

Index

- affine process, 16, 20, 26, 30
- anisotropic function space, 81, 112
- Aronson's estimates, 16

- Bernstein function, 44, 54, 108
- Besov space, 141
- Beurling–Deny representation, 88
- Blumenthal–Gettoor–Pruitt index, 130, 135
- bounded coefficients, 64
- bp-convergence, 13
- Brownian motion, 15, 25, 29, 44
 - coupling, 155
 - not strongly continuous on C_b , 20

- càdlàg modification, 26
- C_b -Feller property, 19
- Chapman–Kolmogorov equations, 19
- characteristic exponent, 43, 52
- characteristic function, 41
- characteristic operator, 36
 - extends generator, 37
- closed operator, 29
- complete class, 74
- completely monotone, 54
- compound Poisson process, 44, 152
- conservative, 45, 64, 167
 - criteria for —, 65
- constant coefficients, 60
- convolution semigroup, 15, 22, 25, 30, 42, 44
- core, 34
 - of Lévy generator, 48
 - of O-U generator, 30
 - sufficient conditions, 34
- coupling, 151
 - of Lévy process, 151, 153
 - of subordinate process, 155
 - property, 151
 - time, 151
 - time estimate, 157
 - successful —, 151
- Courrège–v. Waldenfels theorem, 56, 70
- covariance matrix, 43

- differential characteristics, 72
- diffusion, 16, 78, 82–83
 - with jumps, 72
- Dirichlet form, 86
 - gives Feller process, 91
- Dirichlet operator, 32, 87
- dissipative, 32
- distribution (generalized function), 55
- drift coefficient, 43
- Dynkin's formula, 37
- Dynkin–Kinney criterion, 37
- Dynkin–Reuter lemma, 33

- example
 - not strongly Feller, 22
 - of discontinuous symbol, 63
 - of generators, 29–31, 167
 - of processes, 25–26, 43–44, 71–72, 103–104, 138
 - of semigroups, 15–17, 19–20, 43–44
 - of symbols, 43–44, 59–61, 84, 138
 - transience/recurrence, 166–167
- excessive, 107
- exit probability, 118–119, 121
- extended generator, 36

- fast positiv, 56
- Feller generator, 28
 - domain, 34
 - extension, 68
 - integro-differential form, 56

- mapping property, 97–98
- pseudo-differential form, 59
- Feller process, 24
 - — generated by SDE, 83
 - — gives Dirichlet form, 90, 91
 - — is Itô process, 73
 - — solves SDE, 85
- asymptotic behaviour, 134, 135
- càdlàg modification, 26
- conservative, 65
- exit probability, 118–119, 121
- exponential moment, 127
- generated by SDE, 83
- mean exit time, 120, 124
- solution of martingale problem, 97
- Feller property, 15, 27
 - C_b - — —, 19
 - strong — —, 22, 114, 115, 153
- Feller semigroup, 15, 18
 - see also* semigroup,
 - C_b - — —, 19
 - extension to L^p , 38–39
 - strong — —, 22
 - vs. C_b -Feller semigroup, 21, 75
 - vs. Feller resolvent, 28
 - vs. strong Feller semigroup, 22, 23
- Feynman–Kac formula, 113
- Fourier multiplier, 46
- Fourier transform, 41
 - inverse — —, 41
- full class, 74
- full generator, 35
- fundamental solution, 93
- generator, 28
 - characteristic operator, 36
 - core, 34
 - extended — —, 36
 - full — —, 35
 - local operator, 37–38
 - local part, 56
 - non-local part, 56
 - of a Feller process, 56, 59
 - of a Lévy process, 46, 48
 - of a Newtonian system, 167
 - of an affine process, 31
 - of an O-U process, 30
 - pointwise — —, 33
 - subordinate — —, 109
 - weak — —, 33
- h -transform, 107
- Hartman–Wintner condition, 157
- Has’minskii’s lemma, 114
- Hausdorff dimension, 129
- Hille–Yosida–Ray theorem, 32, 78
- Hunt process, 89
- infinitely divisible, 42, 52
- integro-differential operator, 48
- irreducible, 163
- Itô process, 72
- jump measure, 43, 73
- Kato condition, 114
- killing rate, 43
- Kolmogorov equation, 93
- Lévy
 - density, 16
 - measure, 43, 73
 - process (with killing), 44
 - system, 73
 - triplet, 43, 52
- Lévy process, 15, 25, 44, 88
 - — with killing, 44
 - coupling, 151, 153
 - operator core for — —, 48
 - subordinate — —, 110
- Lévy–Itô decomposition, 50
- Lévy–Khinchine formula, 43, 52
 - for a subordinator, 108
 - proof, 58
- life-time, 24
- Liouville property, 159
- local operator, 37, 56, 88
- log-Sobolev inequality, 147
- Lyapunov function, 165
- martingale problem, 96
 - localization, 100
 - well posedness, 96
- maximal inequality, 120, 122
- mean exit time, 120, 124
- moment, 127
- Nash inequality, 146
- negative definite function, 51
- negative definite symbol, 60
- Orlicz space, 23
- Ornstein–Uhlenbeck process, 16, 25, 30, 44, 59, 159
- p -variation, 136
- petite set, 163
- Plancherel’s identity, 41

