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Uniform convexity of paranormed generalizations of L^p spaces

The results presented in the talk have been obtained jointly with Janusz Matkowski (Zielona Góra, Poland). Given a measure space (Ω, Σ, μ) and a bijective increasing function $\varphi : [0, \infty) \to [0, \infty)$ the formula $\mathbf{p}_\varphi(x) = \varphi^{-1}\left(\int_\Omega \varphi \circ |x|\, d\mu\right)$ defines the L^p-like paranorm on the linear space S of μ-integrable simple functions $x : \Omega \to \mathbb{R}$. Main results give general conditions under which this space is uniformly convex. The classical Clarkson theorem on the uniform convexity of L^p-space (see [1]) is generalized. Under some specific assumptions imposed on φ we give not only theorems on the uniform convexity but also formulas of modulus of convexity.

Reference

1. A. Clarkson, *Uniformly convex spaces*, Trans. Amer. Math. Soc. 40 (1936), 396-414.