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List of Symbols

\preceq	Dominated by, page 156
\ll	Strongly dominated by, page 168
\cong	Equivalent in terms of domination, page 156
\nearrow	Limit of an increasing sequence, page 15
$\overline{A}^{\ \cdot\ _X}$	Closure of $A \subset X$ with respect to the norm $\ \cdot\ _X$, page 12
$\subset\subset$	$A \subset\subset E$ if $\overline{A} \subset E$ is compact, page 10
$\rightarrow b^+$	Tends to b from above, page 22
$\rightarrow b^-$	Tends to b from below, page 22
$2B$	Ball with same center as B but twice the diameter, page 10
$2Q$	Cubes with same center as Q but twice the diameter, page 10
A°	Annihilator of set A , page 65
\mathcal{A}	Class \mathcal{A} ; generalization of Muckenhoupt class, page 117
\mathcal{A}_∞	Class \mathcal{A}_∞ ; generalization of Muckenhoupt class A_∞ , page 159
\mathcal{A}_{loc}	Class \mathcal{A}_{loc} ; generalization of Muckenhoupt class, page 117
A_q	Class of Muckenhoupt A_q weights, page 149
$(a, b), [a, b]$	Open/closed segment connecting a and b , page 10
B	Open ball, page 10
BMO	Functions with bounded mean oscillation, page 144
$B^n(x, r)$	N-dimensional ball, page 370
$B_{p,q}^\alpha$	Besov space, page 393
$B(x, r)$	Open ball with center x and radius $r > 0$, page 10
$\tilde{C}_{p(\cdot)}$	Sobolev capacity based on quasicontinuous functions, page 342
$C_{p(\cdot)}$	Sobolev capacity, page 315
$\text{cap}_{p(\cdot)}$	Relative/variational capacity, page 322
$\text{cen}(Q)$	Center of Q , page 145
χ_E	Characteristic function of the set E , page 13
C^∞	Smooth functions, page 15
C_0^∞	Smooth functions with compact support, page 15
$C_{0,0}^\infty$	Compactly supported smooth functions with vanishing integral, page 91
$c_{\log}(p)$	log-Hölder constant of $\frac{1}{p}$, page 101
$D^{k,p(\cdot)}$	Homogeneous Sobolev space, page 379

$D_0^{k,p(\cdot)}$	Homogeneous Sobolev space with zero boundary values, page 379
$D^{-k,p(\cdot)}$	Dual space of $D_0^{k,p'(\cdot)}$, page 384
D'	The space of distributions, page 17
E^φ	Set of finite elements of L^φ , page 49
e_Q	Special function on family of cubes, page 151
F	Closed set in a topological space, page 10
$\mathcal{F}f$	Fourier transform, page 368
\widehat{f}	Fourier transform, page 368
$F_{P(\cdot),q(\cdot)}^{\alpha(\cdot)}$	Triebel–Lizorkin space, page 394
$f_{P(\cdot),q(\cdot)}^{\alpha(\cdot)}$	Discrete Tribel–Lizorkin space, page 394
$F_{P,q}^\alpha$	Tribel–Lizorkin space, page 393
\mathcal{G}	Class \mathcal{G} ; to pass from single cubes to families, page 223
g_α	Bessel kernel, page 388
$H_0^{k,p(\cdot)}$	Closure of C_0^∞ -functions in $W^{k,p(\cdot)}$, page 346
$\mathbb{R}_>^n, \mathbb{R}_<^n$	Open upper/lower half-space, page 10
$\mathbb{R}_\geq^n, \mathbb{R}_\leq^n$	Closed upper/lower half-space, page 10
\mathcal{H}^s	Hausdorff s -measure, page 334
$\mathcal{H}^{s(\cdot)}$	Variable dimension Hausdorff measure, page 335
I_α	Riesz potential operator, page 199
$\text{Im}(V)$	Image of operator V , page 65
J_g	Natural embedding from L^{φ^*} and $(L^\varphi)'$ into $(L^\varphi)^*$, page 59
\mathbb{K}	Either \mathbb{R} or \mathbb{C} , page 21
K	Compact set in a topological space, page 10
$\ker(V)$	Kernel of operator V , page 65
L_{loc}^1	Space of locally integrable functions, page 14
L^0	The set of all measurable functions, page 22
L^φ	Musielak–Orlicz space, page 38
L_{OC}^φ	Musielak–Orlicz class, page 48
$\mathcal{L}^{\alpha,p(\cdot)}$	Bessel space, page 388
$L_0^{p(\cdot)}$	Lebesgue functions with vanishing integral, page 91
$l^{p(\cdot)}$	Variable exponent Lebesgue sequence space, page 84
$l^\psi(Q)$	Musielak–Orlicz (sequence) space with measure $ Q $, page 151
$L_*^{p(\cdot)}$	Modified Lebesgue space, page 285
L^s	Classical Lebesgue space, page 14, 15
$M_s f$	L^s -maximal function, page 206
$M^\sharp f$	Sharp function, page 206
M_{center}	Centered maximal function, page 118
M^Δ	Dyadic maximal function, page 162
Mf	Maximal function, page 111
M_φ	φ -average maximal operator, page 228
$M_{p(\cdot),Q}$	$L^{p(\cdot)}$ -average operator over single cube, page 228
$M_{\varphi,Q}$	φ -average operator over Q , page 227
$M_Q\varphi$	Average of generalized Φ -function over Q , page 151

