Separable determination in Asplund spaces

Marek Cúth

cuth@karlin.mff.cuni.cz

One of the important methods in nonseparable Banach space theory is the "separable reduction". By a separable reduction we usually mean the possibility to extend the validity of a statement from separable spaces to the nonseparable setting without knowing the proof of the statement in the separable case. Experience shows that an optimal method of separable reduction is to construct certain separable subspace of a given non-separable Banach space.

We will show how to handle such a construction using set-theoretical concept of suitable models. We will talk about the method in general and try to explain why this method is very efficient if the space in question is Asplund (i.e. separable subspaces have separable dual). Further, we will show that in Asplund spaces this construction gives not only one subspace, but a "rich family" of them.

All of the above will be presented on a concrete application - namely, we will try to show why (and in what sense) "generalized lushness" is separably determined in Asplund spaces.

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