

Index

- absolutely p -summing operator, 231
 absolutely 2-summing norm, 232
 absolutely 2-summing operator, 229, 231, 234
 absolute value of an operator, 116
 abstract kernel, 161, 226, 227
 adjoint and self-adjoint operator, 115, 116
 algebraic tensor product, 259
 approximable operator, 46
 approximation numbers
 local, 89, 168
 local symmetrized, 94
 of a function, 160
 of an operator, 41
 symmetrized, 82
 Arzelà–Ascoli theorem, 175
 Auerbach basis, 44
 Auerbach’s lemma, 43
- ball, 249
 Banach algebra, 134
 Banach–Mazur distance, 106, 229
 Banach space
 bidual of, 75
 dual, 3
 metric extension property of a, 59
 metric lifting property of a, 51
 of bounded number families, 60
 of Hölder continuous functions, 179
 of summable number families, 51
 reflexive, 75
 Bernstein’s inequality for functions, 95
 Bernstein type inequality for operators, 96, 230
 bidual operator, 76
 Borel measure, 213
 Borel set, 213
 Borel σ -algebra, 212
 bounded subset, 6
- Calkin algebra, 133
 canonical embedding, 4, 75
 canonical factorization of an operator, 2
 canonical surjection, 3
 Cantor’s ternary set, 194
 classical spectral radius formula, 138
- convex hull, 245
 volume of a, 245
 coset, 3
 covering, 6
- degree of approximation, 178
 degree of compactness, 178
 diagonal operator, 16
 Dirac functional, 226
 distance, local injective and surjective, 106
 distance of a point from a subset, 162
- ε -chain, 189
 ε -net, 6
 eigenvalue, 130
 algebraic and geometric multiplicity
 of an, 131
 sequence, 4, 137
 eigenvector, 131
 ellipsoid, 250
 entropy function, 8
 entropy moduli, 10, 12
 entropy numbers, 7, 11
 dyadic and inner dyadic, 21
 inner, 7, 11
 outer, 13
 equicontinuity, 176
 equivalent quasi-norm, 4
 essential spectral radius, 134
 essential spectrum, 134
 extension of an operator, 63
 extension constant, 63, 65
 extension property of a Banach space,
 metric, 59
- factorization theorem for absolutely-2
 summing operators, 231
 finite-dimensional operator, 2
 finite-dimensional subspace,
 geometrical properties of a, 162
 finite rank operator, 2
 Fredholm operator, 133
 functional, 2
- Gelfand numbers, 56
 local, 90
 injectivity of, 61

- generalized sequence, 87
 generalized integral operator, 161
 generating kernel, 214
 generating operator, 198
 geometrical parameter, 63
 geometrical properties of
 finite-dimensional subspaces, 162
 Grothendieck's theorem, 230, 264
 Grothendieck's inequality, 254, 264
- Hahn–Banach theorem, 4
 Hardy's inequality, 31
 Hölder classes of continuous functions, 160
 Hölder continuous function of type α , 179
 Hölder continuous operator of type α , 196
 Hölder continuous Z -valued function
 of type α , 225
- ideal quasi-norm, 37
 injective and surjective, 39
 identity map I_∞ , 180
 integrable function, 213
 integral operator, 161, 212, 221
 generalized, 161
 isomorphic Banach spaces, 1
 isomorphism, 1
 iterated kernel, 131
- Jackson's inequality for functions, 96, 160
 Jackson type inequality for operators, 101
- kernel, 2
 abstract, 161, 226
 generating, 214
 modulus of continuity of a, 215
 operator defined by an abstract, 225, 227
 Khintchin's inequality, 254, 255
 Kolmogorov numbers, 49
 local, 91
 surjectivity of, 53
- Lebesgue measure, 9
 lifting, 51, 68
 lifting constant, 68, 70, 240
 $\mathcal{L}_{\infty, \lambda}$, $\mathcal{L}_{1, \lambda}$ -space, 162
 local approximation numbers, 89, 168
 local Gelfand numbers, 90
 local injective and surjective distance, 106
 local Kolmogorov numbers, 91
 local quantities, 85
 local reflexive, 75
 Lorentz sequence spaces, 37
 lexicographical order of, 29
- μ -equivalent measurable functions, 213
 μ -essential bounded, 213
 μ -essential supremum, 213
 μ -null set, 213
- measurable function and set, 213
 measures of non-approximation and
 non-compactness, 124
 metric injection and surjection, 12, 13
 metric lifting and extension property, 51, 59
 metric space, connected and
 ε -connected, 188, 189
 modulus of continuity, 95, 96, 160, 161
 of a kernel, 215
 of a Z -valued function, 225
 of an operator, 174, 178
 surjectivity of the, 175
- 2-nuclear norm and operator, 236
 null space, 2
- operator, 1, 11
 absolutely-summing, 229, 231, 234
 absolute value of an, 116
 adjoint and self-adjoint, 115, 116
 ascent of an, 131
 canonical factorization of an, 2
 compact, 159
 dual, 72
 finite rank (finite-dimensional), 2
 Fredholm, 133
 generating, 198
 Hilbert-Schmidt, 231
 Hölder continuous, 196
 ideal, 37: injective and surjective, 39;
 injective and surjective hull, 54, 62;
 quasi-normed and complete
 quasi-normed, 37
 induced, 2, 3
 integral (generalized integral), 161,
 212, 221
 modulus of continuity of an, 174, 178
 norm, 2
 nuclear, 236
 of type A , 37
 polar decomposition of an, 117
 positive (root of a positive), 116
 resolvent and spectrum of an, 130, 134
 Riesz, 134
 spectral radius of an, 130, 134
- packing, 1
 functions subordinate to a, 181
 partial isometry, 117
 partition of unity, 162, 163, 200
 subordinate to an open covering, 163
 Pisier's theorem, 250
 polar decomposition of an operator, 117
 polar set, 249
 positive (and root of a positive)
 operator, 116
 precompact, 8
 principal vector, 132

Cambridge University Press

978-0-521-09094-0 - Entropy, Compactness and the Approximation of Operators

Brend Carl and Irmtraud Stephani

Index

[More information](#)*Index*

277

- principle of local reflexivity, 75, 76
- projection, 42
 - spectral, 132
- projection constant, 229, 239
 - relative, 64, 239
- quasi-norm
 - equivalent, 4
 - injective and surjective, 39, 40
- quasi-normed operator ideal, 37
 - complete, 39
- quotient map, 3, 49
- quotient norm, 49
- quotient space, 2, 49
- ρ -distant set, 6
- range, 2
- resolvent set, 130, 134
- Riesz operator, 134
- Santalò inequality, 230, 253
 - inverse of, 230, 253
- Schauder's theorem, 84
- Schmidt's representation theorem, 46
- semi-norm, 214
- singular numbers, 155
- spectral projection, 132
- spectral radius, 130, 134
 - classical, 138
 - essential, 134
 - formula, 148
- spectrum, 130
 - essential, 134
- support of a function, 162
- symmetric subset, 249
- symmetrized approximation numbers, 82
 - local, 94
- tensor product
 - algebraic, 259
 - of operators, 260
- universality of the Banach space
 - $C[a, b]$, 159
- universality of $C[a, b]$ -valued compact operators, 159
- volume of a convex body, 230
- volume of a convex hull, 230
- volume ratio, 230
- Weyl's inequalities, 157
- Weyl type inequality, 146