

## ABBREVIATIONS

AAPM	American Association of Physicists in Medicine
AC	attenuation correction; alternating current
ACR	American College of Radiology
ADC	analogue to digital converter
ADT	admission, discharge, transfer
AFOV	axial field of view
ALARA	as low as reasonably achievable
ANSTO	Australian Nuclear Science and Technology Organisation
APD	avalanche photodiode
ASCII	American Standard Code for Information Interchange
BED	biological effective dose
BGO	bismuth germanate
BMIPP	$\beta$ -methyl-p-iodophenylpentadecanoic acid
BMP	bitmap
BSS	Basic Safety Standards
CDR	collimator–detector response
CDF	cumulative density function
CERN	European Organization for Nuclear Research
CF	calibration factor
CFD	constant fraction discriminator
CFOV	central field of view
CIE	International Commission on Illumination
CLUT	colour lookup table
CMOS	complementary metal oxide semiconductor
CMS	colour management system
CMYK	cyan, magenta, yellow, key (black)
COTS	commercial off the shelf
cpm	counts per minute
cps	counts per second
CR	contrast ratio
CRT	cathode ray tube
CT	computed tomography
CZT	cadmium zinc telluride
DC	direct current
DCT	discrete cosine transform
DDL	digital driving level

## ABBREVIATIONS

DIB	device independent bitmap
DICOM	Digital Imaging and Communications in Medicine
DMSA	dimercaptosuccinic acid
DNA	deoxyribonucleic acid
dpi	dots per inch
DPM	disintegrations per minute
DRL	diagnostic reference level
DSB	double strand break
DTPA	diethylenetriaminepentaacetic acid
DVH	dose–volume histogram
EANM	European Association of Nuclear Medicine
EBRT	external beam radiotherapy
ECG	electrocardiogram
EDV	end diastolic volume
EGF	epidermal growth factor
EGS	electron gamma shower
e–h	electron–hole
EM	expectation maximization
ERPF	effective renal plasma flow
ESV	end systolic volume
FBP	filtered back projection
FDA	Food and Drug Administration
FDG	fluorodeoxyglucose
FFT	fast Fourier transform
FORE	final rebinning algorithm
FOV	field of view
FWHM	full width at half maximum
FWTM	full width at tenth maximum
GFR	glomerular filtration rate
GIF	Graphics Interchange Format
GPU	graphical processing unit
GSDF	grey scale standard display function
GSO	gadolinium oxyorthosilicate
HMPAO	hexamethylpropyleneamine oxime
HPMT	hybrid photomultiplier tube
HTML	Hypertext Markup Language
HU	Hounsfield unit

## ABBREVIATIONS

HVL	half-value layer
ICC	International Color Consortium
ICRP	International Commission on Radiological Protection
ICRU	International Commission on Radiation Units and Measurements
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IPS	in-plane switching
IQ	image quality
ISO	International Organization for Standardization
JFIF	JPEG File Interchange Format
JND	just noticeable difference
JPEG	Joint Photographic Experts Group
LCD	liquid crystal display
LET	linear energy transfer
LOR	line of response
LQ	linear–quadratic
LR	luminance ratio
LS	least squares
LSF	line spread function
LSO	lutetium oxyorthosilicate
LUT	lookup table
LZW	Lempel–Ziv–Welch
MAA	macroaggregate of albumin
MAG3	mercaptoacetyltriglycine
MAP	maximum a posteriori
MCNP	Monte Carlo N-particle transport code
MCP	microchannel plate
MFP	mean free path
MIBG	metaiodobenzylguanidine
MIBI	methoxyisobutylisonitrile
MIP	maximum intensity projection
MIRD	medical internal radiation dose
MLEM	maximum-likelihood expectation-maximization
MR	magnetic resonance
MRI	magnetic resonance imaging
MRN	medical record number
MSE	mean square error

