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Interpolation of Banach spaces. (English) [Zbl 1041.46012](#)

Johnson, W. B. (ed.) et al., Handbook of the geometry of Banach spaces. Volume 2. Amsterdam: North-Holland (ISBN 0-444-51305-1/hbk). 1131-1175 (2003).

With this survey, the authors do not try to cover as many of the numerous topics occurring in interpolation theory as possible within the limited space presumably offered by the editors. Instead, they concentrate on the interaction between interpolation theory and the geometry of Banach spaces, provide many proofs or sketches thereof, and supplement their exposition by historical remarks and an extensive list of references.

After introducing the real and the complex methods of interpolation, the authors consider properties preserved by interpolation. They discuss the classical problem of compactness of operators more detailed, and describe an abstract approach for general properties involving the Kadets distance. The topic of Calderón couples is closely investigated in Section 6, spanning from the work of Cwikel and Brudnyi, Kruglyak on the K -divisibility principle to more recent work of the first named author on characterizations of Calderón couples. An extension of Boyd's theorem on interpolation spaces for the couple (L_p, L_q) proved recently by the authors is given in Section 7.

The remaining sections are devoted to developing differential methods in interpolation theory, initiated by Rochberg and Weiss, and relevant to the constructions of twisted sums of Banach spaces, a topic also covered in another article in the Handbook by the first-named author [ibid. 1039–1130 (2003; [Zbl 1059.46004](#))]. The authors consider self-extensions of Hilbert spaces, analytic families of Banach spaces, entropy functions of Banach sequence spaces, and commutator estimates.

For the entire collection see [[Zbl 1013.46001](#)].

Reviewer: [Carsten Michels \(Oldenburg\)](#)

MSC:

- [46B70](#) Interpolation between normed linear spaces
- [46M35](#) Abstract interpolation of topological vector spaces
- [46-00](#) General reference works (handbooks, dictionaries, bibliographies, etc.)
pertaining to functional analysis

Cited in **28** Documents

Keywords:

[interpolation of Banach spaces](#); [Calderón couples](#); [twisted sums](#); [commutator estimates](#)