

Interpolation of entropy numbers by multidimensional methods

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In 1991, Cobos and Peetre [3] introduced interpolation methods for N -tuples of Banach spaces associated to a convex polygon Π in the plane and a point (α, β) in the interior of Π . Using the vertices of Π they defined K - and J -functionals with two parameters and then they introduced K - and J -spaces by means of an (α, β) -weighted L_q -norm. In particular, when Π is equal to the simplex, these methods give back spaces introduced by Sparr [6], and if Π is equal to the unit square they recover spaces studied by Fernandez [4]. An important part of the paper [3] is devoted to investigate the behaviour of compact operators in this multidimensional case. Later Cobos, Kühn and Schonbek [2] continued this research.

In this talk we study how far from being compact an interpolated operator can be. So we establish estimates for the measure of non-compactness of an interpolated operator acting from a J -space into a K -space and acting between two K -spaces. We also derive estimates for entropy numbers if some of the N -tuples reduce to a single Banach space. Finally, as applications of our formulae, we recover the results in [3] and [2] on interpolation of compact operators in the multidimensional case.

This talk is based on the papers [1] and [5].

References

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