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Summary of the PhD thesis entitled
"Diametrically complete set with empty interior"

In my PhD thesis I prove that after a suitable renorming, each infinite-dimensional, reflexive and separable Banach space is locally uniformly rotund and contains a diametrically complete set with empty interior. Next, I extend this result to each reflexive Banach space.

In the second part of my thesis I generalize the result due to E. Maluta and D. Yost who proved that each Banach space X with an unconditional Schauder basis can be renormed in such a way that X with this new norm contains a constant width set with empty interior. Using my generalized result about constant width sets in the Cartesian product of Banach spaces, I can show that after a suitable equivalent renorming the Banach space $C([0,1], R)$ contains a constant width set with empty interior.

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