Summer School 2026

Topics in Banach Space Theory

The Super Alternative Daugavet Property for Banach Spaces

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Abstract

In this talk, we introduce and discuss the super Alternative Daugavet property for Banach spaces [LLMPR], a new isometric property situated between the classical Daugavet property and the Alternative Daugavet property. While the Daugavet property is naturally described through relatively weakly open subsets of the unit ball, replacing slices by such sets in the geometric formulation of the Alternative Daugavet property leads to a genuinely new notion. We say that a Banach space X has the super ADP if for every element x in the unit sphere and every relatively weakly open subset W of the unit ball intersecting the unit sphere, there are an element $y \in W$ and a modulus one scalar θ such that $\|x+\theta y\|$ is almost two. We will provide examples separating these properties and show that the super Alternative Daugavet property shares several geometric features with the Daugavet property: spaces satisfying it have rough norm, fail the convex point of continuity property, and cannot be Asplund. The talk will also address localized versions of these properties, including super alternative Daugavet points, and compare them with Daugavet points, super Daugavet points, and related diametral notions. Finally, we will describe applications to classical constructions, including spaces of vector-valued continuous functions and vector-valued integrable functions. The talk is based on joint work with M. Lõo, M. Martín, Y. Perreau, and A. Rueda Zoca.

[LLMPR] Langemets J, Lõo M, Martín M, Perreau Y, Rueda Zoca A. The super Alternative Daugavet property for Banach spaces. Proceedings of the Edinburgh Mathematical Society. 2026;69(2):471-499. doi:10.1017/S0013091525101168