

**Cofan, Nicolae; Stan, Ilie****Interpolation of compact operators in the multidimensional case.** (English) Zbl 1170.46021

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Theorems of Krasnosel'skii type, especially Cwikel's result for general Banach spaces, concerning the properties of compact operators acting between Banach spaces under interpolation, are investigated in the multi-dimensional case. The objects of study are  $(n+1)$ -tuples  $\bar{A} = (A_0, A_1, \dots, A_n)$  of Banach spaces  $A_i$  which are continuously embedded in a Hausdorff space  $\mathcal{U}$ , and, for two such  $(n+1)$ -tuples  $\bar{A}, \bar{B}$ , maps  $T : \bar{A} \rightarrow \bar{B}$ , whose restrictions to the  $A_i$  are continuous homomorphisms into  $B_i$ , the  $i$ -th member of  $\bar{B}$ . Analogues of Peetre's  $K$ - and  $J$ -functionals are defined, and the  $K$  and  $J$  real interpolation methods of Sparr, Fernandez and of Cobos-Peetre [cf. *F. Cobos* and *J. Peetre*, Proc. Lond. Math. Soc. 63, 371–400 (1991; Zbl 0702.46047)] are presented in this multi-dimensional setting. These methods are then used, in turn, to examine the validity of Cwikel's theorem. The behaviour of the measure of non-compactness of the map  $T$  under real interpolation is also investigated by Sparr's methods.

Reviewer: **W. D. Evans** (Cardiff)**MSC:**

- 46B70 Interpolation between normed linear spaces
- 46M35 Abstract interpolation of topological vector spaces
- 46B50 Compactness in Banach (or normed) spaces
- 47H09 Contraction-type mappings, nonexpansive mappings,  $A$ -proper mappings, etc.
- 47B07 Linear operators defined by compactness properties

**Keywords:**real interpolation; Peetre's  $K$ - and  $J$ -functionals; Krasnosel'skij-type theorems; compact operator; measure of noncompactness