DEPARTAMENTO DE ANÁLISIS MATEMÁTICO Y MATEMÁTICA APLICADA

Facultad de Ciencias MATEMÁTICAS

Instituto de Matemática Interdisciplinar

SEMINARIO DE ANÁLISIS MATEMÁTICO Y MATEMÁTICA APLICADA

Miguel Martín Suárez
Universidad de Granada

Generating operators between Banach spaces

Motivated by the notion of spear operator, we introduce the weaker concept of generating operator. Given two (real or complex) Banach spaces X and Y, we say that a norm-one (linear) operator $G:X \to Y$ is generating if the equality

$$||T||=\inf_{\{\delta>0\}} \sup \{||Tx|| : x\in X,\ ||x||=1, ||Gx||>1-\delta\}$$

holds for every operator $T:X \to Y$. Equivalently, G is generating if (and only if), for every $0<\delta<1$, the set $\{x\in X : ||x||=1, ||Gx||>1-\delta\}$ generates the unit ball of X by closed convex hull. This class of operators includes isometric embeddings, spear operators, and other examples such as the natural inclusion of into c0.

Along the talk, we will present different characterizations of this type of operators, discuss when they are norm-attaining, and analyze the set of all generating operators between two fixed Banach spaces.

This is based on a joint work with Vladimir Kadets, Javier Merí, and Alicia Quero.

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