

CPC**COOPERATIVE PATENT CLASSIFICATION****G01T**

MEASUREMENT OF NUCLEAR OR X-RADIATION (radiation analysis of materials, mass spectrometry [G01N](#) ; counters per se [G06M](#) , [H03K](#) ; electric discharge tubes for analysing radiation or particles [H01J 40/00](#) , [H01J 47/00](#) , [H01J 49/00](#))

NOTE

This subclass covers the measurement of X-radiation, gamma radiation, corpuscular radiation, cosmic radiation or neutron radiation.

Attention is drawn to the Notes following the title of class [G01](#) .

G01T 1/00

Measuring X-radiation, gamma radiation, corpuscular radiation, or cosmic radiation ([G01T 3/00](#) , [G01T 5/00](#) take precedence)

G01T 1/003

- . { Scintillation (flow) cells }

G01T 1/006

- . { Total absorption calorimeters; Shower detectors }

G01T 1/02

- . Dosimeters ([G01T 1/15](#) takes precedence, measuring exposure time to X-rays [H05G 1/28](#))

G01T 1/023

- .. { Scintillation dose-rate meters }

G01T 1/026

- .. { Semiconductor dose-rate meters }

G01T 1/04

- .. Chemical dosimeters ([G01T 1/06](#) , [G01T 1/08](#) take precedence)

G01T 1/06

- .. Glass dosimeters { using colour change; including plastic dosimeters }

G01T 1/08

- .. Photographic dosimeters (sensitive materials, processing thereof [G03C](#) ; { photometry [G01J 1/52](#) })

G01T 1/10

- .. Luminescent dosimeters

G01T 1/105

- ... Read-out devices ([G01T 1/115](#) takes precedence)

G01T 1/11

- ... Thermo-luminescent dosimeters { (thermo-luminescent compositions [C09K 11/00](#)) }

G01T 1/115

- Read-out devices

G01T 1/12

- .. Calorimetric dosimeters

G01T 1/14

- .. Electrostatic dosimeters (construction of ionisation chambers [H01J 47/02](#) ; { electrometers [G01R 5/28](#) })

G01T 1/142

- ... Charging devices ; Read-out devices

G01T 1/15

- . Instruments in which pulses generated by a radiation detector are integrated, e.g. by a diode pump circuit (pulse rate meters in general [G01R 23/02](#))

G01T 1/16

- . Measuring radiation intensity ([G01T 1/29](#) takes precedence; { self-powered detectors [G01T 3/006](#) ; using an ionisation chamber filled with a liquid or solid, e.g. frozen liquid, dielectric [G01T 3/008](#) })

G01T 1/1603

- .. { with a combination of at least two different types of detector (see provisionally also [G01T 1/16](#)) }

- G01T 1/1606 .. { with other specified detectors not provided for in the other sub-groups of [G01T 1/16](#) (see provisionally also [G01T 1/16](#)) }
- G01T 1/161 .. Application in the field of nuclear medicine, e.g. in vivo counting { (apparatus for radiation diagnosis [A61B 6/00](#)) }
- G01T 1/1611 ... { using both transmission and emission sources sequentially (SPECT imaging [G01T 1/1642](#) ; PET imaging [G01T 1/2985](#) ; detecting hidden objects, e.g. weapons, explosives [G01V 5/00 D](#)) }
- G01T 1/1612 { with scintillation detectors ([G01T 1/20](#) takes precedence) }
- G01T 1/1614 { with semiconductor detectors ([G01T 1/24](#) takes precedence) }
- G01T 1/1615 ... { using both transmission and emission sources simultaneously (SPECT imaging [G01T 1/1642](#) ; PET imaging [G01T 1/2985](#) ; detecting hidden objects, e.g. weapons, explosives [G01V 5/00 D](#)) }
- G01T 1/1617 { with scintillation detectors ([G01T 1/20](#) takes precedence) }
- G01T 1/1618 { with semiconductor detectors ([G01T 1/24](#) takes precedence) }
- G01T 1/163 ... Whole body counters { hand or feet contamination measurement [G01T 1/167](#) ; lung, brain, thyroid, kidney or the like counting [G01T 1/16](#) }
- G01T 1/1635 { involving relative movement between detector and subject; scanning beds (profile scanning [G01T 1/166](#) ; positioning patients, tiltable tables for radiation diagnosis [A61B 6/04](#)) }
- G01T 1/164 ... Scintigraphy (radioisotopes [G21G 4/00](#) ; tracers [G21H 5/00](#) ; { measurement of spatial distribution [G01T 1/2914](#) ; apparatus for radiation diagnosis in different planes [A61B 6/02](#) })
- G01T 1/1641 { Static instruments for imaging the distribution of radioactivity in one or two dimensions using one or several scintillating elements; Radio-isotope cameras }
- G01T 1/1642 { using a scintillation crystal and position sensing photodetector arrays, e.g. ANGER cameras }
- G01T 1/1644 { using an array of optically separate scintillation elements permitting direct location of scintillations ([G01T 1/1645](#) takes precedence) }
- G01T 1/1645 { using electron optical imaging means, e.g. image intensifier tubes, coordinate photomultiplier tubes, image converter }
- G01T 1/1647 { Processing of scintigraphic data (not related to a particular imaging system [G01T 1/2992](#) ; special purpose computers for nuclear physics [G06F 15/52](#)) }
- G01T 1/1648 { Ancillary equipment for scintillation cameras e.g. reference markers, devices for removing motion artifacts, calibration devices (adapted for flow studies [G01T 1/1647](#)) }
- G01T 1/166 involving relative movement between detector and subject ({ scanners in general without using scintigraphy [G01T 1/2964](#) })
- G01T 1/1663 { Processing methods of scan data, e.g. involving contrast enhancement, background reduction, smoothing, motion correction, dual radio-isotope scanning, computer processing (for measuring spatial distribution of radiation [G01T 1/2992](#) ; digital computing or data processing equipment or methods specially adapted for nuclear physics or nuclear engineering [G06F 15/52](#) , e.g. for image data processing [G06F 15/52D](#) ; general purpose image data processing [G06T 1/00](#) ; computerized tomography [G06T 11/003](#)) ; Ancillary equipment (colour printers [G01T 1/1666](#)) }
- G01T 1/1666 { adapted for printing different symbols or colours according to the intensity or energy level of the detected radioactivity (depth discrimination in colour [G01T 1/2985](#)) }
- G01T 1/167 .. Measuring radioactive content of objects, e.g. contamination (whole body counters [G01T 1/163](#))