$M_Q f$	Average of $ f $ over Q , page 111
$M_{s,Q} \varphi$	L^s -average of generalized Φ -function over Q , page 151
$M_{s,Q} f$	s -average of function over Q , page 111
$N(A, \mu)$	Set of N -functions, page 43
$N(\Omega)$	Set of N -functions, page 43
\mathbb{N}_0	Natural numbers including zero, page 237
Ω	Open set in \mathbb{R}^n , page 10
$\mathcal{P}(A, \mu)$	Set of variable exponents, page 69
$\mathcal{P}(\Omega)$	Set of variable exponents, page 69
\mathcal{P}^{\log}	Variable exponents p such that $\frac{1}{p}$ is log-Hölder continuous, page 101
$p^\#$	Sobolev conjugate for smoothness α , page 200
p'	Dual exponent, page 69
p^*	Sobolev conjugate $p^*(x) := \frac{np(x)}{n-p(x)}$, page 265
p^+, p^-	Essential supremum and infimum of p , page 69
p_A^+, p_A^-	Essential supremum and infimum of p in A , page 69
p'_E	Dual of harmonic mean, page 123
$\Phi(A, \mu)$	Generalized Φ -functions, page 36
$\Phi(\Omega)$	Generalized Φ -functions, page 36
$\Phi(\mathcal{Q})$	Generalized Φ -functions on locally 1-finite family of cubes, page 151
φ	Φ -function, page 34
φ^*	Conjugate Φ -function of φ , page 52
φ^{-1}	Left-continuous inverse, page 72
φ_p	Φ -function defining L^p , page 70
φ_∞	Φ -function defining L^∞ , page 70
$\bar{\varphi}_{p(\cdot)}$	Generalized Φ -function defining $L^{p(\cdot)}$, page 70
$\tilde{\varphi}_{p(\cdot)}$	Generalized Φ -function defining $L^{p(\cdot)}$, page 70
p_Q	Harmonic mean, page 109
Q	Cube, and generic symbol for cube or ball, page 10
$Q_0^{1,p(\cdot)}$	Quasicontinuous Sobolev functions with zero boundary values, page 348
ϱ	Semimodular; modular, page 22
ϱ^*	Conjugate semimodular of ϱ , page 30
ϱ_φ	Semimodular induced by generalized Φ -function φ , page 37
$R_{p(\cdot)}(K, \Omega)$	Admissible test functions for the relative/variational capacity of (K, Ω) , page 322
\mathbb{R}^n	Euclidean, n -dimensional space, page 10
$\mathbb{R}_{>}^{n+1}$	$\mathbb{R}^n \times (0, \infty)$, page 367
$\mathbb{R}_{<}^{n+1}$	$\mathbb{R}^n \times (-\infty, 0)$, page 370
S	Simple functions, page 37
S_c	Simple functions with compact support, page 79
\mathcal{S}	Schwartz class, page 368
sgn	The sign of the argument, page 60

