple of spaces consisting of the space of bounded measurable functions and the space of functions with bounded generalized derivative on the real axis has not been studied extensively from the point of interpolation theory. The main results of the given work are interpolation theorems which extend the list of interpolation spaces for this couple. It turns out that the Triebel–Lizorkin spaces $F^{\theta}_{\infty,p}(\mathbb{R})$ for $0 < \theta < 1$ and $1 \leq p \leq \infty$ are interpolation spaces for this couple, and they are obtained by methods different from the real or complex interpolation methods.
These results come closer to answering the long standing problem of description of the complex method space between spaces of continuous and Lipschitz functions.