WEIGHTED HARDY–TYPE INEQUALITIES IN ORLICZ SPACES

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Abstract. For a given \( N \)-function \( M \), and inner and outer weight functions \( \omega, e^{-\varphi} \), we obtain Hardy-type inequalities:

\[
\int_a^b M(\omega(r)|u(r)|) e^{-\varphi(r)} dr \leq C \left( \int_a^b M(|u(r)|) e^{-\varphi(r)} dr + \int_a^b M(|u'(r)|) e^{-\varphi(r)} dx \right),
\]

holding for every \( u \in \mathcal{R} \), where \( \mathcal{R} \) is a suitable dilation invariant subset of \( W^{1,1}_{loc}(a,b) \), containing \( C_0^\infty(a,b) \). The constant \( C \) above is independent of \( u \). In many cases considered, the set \( \mathcal{R} \) is proven to be maximal possible.


Keywords and phrases: Hardy inequalities, Orlicz-Sobolev spaces, nondoubling measures.

REFERENCES


