Index

Airy functions, 120–2, 125
aligned jets, 192, 196
analyticity, 4, 6, 8
angular ordering, 163–5
anomalous dimensions, 156–8, 160–2, 167
associated jets, 149–54, 168

BFKL equation, 83, 87–94, 99–103, 108, 110, 114, 164, 165, 214, 223
Bjorken scaling, 155, 160, 192
bootstrap, 8, 74, 106

Callan-Gross relation, 155
Carlson's theorem, 10
coefficient functions, 156, 160–2
coherence, 162–8
colour factors, 26, 28, 31, 39, 42, 52–4, 61, 63, 64, 67, 75–6, 79, 82–5, 87, 88, 94–6, 145, 150, 151, 208, 216
complex angular momentum, 9
Compton scattering, 142, 175–6
conformal eigenfunctions, 100, 221
conformal invariance, 101
crossed ladder diagrams, 40, 41, 44, 49, 70
crossing symmetry, 5, 9, 28, 53, 64
Cutkosky rules, 3, 4, 7, 28, 54, 56

deep inelastic scattering, 23, 33, 99, 139–68, 185, 190, 192, 194, 202
DGLAP equations, 153, 155–62
diffraction, 193, 194
diffraction dissociation, 21–3, 185, 190, 193, 194, 198, 199
diffraction eigenstates, 189, 190, 195, 196
diffusion, 114–17, 135, 136, 149, 152, 153, 176, 180–2, 212
digamma function, 92
dipole
  annihilation/creation operators, 215–22, 229
  density, 206–12, 214
  evolution, 215, 217, 218, 226
  saturation, 226, 227, 231
  scattering, 204, 205–12, 214, 220–3
dispersion relations, 6–8, 214
Dyson–Schwinger equations, 128–9

effective action, 108
effective vertex, 49, 58, 64–7, 69, 74, 78, 82, 87
eigenfunctions, 90–2, 100, 101, 115, 118–26
eigenvalues, 90, 92, 101, 118, 121, 124, 125, 130, 222
eikonal approximation, 51–2, 58, 59, 64, 97, 105, 235

factorization
  QCD, 156–8, 162
  Regge, 12, 104, 200
fan diagrams, 106
fermion loops, 37, 72, 105
Feynman parameters, 25, 28, 97, 173, 179
Feynman rules for QCD, 50, 238–9
Fock space expansion, 98–9, 132, 189, 204
form factor, 20
Fourier transform, 99, 110–12, 124, 136, 209, 211
Froissart–Martin bound, 18, 103, 213, 214, 231

glueballs, 17, 20
gluon density, 144, 155, 158, 159, 161, 202, 214

https://doi.org/10.1017/9781009290111.013 Published online by Cambridge University Press

H1 collaboration, 22, 23, 148
HERA, 1, 23, 147, 148, 154
heterotic Pomeron, 135–7
higher order effects, 104–9

impact factors, 94–6, 98, 102–4, 114, 117, 132, 139, 140, 142–7, 149–51, 158, 169–73, 176–9, 182–5, 206–8, 236
impact parameters, 99, 110, 123, 135, 205, 211
infrared divergences, 55, 80, 89–90, 94, 95, 98, 108, 111, 165
integral equation, 42, 43, 74–5, 77, 78, 83, 88, 118, 120
ISR, 19

Jacobi identity, 61, 75

kernel, 90, 91, 100, 106, 129, 135–7, 165, 166, 179, 221

ladder diagrams, 38, 39, 42, 49, 68–70, 74, 76, 187
Landshoff–Nachtmann model, 126–9
large N limit, 210, 216, 226, 236
Legendre polynomials, 9, 11
low-x, 141–9, 158, 160, 163, 188, 192

Mandelstam variables, 2, 28
Mellin transforms, 35, 36, 40, 43, 45–7, 77, 85, 86, 93, 94, 115, 142, 155, 158, 159, 168
moments of structure functions, 155–7, 159
multi-Pomeron exchange, 19, 214, 223, 225, 226, 228
multi-Regge region, 75, 90, 105, 107, 140, 162, 164
multiple scattering, 212, 214, 220, 223–31

non-perturbative effects, 23, 113, 114, 121, 122, 126–7, 147, 149, 151, 153, 158, 190–2, 197, 231
nonsense poles, 13, 14

odderon, 83, 107
optical theorem, 4, 15, 21, 140, 212

partial waves, 9, 10, 214
parton density, 151, 153, 155–7, 192, 200–2
phase matching, 121, 123–5, 130
phase-space integration, 29, 30, 32, 33, 39, 40, 42, 54, 62, 75, 96, 236
photon dissociation, 185, 193–8
Pomeranchuk theorem, 15–16, 18

quark density, 155, 160
quark-counting rule, 20, 104, 127, 128

rapidity, 22, 168, 209, 216, 225, 230, 234, 236
rapidity gap, 22, 175, 194, 201, 202, 227
Regge cuts, 12, 19, 48, 92–4, 113, 114
Regge poles, 10, 11, 13, 16, 200, 201
Regge region, 11–13, 25, 44, 50, 168
Regge theory, 1, 8
Regge trajectory, 13–20, 22, 23, 25, 48, 50, 75, 80, 82, 84, 104, 108, 123, 126, 128, 130, 132, 133, 136, 165
reggeized gluon, 50, 51, 73–6, 78, 80, 82, 83, 87, 88, 98, 105, 106, 184, 187, 210
Reggeon, 12, 16, 106, 108
ρ-parameter, 13, 21
running coupling, 114, 117–18, 123, 124, 126, 129, 130, 134, 135, 162

saddle point method, 147, 152, 173–4, 181, 212, 223
scaling violations, 155, 160, 189, 190, 192
s-channel discontinuity, 5
signature, 9–13, 21, 80, 84
Sommerfeld–Watson transform, 9
S-matrix, 2–4, 218–20, 223, 225, 226, 230, 239
splitting functions, 145, 157
structure functions, 23, 99, 141–9, 155–62, 165–8
  of Pomeron, 22, 198–202
Sudakov variables, 29, 32, 54, 86, 96, 105

Tevatron, 1, 18, 19, 184
T-matrix, 3, 189, 239

https://doi.org/10.1017/9781009290111.013 Published online by Cambridge University Press

total cross-section, 4, 15–18, 19, 21, 23, 24, 113, 126, 139, 140, 143, 144, 149, 162, 193, 213, 214, 223–5, 228, 230, 231

UA4 collaboration, 21
UA8 collaboration, 22
ultraviolet divergences, 62, 108, 189, 217, 219
unitarity, 2–4, 8, 18, 75, 103, 105, 106, 204, 213–14, 220, 225
unitarization, 213, 225, 230, 231

vector meson production, 176, 182

WA91 collaboration, 20
WKB approximation, 118, 121

Zeus collaboration, 22, 23, 148, 184

https://doi.org/10.1017/9781009290111.013 Published online by Cambridge University Press

https://doi.org/10.1017/9781009290111.013 Published online by Cambridge University Press

https://doi.org/10.1017/9781009290111.013 Published online by Cambridge University Press

https://doi.org/10.1017/9781009290111.013 Published online by Cambridge University Press

https://doi.org/10.1017/9781009290111.013 Published online by Cambridge University Press