- G01T 1/169 .. Exploration, location of contaminated surface areas ([prospecting by the use of nuclear radiation e.g. of natural or induced radioactivity G01V 5/00](#)) { [in situ measurement, e.g. floor contamination monitor \(directional detectors G01T 1/2907 \)](#) }
 - G01T 1/17 .. Circuit arrangements not adapted to a particular type of detector { ([pulse-selection circuits H03K](#) , [G01R](#)) }
 - G01T 1/171 ... { [Compensation of dead-time counting losses \(see provisionally also 1/17 \)](#) }
 - G01T 1/172 ... with coincidence circuit arrangements ([G01T 1/178](#) takes precedence; { [combination of detectors, see G01T 1/1603](#) , [G01T 1/30](#) , [G01T 1/361](#) , [G01T 1/36D2](#) , [G01T 1/36D3](#) }) }
 - G01T 1/175 ... Power supply circuits ([power supply circuits per se H02J](#) ; [converters H02M](#))
 - G01T 1/178 ... for measuring specific activity in the presence of other radioactive substances, e.g. natural, in the air or in liquids such as rain water
 - G01T 1/18 .. with counting-tube arrangements, e.g. with Geiger counters ([tubes H01J 47/08](#) ; { [with alarm provision G01T 7/125](#) })
 - G01T 1/185 .. with ionisation chamber arrangements ([construction of ionisation chambers H01J 47/02](#) ; { [gas analysis by ionisation G01N 27/66](#) ; [measuring pressure G01L 9/00](#) ; [leak detection G01M 3/00](#) ; [tele-measurements G08C](#) })
 - G01T 1/20 .. with scintillation detectors
 - G01T 1/2002 ... { [Optical details, e.g. reflecting or diffusing layers](#) }
 - G01T 1/2004 ... { [Scintilloscopes \(fluoroscopes G21K 4/00](#) ; [radiation diagnosis A61B 6/00](#)) }
 - G01T 1/2006 ... { [using a combination of a scintillator and photodetector which measures the means radiation intensity](#) }
 - G01T 1/2008 ... { [using a combination of different types of scintillation detectors, e.g. phoswich](#) }
- WARNING**
- [Pending reclassification, for subject-matter regarding phoswich see also G01T 1/20](#)
- G01T 1/201 ... { [using scintillating fibres](#) }
- WARNING**
- [Not complete, see also G01T 1/2992](#)
- G01T 1/2012 ... { [using stimuable phosphors, e.g. stimuable phosphor sheets](#) }
- WARNING**
- [This group and subgroups are not complete pending reclassification; see also group G01T 1/2992](#)
- G01T 1/2014 { [Reading out of stimuable sheets, e.g. latent image](#) }
 - G01T 1/2016 { [Erasing of stimuable sheets, e.g. with light, heat or the like](#) }
 - G01T 1/2018 ... { [Scintillation-photodiode combination](#) }
 - G01T 1/202 ... the detector being a crystal
 - G01T 1/2023 { [Selection of materials \(see provisionally also G01T 1/202 \)](#) }
 - G01T 1/2026 { [Well-type detectors \(see provisionally also G01T 1/202 \)](#) }
 - G01T 1/203 ... the detector being made of plastics

