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Best approximations and porous sets

Comment.Math.Univ.Carolinae 44,4 (2003) 681-689.

Abstract: Let D be a nonempty compact subset of a Banach space X and denote by $S(X)$ the family of all nonempty bounded closed convex subsets of X . We endow $S(X)$ with the Hausdorff metric and show that there exists a set $\mathcal{F} \subset S(X)$ such that its complement $S(X) \setminus \mathcal{F}$ is σ -porous and such that for each $A \in \mathcal{F}$ and each $\tilde{x} \in D$, the set of solutions of the best approximation problem $\|\tilde{x} - z\| \rightarrow \min$, $z \in A$, is nonempty and compact, and each minimizing sequence has a convergent subsequence.

Keywords: Banach space, complete metric space, generic property, Hausdorff metric, nearest point, porous set

AMS Subject Classification: 41A50, 41A52, 41A65, 54E35, 54E50, 54E52