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Relations between weighted Orlicz and BMO_ϕ spaces through fractional integrals

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Abstract: We characterize the class of weights, invariant under dilations, for which a modified fractional integral operator I_α maps weak weighted Orlicz$-\phi$ spaces into appropriate weighted versions of the spaces BMO_ψ, where $\psi(t) = t^{\alpha/n}\phi^{-1}(1/t)$. This generalizes known results about boundedness of I_α from weak L^p into Lipschitz spaces for $p > n/\alpha$ and from weak $L^{n/\alpha}$ into BMO. It turns out that the class of weights corresponding to I_α acting on weak$-L_\phi$ for ϕ of lower type equal or greater than n/α, is the same as the one solving the problem for weak$-L^p$ with p the lower index of Orlicz-Maligranda of ϕ, namely $\omega^{p'}$ belongs to the A_1 class of Muckenhoupt.

Keywords: theory of weights, Orlicz spaces, BMO spaces, fractional integrals
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