ℓ_p-SUBSPACES IN SEQUENTIAL LORENTZ-ORLICZ SPACES AND SIMILAR SPACES

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ABSTRACT. *(Joint work with Anna Kamińska, University of Memphis).* A classical result by Altschuler, Casazza and Bohr-Luh Lin states that every infinite dimensional subspace of the Lorentz sequence space $d(w,p)$ (associated with a decreasing weight on $\mathbb{N}$) contains a further subspace almost isometric to ℓ_p. The aim of the talk is to present analogous results in the case of Orlicz-Lorentz spaces. Such spaces appear as examples of Calderón-Lozanovski intermediate spaces (between ℓ_∞ and the usual Lorentz space $d(w,1)$) If the Orlicz function φ satisfies a Δ_2-condition at zero, we show that the Orlicz-Lorentz sequence space $d(w,\varphi)$ contains an $(1+\epsilon)$-isomorphic copy of ℓ_p, $1 \leq p < \infty$, if and only if the Orlicz sequence space ℓ_φ does, that is if $p \in [\alpha_\varphi, \beta_\varphi]$, where α_φ and β_φ are the Matuszewska-Orlicz lower and upper indices of φ, respectively. If φ does not satisfy the Δ_2-condition, then a similar result holds true for the order continuous subspaces $d_0(w,\varphi)$ and h_φ of $d(w,\varphi)$ and ℓ_φ, respectively. This result sounds at first glance somewhat surprising, insofar the set of exponents p for which $d(w,\varphi)$ contains ℓ_p does not depend on the weight w, contrary to other geometric characteristics.

The results can be extended to similar spaces, in particular $d(w,\varphi)$ where w is not necessarily decreasing.