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Two-weight inequalities for singular integral operators satisfying a variant of Hörmander's condition

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Abstract. In this paper, we present some sufficient conditions for the boundedness of convolution operators that their kernel satisfies a certain version of Hörmander's condition, in the weighted Lebesgue spaces $L_{p,\omega}(\mathbb{R}^n)$.

1. Introduction

Let $\mathbb{R}^n$ be n–dimensional Euclidean space, $x = (x_1, ..., x_n)$, $\xi = (\xi_1, ..., \xi_n)$ are vectors in $\mathbb{R}^n$, $x \cdot \xi = x_1\xi_1 + \ldots + x_n\xi_n$, $|x| = (x \cdot x)^{1/2}$, $\mathbb{R}^n_0 = \mathbb{R}^n \setminus \{0\}$.

Suppose that ω be a positive, measurable, and real function defined in $\mathbb{R}^n$, i.e., is a weight function. By $L_{p,\omega}(\mathbb{R}^n)$ we denote the space of measurable functions $f(x)$ on $\mathbb{R}^n$ with finite norm

$$\|f\|_{L_{p,\omega}(\mathbb{R}^n)} = \left(\int_{\mathbb{R}^n} |f(x)|^p \,\omega(x)dx\right)^{1/p}, \ 1 \le p < \infty.$$