Small Diameter Properties in Banach spaces

Sudeshna Basu

Loyola University

The geometry of Banach space is an area of research which charecterizes the topological and measure theoretic concepts in Banach spaces in terms of geometric structure of the space. In this work we study three different versions of small diameter properties of the unit ball in a Banach space and its dual. The related concepts for all closed bounded convex sets of a Banach space was initiated developed and extensively studied in the context of Radon Nikodym Property and Krein Milman Property in [1] and developed subsequently. We prove that all these properties are stable under l_p sum for $1 \leq p \leq \infty$, c_0 sum and Lebesgue Bochner spaces. We show that these are three space properties under certain conditions on the quotient space. We also study these properties in ideals of Banach spaces. This is based on two papers jointly written with my graduate student, Susmita Seal [2], [3].

References

[1] N. Ghoussoub , G. Godefroy , B. Maurey, W. Scachermayer; *Some topological and geometrical structures in Banach spaces*, Mem. Amer. Math. Soc. **70** 378 (1987).

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[3] S. Basu, S. Seal, " Small diameter properties in ideals of Banach Spaces" *To appear in Journal of Convex Analysis* **30** (2023), No. 1, Math Archive link, https://doi.org/10.48550/arXiv.2109.04963, 2022.