

Subject Index

Notation

A_∞ , 28
 $B_b(X)$, 179
 $C(\Omega)$, 1
 $C_b(\Omega)$, 1
 $C_0^k(\Omega)$, 1
 $C_b^k(\Omega)$, 1
 $C_0^\infty(\Omega)$, 1
 $C_b^\infty(\Omega)$, 1
 $C^{2,1}(\Omega_T)$, 242
 $\text{diam } \Omega$, 1
 $d\nu/d\mu$, 3
 $\mathcal{FC}_b^\infty(X)$, 404
 $\mathcal{FC}_b^\infty(\{I_i\})$, 404
 $\mathcal{FC}_0^\infty(\{I_i\})$, 404
 $H^{p,1}$, 3
 $H^{p,s}(\mathbb{R}^d)$, 43
 $H^{p,2;1}(\mathbb{R}^d \times (-1, T))$, 345
 $\mathbb{H}^{p,s}(U, J)$, 245
 $\mathbb{H}_0^{p,s}(U, J)$, 245
 $\mathcal{H}^{p,1}(U, J)$, 245
 $H_0^{p,2;1}(U_R, [0, T])$, 245
 I_A , 3
 \mathcal{I}_ν , 338
 $L^p(\mu)$, 2
 $L^p(\Omega)$, 2
 $L^p(\Omega, dx)$, 2
 $L^p(\Omega, \mu)$, 2
 $L^{p,q}(\Omega \times J)$, 306
 $L^\infty(\mu)$, 2
 $L_{\text{loc}}^{d+}(\Omega)$, 4
 $L_{\text{loc}}^1(\mu)$, 3
 $L_{\text{loc}}^p(\Omega, \mu)$, 4
 $L_{A,b}$, 17
 $L_{A,b,c}$, 7, 17
 $\mathcal{L}_{A,b}$, 17
 $\mathcal{L}_{A,b,c}$, 7, 17
 $\mathcal{L}_{A,b,\beta,c}$, 7
 $L_{A,b}^*$, 17
 $L_{A,b,c}^*$, 17
 $\mathcal{L}_{A,b}^*$, 18
 $\mathcal{M}(\Omega)$, 2
 $\mathcal{M}_{\text{ell}}^{A,b}$, 131

$\mathcal{M}_{\text{ell,md}}^{A,b}$, 194
 \mathcal{M}_ν , 265, 288
 $\mathcal{P}(\Omega)$, 2
 $\mathcal{P}_{Ba}(X)$, 219
 \mathcal{P}_ν , 338
 \mathbb{R}_T^d , 265
 $\text{tr } A$, 1
 \mathcal{SP}_ν , 338
 $\text{supp } f$, 1
 $U(r, a)$, 1
 $U_T(a)$, 1
 u^+ , u^- , 1
 VMO , 8, 37
 $W_p(\mu_1, \mu_2)$, 169
 $W^{p,1}$, 3
 $W^{p,-1}(\mathbb{R}^d)$, 4
 $W^{p,k}$, 3
 $W_{\text{loc}}^{d+,1}(\Omega)$, 4
 $W_{\text{loc}}^{p,1}(\Omega)$, 4
 Δ , 7
 δ_a , 2
 μ^+ , μ^- , 1
 $\nu \ll \mu$, 3
 $\nu \perp \mu$, 3
 $\nu \sim \mu$, 3
 μ -a.e., 3
 $\varrho \cdot \mu$, 3
 Ω_T , 241
 $\|f\|_p$, 2
 $\|f\|_{p,1}$, 3
 $\|f\|_{p,k}$, 4
 $\|f\|_\infty$, 2
 $|\mu|$, 1
 $\|\mu\|$, 1
 $\langle \cdot, \cdot \rangle$, 1
 ∇f , 4
 ∂_{e_i} , 404

