

Interpolation of measure of weak noncompactness by real and complex methods for finite families of Banach spaces

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ABSTRACT

Logarithmically convex-type estimates of a measure of weak noncompactness for bounded linear operators under real and complex interpolation for finite families of Banach spaces are established. We deal with the real method of Yoshikawa (equivalent to Sparr's K -method) and the complex method of Krein and Nikolova in the case of finite families of spaces. The obtained results can be regarded as a quantitative version for weakly noncompact operators of the following: if one of operators $T : A_i \rightarrow B_i$, $i = 0, \dots, n$ is weakly compact, then so is each operator $T : A_{\theta,p} \rightarrow B_{\theta,p}$, $0 < \theta < 1 < p < \infty$ and $T : A_{[\theta]} \rightarrow B_{[\theta]}$, $|\theta| < 1$, where, respectively, $A_{\theta,p}$, $B_{\theta,p}$ and $A_{[\theta]}$, $B_{[\theta]}$ are the real and the complex interpolation spaces with respect to $(n+1)$ -tuples (A_0, \dots, A_n) , (B_0, \dots, B_n) of compatible Banach spaces. The measure of weak noncompactness used here is a counterpart in the weak topology of the separation measure of noncompactness and is not equivalent to De Blasi's measure of weak noncompactness.

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