Rademacher functions in weighted Cesàro spaces

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Abstract: The behaviour of the Rademacher series $\sum a_k r_k$ has been thoroughly studied in a range of function spaces. For $1 \leq p < \infty$, the classical Khintchine inequality states that $\|\sum a_k r_k\|_{L^p} \asymp \|(a_k)\|_2$. Rodin and Semenov characterized those rearrangement invariant spaces X such that $\|\sum a_k r_k\|_X \asymp \|(a_k)\|_2$.

S. V. Astashkin and L. Maligranda have studied in 2010 the case of the Cesàro function spaces $\mathrm{Ces}(p)$:

$$\|f\|_{\mathrm{Ces}(p)} = \Big(\int_0^1 \Big(\frac{1}{x} \int_0^x |f(t)|dt \Big)^p dx \Big)^{1/p}.$$

We study, for $\omega(x)$ a positive weight, the span of the Rademacher functions in the weighted Cesàro spaces,

$$\|f\|_{\mathrm{Ces}(\omega,p)} = \Big(\int_0^1 \Big(\frac{1}{\omega(x)} \int_0^x |f(t)|dt \Big)^p dx \Big)^{1/p}.$$

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References

[1] J. Carrillo-Alanís, *Rademacher functions in weighted Cesàro spaces*, Studia Math., **217**(1) (2013).