GENERALIZED FRACTIONAL MAXIMAL FUNCTIONS IN LORENTZ SPACES

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Abstract. In this paper we give the complete characterization of the boundedness of generalized fractional maximal operator

\[ M_{\phi, \Lambda^{\alpha}(b)} f(x) := \sup_{Q \ni x} \frac{\| f \chi_{Q} \|_{\Lambda^{\alpha}(b)}}{\phi(|Q|)} \quad (x \in \mathbb{R}^n), \]

between the classical Lorentz spaces \( \Lambda^p(v) \) and \( \Lambda^q(w) \), as well as between \( \Lambda^p(v) \) and weak-type Lorentz spaces \( \Lambda^{p, \infty}(v) \) and \( \Lambda^{q, \infty}(w) \), and between \( \Lambda^p(v) \) and \( \Lambda^q(w) \), for appropriate functions \( \phi \), where \( 0 < p, q, \alpha < \infty \), \( v, w, b \) are weights on \((0, \infty)\) such that \( 0 < B(t) := \int_0^t b \, dt < \infty \), \( t > 0 \), \( B \in \Delta_2 \) and \( B(t)/t^r \) is quasi-increasing for some \( 0 < r \leq 1 \).


Keywords and phrases: Maximal functions, classical and weak-type Lorentz spaces, iterated Hardy inequalities involving suprema, weights.

REFERENCES


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