

DISTORTION AND THE STABLE FIXED POINT PROPERTY FOR NONEXPANSIVE MAPPINGS

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ABSTRACT. Let X be Banach space. Following [1], an equivalent norm $||| \cdot |||$ is a distorted norm if there exists $c > 1$ such that for every subspace Y of $(X, ||| \cdot |||)$ and every isomorphism $T : Y \rightarrow X$ we have $|||T||| |||T^{-1}||| > c$. On the other hand, X is said to have the stable fixed point property for nonexpansive mappings if every nonexpansive mapping defined from a convex weakly compact subset C of X into C has a fixed point and this property is inherited for those Banach spaces which are close enough to X in the sense of the Banach-Mazur distance. Even though these notions seem to be quite independent, we will show that there is a strong connection between the distortability of the norm and the possibility of obtaining a renorming with the stable fixed point property.

[1] J. Lindenstrauss, A. Pełczyński, *Contributions to the theory of the classical Banach spaces*, J. Functional Analysis 8 (1971), 225-249.