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Fractional integro-differentiation in harmonic mixed norm spaces on a half-space

Abstract: In this paper some embedding theorems related to fractional integration and differentiation in harmonic mixed norm spaces $h(p, q, \alpha)$ on the half-space are established. We prove that mixed norm is equivalent to a "fractional derivative norm" and that harmonic conjugation is bounded in $h(p, q, \alpha)$ for the range $0 < p \leq \infty$, $0 < q \leq \infty$. As an application of the above, we give a characterization of $h(p, q, \alpha)$ by means of an integral representation with the use of Besov spaces.