Colloquium del Departamento

de Análisis Matemático

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"Almost disjointness and band preserving operators"

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Abstract:

We say that an operator between Banach lattices E and F is disjointness preserving if images of disjoint elements of E are disjoint in F. Further, an operator on a Banach lattice E is band preserving if it maps each band of E into itself, or equivalently, the image of x is disjoint from y whenever x itself is disjoint from y.

We investigate the stability of these properties. More specifically: an operator T between Banach lattices E and F is called c-almost disjointness preserving if $\| \max\{ |Tx|, |Ty| \} \|$ doesn't exceed c whenever x and y are disjoint elements of the unit ball of E. An operator T acting on a Banach lattice E is c-almost band preserving if $\| \max\{ |Tx|, |y| \} \| \leq c$ whenever x is an element of the unit ball of E, disjoint from y. If T is c-almost disjointness preserving (c-almost band preserving), does there exist a disjointness preserving (resp. band preserving) operator S so that $\|T-S\| \leq f(c)$, where f(c) approaches 0 when c does? It turns out that, in general, the answer is negative. However, in many situations, a positive answer has been obtained. Along the way, we obtained some related results (such as automatic continuity). (joint work with P. Tradacete)

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