Index

absorbance, 4, 5, 91, 103
absorptance, 3, 5, 111
absorption coefficient, 3, 5
absorption cross-section, 4, 5, 188, 209, 251
acousto-optic modulator, 155
active medium, 39
amplification coefficient, 41
angular aperture, 33, 111, 233
anisotropy coefficient, 255
APD, 78
Ar ion laser, 154
autocorrelation function, 85
autocorrelator, 85
avalanche photodiode, 78, 131, 146, 156, 161

band limited pulse, 291
base line, 91, 92, 94
BBO, 220, 231
black body, 9
    spectral emittance, 9
Brewster angle, 206

cavity dumper, 155
CCD, 78, 79, 95, 111, 179, 181, 191, 211, 230, 232
charge couple device, 78
circular frequency, 17
circular polarization, 244, 250
color temperature, 10
component spectra, 284
constant fraction discriminator, 151
continous wave mode, 42
contrast factor, 25
convolution integral, 162, 277
correction spectrum, 113, 114
cuvette, 100, 122
    matching pair, 95, 101
CW lasers, 45
CW mode, 42

dark counts, 73, 120, 125, 156, 166, 228
dark current, 73
DAS, 164
dead time, 289
decay associated spectra, 164, 284
decay component spectra, 212
detectivity, 73
dichroic mirror, 167
dielectric mirrors, 26
differential
    absorbance, 132, 142, 214
    absorption spectra, 133, 146, 193, 211
differential absorbance, 131
differential absorption, 212
diffraction, 27
    grating, 29, 52, 97
    limit, 28
diffusion controlled reaction, 269
discriminator, 76, 77, 117, 218
dispersion, 203, 221
Doppler
    broadening, 238, 239
    shift, 237
dye laser, 51, 154

eigen-value, 271

Einstein coefficients, 12
electronic levels, 7
emission corrected spectrum, 114
emissivity, 10
equilibrium, 273
Euler formula, 17
excitation spectrum, 109, 115
exciton annihilation, 214
extinction coefficient, 4
extraordinary polarization, 56, 220

Fabry-Perot interferometer, 22, 42, 239, 240, 243
first order reaction, 267
flash lamp, 154
flash-photolysis, 83
fluorescence, 13
fluorimeter, 108
frequency domain, 172
frequency response, 74
Fresnel integral, 27
front face scheme, 121
FWHM, 291

G-factor, 256
Gaussian
  band, 265, 291
  distribution, 66
  pulse, 85, 201, 207, 225, 291
geometrical optics, 33
grating period, 29
gray coefficient, 9
groovers number, 30
group velocity dispersion, 190, 196, 202, 212, 221, 230, 233

harmonic waves, 17
Helmholtz equation, 18
hole-burning, 242
homogeneous broadening, 238, 242

idler wave, 59
image intensifier, 75
indirect measurements, 263
indirect problem, 264
inhomogeneous broadening, 238, 242
instrument response function, 162, 206, 212, 223, 277, 284
interference, 19
interferometer, 20
intermediate state, 269
intersystem crossing, 12
intrinsic rate constant, 269
inverse kinetics, 272
inverse population, 39, 46
inverse problem, 264
inversion, 40
iteration, 280

Johnson noise, 70

Kerr effect, 232
Kerr lens, 53, 195, 232

Lambert law, 3
laser
  equation, 41
  resonator, 41, 241, 244
  time constant, 42
lasing threshold, 42, 242
light amplification, 13
linear parameter, 281
linear polarization, 250
linear reaction scheme, 271, 284
lock-in amplifier, 174
longitudinal mode, 43, 242
Lorentzian band, 264

magic angle, 252
mean square deviation, 67, 277
Michelson interferometer, 20
micro-channel plate
  MCP, 75
  photomultiplier tube, 75, 156, 161
mode-beating, 243
mode-locked laser, 47, 231
mode-locking, 154, 195
molar absorption coefficient, 4, 5
molar absorptivity, 4
monochromatic wave, 17

monochromator, 31, 91, 95, 97, 109, 146
  dispersion equation, 32
multichannel analyzer, 152