$\tilde{S}_{p(\cdot)}(E)$	Admissible test functions for the quasicontinuous Sobolev capacity of E , page 342
$S_{p(\cdot)}(E)$	Admissible test functions for the Sobolev capacity of E , page 315
T_ε	Truncation of the operator T , page 209
T^*	Maximal truncated (singular integral) operator, page 212
$T_{\varphi, \mathcal{Q}}$	φ -average operator over cube family, page 227
$T_{p(\cdot), \mathcal{Q}}$	$L^{p(\cdot)}$ -average operator over cube family, page 228
T_k	Averaging operator over dyadic cubes, page 200
$T_{\mathcal{Q}}$	Averaging operator, page 116
$\text{Tr } X$	Trace of X , page 369
$\text{Tr } D^{1,p(\cdot)}$	Trace space, page 381
$\text{Tr } W^{k,p(\cdot)}$	Trace space, page 369
U, V	Open sets in a topological space, page 10
$W_{\text{loc}}^{k,1}$	Space of local $W^{k,1}$ functions, page 15
$W^{k,p(\cdot)}$	Sobolev space, page 248
$W_0^{k,p(\cdot)}$	Sobolev space with zero boundary values, page 251
$W^{-k,p(\cdot)}$	Dual space of $W_0^{k,p'(\cdot)}$, page 384
$W^{k,s}$	Classical Sobolev space, page 14
$w\text{-}L^q$	Weak L^q , page 111
X_ϱ	Semimodular space or modular space, page 24
\mathcal{X}^n	Set of all open cubes in \mathbb{R}^n , page 156
\mathcal{Y}_1^n	Set of locally 1-finite family of cubes in \mathbb{R}^n , page 151

Index

- \mathcal{A} -constant, 117
- A-solution, 421
- A-subsolution, 421
- A-supersolution, 421
- Absolutely continuity
 - on lines, 345
- Absolutely continuous norm, 50, 62
- ACL, 345
- Admissible
 - for Triebel–Lizorkin space, 393
 - for capacity, 315, 322
- Almost everywhere, 13
- Associate space, 58, 78
- Averaged Taylor polynomial, 278
- Averaging operator
 - $M_Q f$, 111
 - T_k , 200
 - $T_{p(\cdot), \mathcal{Q}}$, 228
 - $T_{\mathcal{Q}}$, 116
 - $T_{\varphi, \mathcal{Q}}$, 227
- Banach couple, 213
- Banach function space, 61, 78
- Banach space, 11, 38, 248, 251, 346
- Banach–Saks property, 250
- Bell shaped, 128
- Bessel
 - kernel, 388
 - space, 388
- Biconjugate semimodular, 31
- Bilipschitz, 305
- Boman chain condition, 239
- Bounded mapping, 11
- Bounded mean oscillation, 144
- Caccioppoli estimate, 429
- Calderón–Zygmund decomposition, 194
- Calderón–Zygmund operator, 208, 461
- Capacitable set, 319
- Capacity
 - Choquet, 319, 320, 328
 - of a ball, 328, 329
 - outer, 317
 - quasicontinuous, 342
 - relative, 322
 - Sobolev, 315
 - variational, 322
- Carathéodory function, 414
- Circular, 41, 61, 77
- Class \mathcal{A} , 117, 217
- Class \mathcal{A}_{loc} , 117
- Class \mathcal{G} , 223
- Closure, 12
- Compact embedding, 218
- Compact support, 15
- Completeness, 38
- Condenser, 322
- Condition (D'), 461
- Condition (D), 210
- Cone condition, 300
- Conjugate
 - Φ -function, 52
 - semimodular, 30
- Continuous modular, 22
- Convergence
 - in measure, 15
 - in norm, 25
 - modular, 26
 - strong, 12, 25
 - weak, 12, 32
- Convolution, 94
- Covering theorem
 - basic, 13
 - Besicovitch, 14

- Δ_2 -condition
 - for Φ -function, 42
 - for modular, 42, 43
 - weak for modular, 26
- Decomposition theorem, 240
- Density
 - of bounded functions, 290
 - of compactly supported functions, 290
 - of continuous functions, 305
 - of Lipschitz functions, 310
 - of Schwartz functions, 390
 - of smooth functions, 90, 130, 289, 395
- Dini–Lipschitz, 100
- Discontinuous exponent, 299
- Discrete Lebesgue spaces, 114
- Distribution, 17
- Distributional derivative, 17
- Divergence equation, 459, 466
- Domain, 10
 - (ε, ∞) , 276
 - Boman chain, 239
 - emanating chain, 238
 - John, 237
 - Jones, 276
 - Lipschitz, 237
 - uniform, 276
 - with $C^{k,\lambda}$ -boundary, 237
 - with fat complement, 310
- Dominated, 156
- Dominated convergence, 16, 40, 77
- Doubling measure, 13
- Dual exponent, 15
- Dual space, 11, 383
- Dyadic cube, 162, 277
- Dyadic maximal function, 162

- Eigenvalues, 402
- Emanating chain condition, 238
- Embedding between Lebesgue spaces, 82
- Equi-integrable, 16
- Existence of solutions, 402, 418
- Existence of solutions, 405, 412
- Extension domain, 276, 282, 292
- Extension of exponent, 102
- Extension operator, 276, 278, 282
- Extrapolation
 - application of, 276, 395
- Extrapolation theorem, 218