## ABBREVIATIONS

MTF	modulation transfer function
MUGA	multiple-gated acquisition
MWPC	multiwire proportional chamber
NEA	negative electron affinity
NECR	noise equivalent count rate
NEMA	National Electrical Manufacturers Association
NET	neuroendocrine tumour
NHEJ	non-homologous end joining
NIST	National Institute of Standards and Technology
NPL	National Physical Laboratory
NTCP	normal tissue complication probability
NURBS	non-uniform rational B-spline
OER	oxygen enhancement ratio
OSEM	ordered-subsets expectation-maximization
PACS	picture archiving and communication system
PAH	para-amino hippurate
PAHO	Pan American Health Organization
PCS	profile connection space
PDF	Portable Document Format
PDR	perceived dynamic range
PET	positron emission tomography
PMT	photomultiplier tube
POPOP	para-phenylene-phenyloxazole
PSF	point spread function
PSRF	point source response function
PV	plasma volume
PVE	partial volume effect
QA	quality assurance
QC	quality control
QMS	quality management system
RAMDAC	random access memory digital to analogue converter
RAMLA	row-action maximum-likelihood algorithm
RBE	relative biological effectiveness
RC	recovery coefficient
RGB	red, green, blue
RIS	radiology information system

## ABBREVIATIONS

RIT	radioimmunotherapy
ROI	region of interest
RPO	radiation protection officer
RPP	radiation protection programme
RSS	Real Simple Syndication
SI	International System of Units
SiPM	silicon photomultiplier tube
SNR	signal to noise ratio
SPECT	single photon emission computed tomography
SPR	scatter to primary ratio
SSB	single strand break
SUV	standardized uptake value
TCP	tumour control probability
TDC	time to digital converter
TEW	triple energy window
TIFF	Tagged Image File Format
TOF	time of flight
TLG	total lesion glycolysis
TVL	tenth-value layer
UFOV	useful field of view
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
UPS	uninterruptable power supply
UTF	Unicode Transformation Format
WHO	World Health Organization
WLS	weighted least squares
WYSIWYG	what you see is what you get
XML	Extensible Markup Language



## SYMBOLS

### Roman symbols

<i>a</i>	year (unit of time)
<i>a</i>	acceleration; area; specific activity
$\tilde{a}$	time integrated activity coefficient
<i>A</i>	ampere (SI unit of current)
<i>A</i>	atomic mass number
$\text{\AA}$	ångström (unit of distance: $1 \text{\AA} = 10^{-10} \text{ m}$ )
$\tilde{A}$	cumulated activity
<i>A</i>	activity
<i>b</i>	barn (unit of cross-section)
Bq	becquerel (SI unit of activity)
<i>c</i>	speed of light
C	capacity; coulomb (SI unit of charge)
°C	degree Celsius (unit of temperature)
<i>C</i>	activity concentration; counts
cd	luminous intensity: candela
Ci	curie (unit of activity: $1 \text{ Ci} = 3.7 \times 10^{10} \text{ Bq}$ )
<i>d</i>	day (unit of time)
<i>d</i>	depth; distance
<i>D</i>	dose; thickness
$\dot{D}$	dose rate
dB	decibel
<i>e</i>	electron charge
<i>E</i>	effective dose; electric field; energy
$E_{\text{ab}}$	absorbed energy
$E_{\text{B}}$	binding energy
$E_{\text{K}}$	kinetic energy
$E_{\text{tr}}$	transferred energy
$E_{\gamma}$	photopeak energy
$E(\tau)$	committed effective dose
$\bar{E}_{\text{ab}}$	mean absorbed energy
$\bar{E}_{\text{tr}}$	mean transferred energy
eV	electronvolt

## SYMBOLS

F	farad (SI unit of capacitance)
$F$	Fano factor; force
G	gravitational constant
Gy	gray (SI unit of dose)
h	hour (unit of time)
$h$	Planck's constant
$H_p$	personal dose equivalent
$H_T$	equivalent dose
$H_T(\tau)$	committed equivalent dose
Hz	unit of frequency
$I$	electric current; intensity
$j$	current density
J	joule (SI unit of energy)
K	kelvin (SI unit of thermodynamic temperature)
$K$	kerma
kg	kilogram (SI unit of mass)
$l$	length
L	litre (unit of volume)
$L$	luminance
m	metre (SI unit of length)
$m$	mass
$m_a$	atomic mass in atomic mass units u
$m_e$	electron rest mass; positron rest mass
$m_n$	neutron rest mass
$m_p$	proton rest mass
$M$	nuclear mass
mol	amount of substance: mole
N	newton (SI unit of force)
$N$	number of counts; number of neutrons in an atom
$N_a$	number of atoms
$N_A$	Avogadro's number
$N_{el}$	number of electrons
$N_{ph}$	number of photons



