UNCONDITIONAL IDEALS OF COMPACT OPERATORS

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The subspace $\mathcal{K}(X,Y)$ of compact operators from a Banach space X to a Banach space Y is called an *ideal* in the Banach space $\mathcal{L}(X,Y)$ of all bounded linear operators if there exists a norm one projection P on $\mathcal{L}(X,Y)^*$ with $\ker P = \mathcal{K}(X,Y)^\perp$. Moreover, if the projection P satisfies $\|I_{\mathcal{L}(X,Y)^*} - 2P\| = 1$, where $I_{\mathcal{L}(X,Y)^*}$ denotes the identity operator of $\mathcal{L}(X,Y)^*$, then $\mathcal{K}(X,Y)$ is a *u-ideal* (or in longer, *unconditional ideal*) in $\mathcal{L}(X,Y)$.

In [CK] P. G. Casazza and N. J. Kalton prove the following result.

Theorem. *Let X be a separable reflexive Banach space with the approximation property. Then $\mathcal{K}(X,X)$ is a u-ideal in $\mathcal{L}(X,X)$ if and only if X has the unconditional metric approximation property.*

We generalize the result and view different criteria for compact operators to form u-ideals in the space of continuous linear operators. Also, we show that u-ideals of compact operators are separably determined.

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References

[CK] P. G. Casazza and N. J. Kalton, *Notes on approximation properties in separable Banach spaces*, in: Geometry of Banach Spaces, Proc. Conf. Strobl (1989) (P. F. X. Müller and W. Schachermayer, eds.), London Math. Soc. Lecture Note Series, vol. **158**, Cambridge Univ. Press, 1990, pp. 49–63.

[GKS] G. Godefroy, N. J. Kalton, and P. D. Saphar, *Unconditional ideals in Banach spaces*, Studia Math. **104** (1993), 13–59.

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