- Fat complement, 349
- Fat complement, 310
- Fatou property, 41, 61, 77

- Fatou’s lemma, 16
 - for the modular, 40, 77
 - for the norm, 41, 77
- Fourier transform, 368
- Fundamental solution, 455
 - Poisson problem, 438
 - Stokes problem, 447

- \mathcal{G} -constant, 223
- Generalized Orlicz space, 38
- Generalized Φ -function, 36
 - proper, 61, 78

- Hardy’s inequality, 247
- Hardy–Littlewood maximal operator, 111
- Harmonic mean, 109
- Harmonic mean p_Q , 109
- Harnack’s inequality, 419, 436
 - a counter example, 410
 - for quasiminimizers, 416
 - the one dimensional case, 409
 - weak, 419, 435
- Hausdorff measure, 334
 - variable, 335
- Hölder’s inequality, 53, 81, 82

- Initial topology, 14
- Intersection of vector spaces, 85
- Intrinsic trace space, 370
- Inverse
 - left-continuous, 72
 - right-continuous, 54
- Isomorphism, 11

- Jensen’s inequality, 17
- John domain, 237
 - John ball, 237
 - John center, 237
 - John path, 237
 - unbounded, 239

- Kernel, 208
 - Bessel, 388
 - condition (D’), 461
 - condition (D), 210
 - Newton potential, 438
 - Riesz, 199
 - standard, 208
- Korn’s inequality, 469

- Laplace equation, 417, 421
- Lattice, 250
- Lavrentiev phenomenon, 289
- Least bell shaped majorant, 128
- Lebesgue point, 353
 - for Sobolev functions, 357, 359
 - non-existence for Sobolev functions, 362
- Lebesgue space, 14, 25, 73
 - $w\text{-}L^q$, 111
 - $w\text{-}l^2$, 158
 - $l^{p(\cdot)}(\mathbb{Z}^n)$, 84
 - $L_*^{p(\cdot)}$, 285
 - $L^{p(\cdot)}$, 73
 - sequence space, 84
 - weak, 17, 111
- Left-continuous, 21
- Left-continuous inverse, 72
- Legendre transform, 52
- Lipschitz boundary, 237
- Lipschitz domain, 237
- Lipschitz functions, 293
- Lipschitz truncation, 310
- Locally finite, 115
- Locally integrable, 49
- Locally N -finite, 115
- log-Hölder continuity, 8, 100
- Lower semicontinuity
 - of modular, 28, 32, 40, 77
 - of norm, 42, 77
- Luxemburg norm, 24

- Maximal inequality
 - strong, 113, 114, 139, 181
 - vector valued, 222
 - weak, 111, 119, 120
- Maximal operator
 - M , 111
 - Hardy–Littlewood, 111
 - M_φ , 228
 - M_q , 111, 228
- Mean continuity, 247
- Measurable functions, 22
- Measure, 13
 - absolutely continuous, 16
 - atom-less, 13
 - separable, 50
- Measure space, 13, 22
- Metric measure space, 114, 247
- Micro-local spaces, 398
- Minimizer, 412
- Minkowski functional, 25, 27
- Modified Lebesgue space scale, 138, 285
- Modular, 22
 - $\varrho_{L_*^{p(\cdot)}}(\Omega)$, 285
 - $\varrho_{L^{p(\cdot)}}$, 73
 - $\varrho_{p(\cdot)}$, 74
 - $\varrho_{\text{Tr}, p(\cdot)}$, 371
 - $\varrho_{W^{k, p(\cdot)}}$, 248
 - $\varrho_{k, p(\cdot)}$, 248
- Modular space, 24
- Modulus of continuity, 15, 102, 293
- Mollifier, 128, 129
 - standard, 15
- Monotone convergence, 16, 40, 77
- Morrey space, 368
- Muckenhoupt weight, 146, 149, 197, 218
- Musielał–Orlicz
 - class, 49, 87
 - finite element, 49
 - space, 38

- N -function, 43
- Natural embedding, 59
- Negative norm theorem, 467
- Newton potential, 438
- Non-density of smooth functions, 297
- Norm conjugate formula, 57
 - L^φ , 61, 63
 - $L^{p(\cdot)}$, 79, 91, 130
- Norm-modular unit ball property, 26, 75, 88