 a.e., 3
 absolute continuity of measures, 3

 Baire σ -algebra, 219
 Baire measure, 219
 Borel σ -algebra, 2

- Borel measure, 2
 Burgers stochastic equation, 410
 Cameron–Martin space, 408
 Cauchy problem, 242
 Chapman–Kolmogorov equation, xi, 11, 399
 compact function, 62, 417
 conditional expectation, 14
 continuity equation, 76, 273, 382
 Dirac’s measure, 2
 Dirichlet operator, 208
 degenerate equation, 275, 373, 380, 382
 density of a measure, 3
 diffusion, 12
 - coefficient, 185
 - matrix, 185
 - process, 12
 divergence form operator, 7
 double divergence form equation, ix
 drift, 12
 dual drift, 185
 Einstein–Smoluchowski equation, xi
 elliptic equation, 7
 elliptic operator, 7
 - divergence form, 7
 embedding theorem, 4
 - Galiardo–Nirenberg, 4
 - Sobolev, 4
 - parabolic, 246
 entropy, 169
 equation
 - Burgers stochastic, 410
 - Chapman–Kolmogorov, xi, 11, 399
 - Einstein–Smoluchowski, xi
 - Fokker–Planck–Kolmogorov, ix, 12, 13, 241, 405
 - – stationary, 14, 17
 - – with a potential, 17
 - Kolmogorov backward, 13
 - Kolmogorov forward, 13, 399
 - Navier–Stokes stochastic, 411
 - Smoluchowski, xi
 - Vlasov, 75
 - continuity, 76, 273, 382
 - degenerate, 275, 373, 380, 382
 - double divergence form, ix
 - elliptic, 7
 - nonlinear, 74, 278, 395, 430
 - parabolic, 241
 - porous media, 409
 - reaction–diffusion, 409
 - stationary, 14, 18
 - transport, 76
 equivalent measures, 3
 Feller semigroup, 212
 Fokker–Planck–Kolmogorov
 - equation, ix, 12, 13, 241, 405
 - stationary, 14, 17
 - with a potential, 17
 fractional Sobolev class, 43
 function
 - Lyapunov, 62
 - compact, 62, 417
 - quasicompact, 62
 Galiardo–Nirenberg
 - embedding theorem, 4
 Gaussian density, 21
 Gaussian measure, 15, 408
 generator, 177
 Harnack’s inequality, 36, 100
 - parabolic, 250, 315, 316
 Hölder’s inequality, 2
 - generalized, 2
 heat semigroup, 178
 homogeneous process, 12
 hypercontractive semigroup, 225
 Itô’s formula, 17
 inequality
 - Harnack, 36, 100
 - – parabolic, 250, 315, 316
 - Hölder, 2
 - – generalized, 2
 - Nash–Aronson, 313
 - Pinsker–Kullback–Csiszár, 170
 - Sobolev, 4
 - – logarithmic, 225
 infinitesimally invariant
 - measure, xi, 198, 405
 integrable solution, 19, 150, 338
 integral kernel, 210
 integral operator, 210
 invariant measure, 14, 151, 179
 irreducible semigroup, 212
 Kantorovich distance, 169
 kernel, 210
 Laplace operator, 7
 Lyapunov function, 62
 logarithmic gradient, 20
 logarithmic Sobolev inequality, 225
 Markov operator, 180
 Markov semigroup, 180
 Moser’s lemma, 324, 333
 Muckenhoupt class, 28
 martingale, 14
 maximum principle, 11, 58, 60, 250
 measure, 1
 - Baire, 219
 - Borel, 2
 - Dirac, 2
 - Gaussian, 15, 408

- Radon, 2
 - equivalent, 3
 - infinitesimally invariant, xi, 198, 405
 - invariant, 14, 151, 179
 - probability, 2
 - separable, 2
 - subinvariant, 151, 180
 - subprobability, 1, 338
- Nash–Aronson estimate, 313
- Navier–Stokes stochastic equation, 411
- nonlinear equation, 74, 278, 395, 430
- Ornstein–Uhlenbeck
- operator, 16, 21, 408
 - semigroup, 178
 - process, 16
- operator
- Dirichlet, 208
 - Laplace, 7
 - Markov, 180
 - Ornstein–Uhlenbeck, 16, 21, 408
 - integral, 210
 - sub-Markov, 151, 180
- operator semigroup, 177
- C_0 -, 177
 - Feller, 212
 - contracting, 177
 - irreducible, 212
 - regular, 212
 - strong Feller, 212
 - strongly continuous, 177
 - topologically irreducible, 212
- Pinsker–Kullback–Csiszár inequality, 170
- parabolic Harnack inequality, 250, 315, 316
- parabolic Sobolev space, 245
- parabolic embedding theorem, 246
- parabolic equation, 241
- porous media equation, 409
- probability measure, 2
- probability solution, 1, 19, 338
- process
- Ornstein–Uhlenbeck, 16
 - Wiener, 15
 - diffusion, 12
- quasicompact function, 62
- Radon measure, 2
- Radon–Nikodym density, 3
- Radon–Nikodym theorem, 3
- reaction–diffusion equation, 409
- regular semigroup, 212
- Smoluchowski equation, xi
- Sobolev
- embedding theorem, 4
 - – parabolic, 246
 - inequality, 4
 - – logarithmic, 225
 - space, 3
 - – fractional, 43
 - – parabolic, 245
 - – weighted, 4, 163
- semigroup, 177
- C_0 -, 177
 - Feller, 212
 - Markov, 180
 - Ornstein–Uhlenbeck, 178
 - heat, 178
 - hypercontractive, 225
 - irreducible, 212
 - regular, 212
 - strong Feller, 212
 - strongly continuous, 177
 - topologically irreducible, 212
- separable measure, 2
- solution
- integrable, 19, 150, 338
 - probability, 1, 19, 338
 - subprobability, 242
- standard Gaussian density, 21
- stationary distribution, 14
- stationary Fokker–Planck–Kolmogorov equation, 14, 18
- stochastic integral, 15
- strong Feller semigroup, 212
- sub-Markov operator, 151, 180
- subinvariant measure, 151, 180
- subprobability measure, 1, 338
- subprobability solution, 242
- supercontractivity, 227
- support of a measure, 210
- topological support of a measure, 210
- topologically irreducible semigroup, 212
- transport equation, 76
- ultracontractivity, 227
- Wiener process, 15
- weighted Sobolev class, 4, 163