## SYMBOLS

$p$	momentum; probability
$P$	power; pressure
Pa	pascal (SI unit of pressure)
$Q$	disintegration energy; electric charge; perfusion; reaction energy
$r$	correlation coefficient; radius
R	roentgen (unit of exposure)
$R$	counting rate; dose rate; radius; random coincidence count rate
$R_E$	fractional energy resolution
$R_0$	nuclear radius constant
s	second (unit of time)
$s$	septal thickness; sample standard deviation
$s_{\text{col}}$	collision stopping power
$s_{\text{rad}}$	radiation stopping power
$s_{\text{tot}}$	total stopping power
$s^2$	sample variance
$S$	absorbed dose rate per unit activity; sensitivity
Sv	sievert (unit of equivalent dose and unit of effective dose)
$t$	time
T	tesla (SI unit of magnetic field strength)
$T$	temperature
$T_{1/2}$	half-life
u	atomic mass unit
V	volt (unit of voltage)
$V$	ventilation; voltage; volume
$w$	width
$w_R$	radiation weighting factor
$w_T$	tissue weighting factor
W	watt (SI unit of power)
$W$	mean energy to produce an information carrier; weight
$x_{1/2}$	half-value layer
$x_{1/10}$	tenth-value layer
$\bar{x}$	mean free path
$\bar{x}_e$	experimental mean

## SYMBOLS

$\bar{x}_t$	true mean
$X$	exposure
$z$	specific energy
$Z$	atomic number
$Z_{\text{eff}}$	effective atomic number

### Greek symbols

$\alpha$	alpha particle
$\alpha$	linear radiosensitivity constant
$\beta$	beta particle
$\beta$	quadratic radiosensitivity coefficient
$\gamma$	gamma ray
$\Gamma$	air kerma rate constant
$\varepsilon_0$	electric constant (permittivity of vacuum)
$\varepsilon_T$	total energy imparted by radiation to the tissue or organ
$\bar{\varepsilon}$	mean energy imparted
$\eta$	quantum efficiency; refractive index
$\kappa$	pair production attenuation coefficient
${}_a\kappa$	pair production atomic attenuation coefficient
$\lambda$	radioactive decay constant; wavelength
$\mu$	linear attenuation coefficient; mobility of charged carriers
$\mu_{\text{ab}}$	energy absorption coefficient
$\mu_{\text{m}}$	mass attenuation coefficient
$\mu_{\text{tr}}$	energy transfer coefficient
${}_a\mu$	atomic attenuation coefficient
${}_e\mu$	electronic attenuation coefficient
$\mu_0$	magnetic constant (permeability of vacuum)
$\nu$	photon frequency
$\nu_e$	electronic neutrino
$\bar{\nu}_e$	electronic antineutrino

## SYMBOLS

$\rho$	mass density
$\sigma$	cross-section; standard deviation
$\sigma_C$	Compton attenuation coefficient
$\sigma_e$	experimental standard deviation
$\sigma_{eF}$	experimental fractional standard deviation
$\sigma_F$	fractional standard deviation
$\sigma_P$	percentage standard deviation
$\sigma_R$	Rayleigh attenuation coefficient
${}_a\sigma_R$	Rayleigh atomic attenuation coefficient
${}_a\sigma_C$	Compton atomic attenuation coefficient
${}_e\sigma_C$	Compton electronic attenuation coefficient
$\sigma^2$	variance
$\sigma_e^2$	experimental variance
$\tau$	dead time; mean life
${}_a\tau$	photoelectric atomic attenuation coefficient
$v$	velocity
$\omega$	angular frequency; fluorescence yield
$\Omega$	ohm (SI unit of electrical resistance); solid angle



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