WEAK IDEAL CONVERGENCE IN BANACH SPACES

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[Joint work with Z.H. Yaman.]

In this paper we introduce a notion of weak ideal convergence and weak ideal Cauchy sequences for every continuous linear functional f on a Banach space X. A Banach space is finite-dimensional if and only if every weakly ideal null $X-$ valued sequence has a bounded subsequence. Weak ideal Cauchy sequences are the same as weakly ideal convergent sequences in a reflexive space. We consider an ideal $\mathcal{I}$ in $\mathbb{N}$ i.e., a collection of parts in $\mathbb{N}$ which is closed with respect to set union: $A, B \in \mathcal{I} \Rightarrow A \cup B \in \mathcal{I}$ and hereditary: $B \subseteq A \in \mathcal{I} \Rightarrow B \in \mathcal{I}$, and which is admissible and proper. Also the filter associated with an ideal $\mathcal{I}$ defined by $\mathcal{F}(\mathcal{I}) = \{M \subseteq \mathbb{N} \mid \mathbb{N}\backslash M \in \mathcal{I}\}$.

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