## Subject index

active medium 90, 92
admittance dyadic 72
affine transformations 112-7
affinely isotropic medium 116, 135
affinely uniaxial medium 116
analyticity of fields 186
anisotropic half space problem 275-9
anisotropic medium
Green dyadic 133
dispersion equation 157
antenna above ground 247
antihermitian dyadics 39
antisymmetric dyadic 19, 21, 27
Appleton-Hartree formula 161
axial decomposition 9

Babinet's principle 122-4 base dyadics 49 beam mode radiation 152 bi-isotropic boundary 73 bi-isotropic medium 57 bianisotropic medium 56 boundary conditions 71-4, 92-3 boundary operator 81-2 branch circle 149

cavity field 143
Cayley-Hamilton equation 29, 37
characteristic impedance 202
circular polarization 3
co-polarized vectors 7
co-uniaxial dyadics 44
coaxially gyrotropic dyadics 45
complete dyadic 21, 31
complex
delta function 150
distance function 149
vector bases 14
vectors 1-17

continuity condition 54

corrugated surface 73 CP vector 3 cross-polarized vectors 7 cross-product square 28 cross-square of dyadics 281

delta expansion 175 depolarization dyadic 143, 146 determinant of dyadic 28, 281 dipole approximation of multipole 178 dipole mode radiation 152 discontinuities of fields 69-70 dispersion equation 154 dispersive medium 57 dot product 22 double-cross product 25, 281 double-dot product 24 duality transformation 100-12 dyad 17 dyadic 18 characteristic impedance 202, 204 eigenvalues 36-9 equations 30-6 identities 26, 281-3 image functions 208 products 18 square root 33

eigenvalues of dyadics 36-9, 48
EIT 199-279
electric reflection 118
elliptic polarization 3
ellipticity of vector 11
EMP 167
energy conditions 89-93
equivalent sources 165-97
exact image theory 199-279
extraordinary wave 159, 162

318 SUBJECT INDEX

finite part 147
Fourier transformations 59-63

gauge 64 Gaussian pulse 150 Gibbs' identity 14 Green dyadic anisotropic medium 133 bi-isotropic medium 132 one dimensional 140 singularity 144-8 two dimensional 138 Green function dvadic 126, 131 scalar 125, 129 isotropic interface 246 microstrip 272 gyrotropic dyadic 24, 42, 45 gyrotropic medium 160

half-space Green function 141 half-space image problem 235-59 handedness of vector 3 Helmholtz equations 61-2 hermitian dyadics 39 Hertz potentials 67 Hertz vector 66 Huygens' principle 183-7 Huygens' source 182-3

image principle, mirror 119
impedance dyadic 72
wire grid 231
uniaxial half space 276
impedance sheet 77-8
impedance surface 224
interface conditions 74-77
invariants of dyadics 28
inverse of dyadic 29, 50, 283
involutory affine transformations 117
isotropic boundary 72

layered media 199 line source decomposition 194 linear dyadic 22, 31 linear dyadic equations 31-2 linear mapping 20 linear polarization 2 longitudinal propagation 161 loop antenna radiation 255 Lorentz force 54 Lorenz gauge 66 lossless medium 91 LP vector 2

magnetic impedance sheet 78-9 magnetic reflection 118
Maue integral equation 190
Maxwell equations 53-4
medium conditions 89-94
medium equations 54, 56-7
MFIE 189
microstrip guided modes 271
microstrip image problem 260-74
mirror image principle 119
multilinear identity 4
multipole expansion 176
multipole sources 174-81

NCP vector 9 NLP vector 3 non-radiating source 165 norm of dyadic 25 NR source 165

object in front of interface 257 optical axis 158, 162 ordinary wave 159, 162

p vector 10
parallel vectors 5
passive medium 90
PD dyadics 40
perpendicular vectors 5
planar current sheet 144
planar dyadic 22, 31
planar inverse of dyadic 32, 281
planar unit dyadic 32
plane source decomposition 196
plane waves 154-63

SUBJECT INDEX 319

decomposition 107-8 point source decomposition 197 polarity reversal 97 fields 105-6 polarization match factor 7 medium 101, 106 polarization vectors 10 sources 106 self-reflecting fields 119 polyad 17 shearer 35 polynomial operator 126 sheet conditions 77-81 positive definite dyadics 40 Silver-Müller condition 73, 88 potentials 63-68 singularity of surface source 147 power orthogonality 7 Poynting vector 89 singularity of volume source 146 Sommerfeld integrals 205 principal value 146 propagation factor 202 Sommerfeld surface wave 235 source equivalence 165-97 a vector 12 space inversion 99 quadratic dyadic equations 33-5 spm of dyadic 28, 281 square root of dyadic 33, 51 radiation condition 73 strictly planar dyadic 22, 31, 37 reciprocal base 19, 22 surface integral equations 187-91 reciprocal surface 73 symmetric dyadic 19, 27 reciprocity 93-4 reflection dyadic 43, 203 TE/TM decomposition of sources 192impedance sheet 228 impedance surface 224 Tellegen medium 57 interface 205 Tellegen parameter 94 time reversal 98 isotropic interface 237 wire grid 232 time-harmonic vector 1 trace of dyadic 24, 281 microstrip 261 trace-free shearer 35 quad uniaxial half space 277 transmission dvadic 203 reflection Green functions 219 impedance sheet 230 reflection image function 210 isotropic interface 250 asymptotic expansion 240 quad isotropic interface 238 wire grid 232 Taylor expansion 239 transmission Green dyadic 222 impedance sheet 229 wire grid 233 uniaxial half space 277 impedance surface 225 reflection parameter 237 transmission image functions 217 reflection transformations 117-24 isotropic interface 250 impedance sheet 230 wire grid 233 rotation dyadic 41 transmission-line equations 202 transversal propagation 161 scalar potential 64 scattering from object 257 two-dimensional dyadics 47 two-dimensional inverse 281 self duality 101-10 self-dual

uniaxial

boundaries 107

320 SUBJECT INDEX

anisotropic half space 275 dyadic 44 medium Green dyadic 136 medium dispersion equation 158 uniqueness 84-8 unit dyadic 21 unit vector representation 13

vector circuits 70 vector potential 64 vector transmission line 200 vector voltage 202 volume integral equation 147

wave equations 57-8 wave vector surfaces 156 wire grid 83 image theory 231