- Obstacle problem, 402
- Operator
 - associated to a kernel, 208
 - Bogovskii, 460
 - Calderón–Zygmund, 208, 461
 - maximal, 111
 - Riesz, 199
 - Rubio de Francia, 219
 - sharp, 206, 221
 - singular integral, 208
- Orlicz norm, 34
- Orlicz space, 38
- Outer measure, 319, 328, 335

- Parabolic equations, 402
- Partition of unity, 14, 308
- Φ -function, 34
 - generalized, 36
 - positive, 34, 37
- Poincaré inequality, 255, 256, 262
 - counter example, 256
 - for zero boundary values functions, 263
 - in a modular form, 257

- Poisson problem, 378, 437, 438
- Polynomial, 379
- Proper, 61, 78

- Quasicontinuity, 339
- Quasicontinuous representative, 341, 354
- Quasieverywhere, 339
- Quasiminimizer, 416
- Quasinorm, 11
- Quotient norm, 369, 381

- Reflexive space, 12
- Regularity, 402
- Removable set for Sobolev space, 350
- Riesz
 - kernel, 199
 - potential operator, 199
 - transform, 389
- Right-continuous inverse, 54
- Rubio de Francia operator, 219

- Scaling argument, 34
- Schwartz class, 368
- Semimodular, 22
 - induced by φ , 37
 - space, 24
- Separable
 - measure, 50
 - space, 12
- Sequence space, 84
- Sharp operator, 206, 221, 371
- Signum, 60
- Simple function, 37
- Singular integral, 208, 221
- Smooth function, 15
 - $C_{0,0}^\infty$, 91, 386
 - C^∞ , 15
 - C_0^∞ , 15
- Sobolev conjugate exponent, 265
- Sobolev embedding, 265, 396
 - compact, 273, 274
 - Hölder continuity, 271
 - non-existence, 269
 - Sobolev-Poincaré inequality, 265
 - trace, 396
 - Triebel-Lizorkin space, 396
 - Trudinger type, 285
- Sobolev function, 14, 248
- Sobolev space, 14, 248
 - $ACL^{p(\cdot)}$, 345
 - $D^{k,p(\cdot)}$, 379
 - $D_0^{k,p(\cdot)}$, 379
 - $H_0^{k,p(\cdot)}$, 346
 - homogeneous, 379, 446
 - $Q_0^{1,p(\cdot)}$, 348
 - with zero boundary values, 251, 346, 348
 - $W^{k,p(\cdot)}$, 248
 - $W_0^{k,p(\cdot)}$, 251
- Sobolev-Poincaré inequality, 265
 - for zero boundary values functions, 265
- Sobolev-type space
 - $B_{p,q}^\alpha$, 393
 - $F_{p,q}^{\alpha(\cdot)}$, 394
 - $F_{p,q}^\alpha$, 393
 - $f_{p,q}^{\alpha(\cdot)}$, 394
 - $\mathcal{L}^{\alpha,p(\cdot)}$, 388
 - $\text{Tr } D^{1,p(\cdot)}$, 381
 - $(\text{Tr } W^{1,p(\cdot)})$, 370
- Solid, 41, 61, 77
- Solution, 417, 421
- Standard estimates, 208
- Standard mollifier, 15
 - family, 15
- Stokes problem, 446
 - in half-space, 451
- Strong type, 115
- Strongly dominated, 168
- Subsolution, 417, 421
- Sum of vector spaces, 85
- Superharmonic function, 420
- Supersolution, 417, 421
- Symmetric gradient, 469
- Systems of differential equations, 402

- Taylor polynomial
 - averaged, 278
- Touch, 277
- Trace, 369
 - embedding, 396
 - modular, 371
 - space, 369, 381
- Trace embeddings, 396
- Truncation, 310

- Uniformly convex
 - N-function, 43
 - norm, 12
 - semimodular, 45
 - space, 12, 46, 89, 249, 251
- Uniqueness of solutions, 402
- Unit ball property, 26, 75, 88

Variable exponent, 69
 bounded, 69
 of class \mathcal{A} , 117
 of class \mathcal{A}_{loc} , 117
 of class \mathcal{P}^{\log} , 101
Variable smoothness, 393

Weak A-solution, 421
Weak derivative, 248
Weak gradient, 248
Weak Harnack inequality, 419, 435

Weak Lebesgue space, 111
Weak Lipschitz, 100
Weak partial derivative, 248
Weak solution, 417, 421
Weak type, 111, 115
Whitney decomposition, 277

Young's inequality, 30, 52, 55, 80

0-Hölder, 100

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