- Poincaré inequality, 148
 - Poisson process, 15, 19, 22, 25, 29, 44
 - positive definite, 50
 - conditionally —, 51
 - positive maximum principle (PMP), 32, 55
 - as limit of Dirichlet operators, 32
 - limit of Dirichlet operators, 32
 - potential, 114
 - potential operator, 27
 - prèsque positif, 56
 - pseudo-differential operator, 60

 - recurrent, 163
 - resolvent, 27, 31
 - equation, 27
 - operator, 27
 - Riesz representation theorem, 18

 - sector condition, 87, 89, 121
 - semigroup, 14
 - adjoint —, 39
 - conservative —, 14, 23–24
 - contraction —, 14, 169
 - convolution —, 42
 - exponential formula, 27
 - Feller —, 15
 - inversion formula, 27
 - Lipschitz —, 172
 - Markov —, 14
 - norm continuous —, 19
 - positive —, 14
 - strongly continuous —, 15, 17–18, 169
 - sub-Markov —, 14
 - subordinate —, 108
 - symmetric —, 38
 - uniformly equi-bounded —, 169
 - vaguely continuous —, 15, 42
 - semimartingale, 72
 - characteristics, 72
 - shift semigroup, 15, 19, 22, 25, 29, 44
 - Sobolev space, 78, 110, 139
 - spatially homogeneous, 25
 - stable semigroup, 15, 25, 29, 44
 - stochastic continuity, 26
 - vs. strong continuity, 26
 - stochastic differential equation
 - generates Feller process, 83
 - strong continuity, 17–18
 - vs. stochastic continuity, 26
 - subordinate process, 108
 - subordination, 108, 154
 - generator, 109
 - preserves functional inequality, 146
 - functional calculus, 109
 - subordinator, 16, 26, 44
 - supermedian, 107
 - symbol, 46, 60
 - of a Feller process, 60, 66, 70
 - of a Lévy process, 66
 - of a stochastic process, 71
 - of an SDE, 83
 - bounded coefficients, 64
 - continuity in x , 63, 65
 - defines differential characteristics, 73
 - describes mapping property, 97–98
 - negative definite —, 60
 - probabilistic formula, 70
 - smoothness in ξ , 53, 81–82
 - smoothness in x , 81–82
 - subordinate —, 110
-
- T -model, 163
 - time change, 106
 - transient, 163
 - transition function, 24
 - translation invariant, 42, 88
 - Triebel–Lizorkin space, 141
 - truncation function, 43

 - ultracontractivity, 22
 - vs. strong Feller property, 22

 - vague convergence, 13
 - vanishing at infinity, 13
 - variable coefficients, 60

 - wavelet basis, 143
 - weak convergence, 13, 14, 33