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Logarithmic interpolation methods: the limiting cases

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Interpolation theory plays an important role in the study of function spaces, operator theory and other areas of mathematics. Many of these applications are based on the real method $(A_0, A_1)_{\theta,q}$ introduced by Lions and Peetre (see [1]), where $0 < \theta < 1$.

Logarithmic methods $(A_0, A_1)_{\theta,q,\mathbb{A}}$, defined by means of a broken logarithmic function $\ell^{\mathbb{A}}(t)$, are an important extension of the real method such that, under certain additional assumptions, θ can also take the values 0 and 1. In this talk we will be interested in the limiting cases where $\theta = 0$ or 1, since there were certain natural questions about these spaces that had not been studied before. In particular, we will show that the description of these spaces in terms of the J-functional depends on the relationship between q and $\mathbb{A}$, contrary to the case where $0 < \theta < 1$. As a consequence of these J-descriptions, we will be able to investigate the behaviour of compact and weakly compact operators under logarithmic interpolation methods. The contents of this talk are part of a joint work with Fernando Cobos ([2]).

Referencias

[1] Bergh, Jöran; Löfström, Jörgen; *Interpolation spaces. An introduction.* Grundlehren der Mathematischen Wissenschaften, No. 223. Springer-Verlag, Berlin-New York, 1976.

[2] Cobos, Fernando; Segurado, Alba; Description of logarithmic interpolation spaces by means of the J-functional and applications. *J. Funct. Anal.* **268** (2015), 2906–2945.

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