A CHARACTERIZATION OF OPERATORS WITH p-SUMMING ADJOINT VIA p-LIMITED SETS

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A subset A of a Banach space X is limited if and only if for every weak* null sequence (x_n^*) in X^* there exists a sequence $(\alpha_n) \in c_0$ such that $|\langle x_n^*, x\rangle| \leq \alpha_n$ for all $x \in A$ and $n \in \mathbb{N}$. As an extension of this notion, a subset A of a Banach space X is said to be p-limited ($p \in [1, \infty)$) if for every weakly p-summable sequence (x_n^*) in X^* there exists $(\alpha_n) \in \ell_p$ such that $|\langle x_n^*, x\rangle| \leq \alpha_n$ for all $x \in A$ and $n \in \mathbb{N}$ [2]. Some basic properties related to this notion are showed as well as its connections with (different forms of) compactness. As an application, we give a characterization of operators with p-summing adjoint as those mapping relatively compact sets to p-limited sets.

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References

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