
Complete sets, Jung constant, centers

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Let X be a real Banach space. We say that a set is complete if the diameter of every superset of it has a larger diameter; when the space is an Euclidean one, these sets coincide with constant width sets, which have been studied since long ago.

A throughout study of complete sets, both in finite and in infinite dimensional Banach spaces, has been accomplished in recent years: among the contributors in the area, we mention J.P. Moreno, R. Schneider, H. Martini. In particular, several results have been given for X the space of continuous functions.

In this talk, we indicate some general facts and some new properties of complete sets. In particular, we study the class of completions for a given set and we discuss some ways to obtain a completion.

There are connections between complete sets and the Jung constant, a number connected with the ratio between (Chebyshev) radii and diameters of sets. Concerning radii, in many classical spaces, but not in all, centers of sets always exist. We consider a few connections among these notions: for example, valuating the Jung constant with complete sets, or the asymmetry of complete sets by using the Jung constant of the space.

We also indicate some problems in the area that, to our knowledge, are open.