Nd:YAG laser, 49, 51, 57, 146, 154, 195, 210
NEP, 73
noise equivalent power, 73
non-correlated noise, 277
non-linear parameter, 281

off axis mirror, 205, 223
optical density, 4
optical parametric amplifier, 59, 198
optical parametric oscillator, 59, 146
ordinary polarization, 56, 220

parametric amplifiers, 198
paraxial approximation, 33
peal-up distortions, 157, 289
phase matching, 56, 218
phosphorescence, 13
photo-bleaching, 134, 193
photodiode, 78, 83, 117, 131, 138, 141, 145, 151, 186, 187, 244
photomultiplier, 74, 83, 90, 108, 117, 124, 218
photon counting, 76, 110, 117, 120, 218, 226
photon noise, 70
plane wave, 17
Pockels
  cell, 46, 49
  effect, 232
Poisson
  distribution, 64, 289
  noise, 70
polarization, 47, 56, 58, 220, 228, 232, 233, 249
  ratio, 251
  vector, 55
population inversion, 215
pre-triggering, 132
prism compressor, 205
probability
  density function, 63
  function, 63
pump-probe, 83, 185, 293
  mono-color scheme, 185
  two-color scheme, 188

Q-switching, 46
qualitative problem, 285
quantum efficiency, 73
quantum noise, 70

Raman scattering, 123
random
  error, 62
  noise, 62
  search, 297
  value, 63
reference channel, 93, 103, 191
resonator
  bandwidth, 42
  losses, 241
  modes, 242
  time constant, 42
responsivity, 73
right angle scheme, 121, 122
rotational correlation time, 256
rotational diffusion, 256
rotational levels, 7

saturable absorber, 195
second harmonic, 167, 198, 203, 210, 217, 228, 235
  generation, 50, 53, 56, 83, 154, 231
  generator, 83
second order rection, 268
second order susceptibility, 55
semiconductor laser, 54, 155
sensitivity, 73
sigma-value, 67
signal wave, 59
singlet state, 12, 14, 151, 163, 253, 261
spectral hole-burning, 248
spectrofluorometer, 108
spectrograph, 111, 191
spectrophotometer, 89

spectrum correction, 113, 116
spontaneous
    emission, 11
    reaction, 11, 268
square root law, 67, 68, 73, 110, 118
standard deviation, 67
standing wave, 243
stationary noise, 277
Stefan-Boltzmann law, 10
stimulated
    emission, 11, 39, 59, 214
    reaction, 11
Stokes shift, 117
stratcher, 196
streak camera, 179
susceptibility, 55
synchronous
    detection, 92, 200, 210
    detector, 174
systematic error, 62

T–scheme, 135
TEM, 43
    mode, 44, 45, 50
thermal noise, 70
thermal relaxation, 11
Ti:sapphire laser, 52, 155, 167, 195, 203, 210, 231, 232, 292, 294
time constant, 74
time correlated single photon counting, 151, 195, 289
time domain, 172
time-to-amplitude converter (TAC), 152
transient time spread, 77, 157
transition dipole moment, 251
transmittance, 3, 5, 91, 94, 103
transverse mode, 43
transverse wave, 249
trigger jitter, 181
triplet states, 12
tungsten lamp, 10
two photon absorption, 293
    coefficient, 293
type I crystal, 220
type I synchronism, 58
type II crystal, 220

uncertainty principle, 207, 237
uncorrected emission spectrum, 113
up-conversion, 54, 58, 182, 217, 293

vibrational levels, 7

wave mixing, 218
wave vector, 18
white continuum, 190, 210
    generation, 197
    generator, 189, 199
Wien law, 10

Xe arc lamp, 11, 146

zero-phonon line, 247