G01T 1/2033	....	{ Selection of materials (see provisionally also G01T 1/203) }
G01T 1/2036	....	{ Well-type detectors (see provisionally also G01T 1/203) }
G01T 1/204	...	the detector being a liquid
G01T 1/2042	....	{ Composition for liquid scintillation systems }
G01T 1/2045	.....	{ Liquid scintillation quench systems }
G01T 1/2047	.....	{ Sample preparation }
G01T 1/205	...	the detector being a gas
G01T 1/208	...	Circuits specially adapted for scintillation detectors, e.g. for the photo-multiplier section
G01T 1/22	..	with Cerenkov detectors
G01T 1/24	..	with semiconductor detectors (semiconductor devices per se H01L 31/00)
G01T 1/241	...	{ Electrode arrangements, e.g. continuous or parallel strips or the like (constructional or manufacturing details H01L 31/00) }
G01T 1/242	...	{ Stacked detectors, e.g. for depth information } (constructional or manufacturing details H01L 25/00)]
G01T 1/243	...	{ Modular detectors, e.g. arrays formed from self contained units (constructional or manufacturing details H01L 25/00) }
G01T 1/244	...	{ Auxiliary details, e.g. casings, cooling, damping or insulation against damage by e.g. heat, pressure or the like }
G01T 1/245	...	{ using memory cells }
G01T 1/246	...	{ utilizing latent read-out, e.g. charge stored and read-out later }
G01T 1/247	...	{ Detector read-out circuitry (for processing gain or off-set correction H04N) }
G01T 1/248	...	{ Silicon photomultipliers [SiPM], e.g. an avalanche photodiode [APD] array on a common Si substrate }
G01T 1/249	...	{ specially adapted for use in SPECT or PET (SPECT imaging G01T 1/1642 ; PET imaging G01T 1/2985 ; detecting hidden objects, e.g. weapons, explosives G01V 5/00 D) }
G01T 1/26	..	with resistance detectors { (photoresistors H01L 31/00) }
G01T 1/28	..	with secondary-emission detectors (secondary-electron-emitting electrodes in general H01J 1/32) { optionally combined with scintillation counters (secondary emission tubes H01J 43/00) }
G01T 1/29	.	Measurement performed on radiation beams, e.g. position or section of the beam ; Measurement of spatial distribution of radiation (scintigraphy G01T 1/164 ; mass-spectrometers H01J 49/025)
G01T 1/2907	..	{ Angle determination; Directional detectors; Telescopes (prospecting by the use of nuclear radiation, e.g. of natural or induced radioactivity G01V 5/00) }
G01T 1/2914	..	{ Measurement of spatial distribution of radiation }
G01T 1/2921	...	{ Static instruments for imaging the distribution of radioactivity in one or two dimensions; Radio-isotope cameras (using scintigraphy G01T 1/1641) }
G01T 1/2928	....	{ using solid state detectors }
G01T 1/2935	....	{ using ionisation detectors }
G01T 1/2942	....	{ using autoradiographic methods }
G01T 1/295	....	{ using coded aperture devices e.g. Fresnel zone plates (handling of radiation of particles e.g. using diaphragms, collimators, diffraction G21K 1/00) }
G01T 1/2957	....	{ using channel multiplier arrays (channel multipliers H01J 43/18 ; G01T 1/1645 takes precedence) }

- G01T 1/2964 . . . { Scanners (using scintigraphy [G01T 1/166](#)) }
- G01T 1/2971 { using solid state detectors }
- G01T 1/2978 . . . { Hybrid imaging systems, e.g. using a position sensitive detector (camera) to determine the distribution in one direction and using mechanical movement of the detector or the subject in the other direction or using a camera to determine the distribution in two dimensions and using movement of the camera or the subject to increase the field of view ([G01T 1/2985](#) takes precedence) }
- G01T 1/2985 . . . { In depth localisation e.g. using positron emitters; Tomographic imaging (longitudinal and transverse section imaging; apparatus for radiation diagnosis sequentially in different planes, stereoscopic radiation diagnosis) ; (using external radiation sources [A61B 6/02](#)) }
- G01T 1/2992 . . . { Radioisotope data or image processing not related to a particular imaging system; Off-line processing of pictures, e.g. rescanners (for measuring radiation intensity [G01T 1/1663](#) ; digital computing or data processing equipment or methods specially adapted for nuclear physics or nuclear engineering [G06F 15/52](#) , e.g. for image data processing [G06F 15/52D](#) ; general purpose image data processing [G06T 1/00](#) ; computerized tomography [G06T 11/003](#)) }

- G01T 1/30 . Measuring half-life of a radioactive substance { (period meters for nuclear fission reactors [G21C 17/14](#)) }
- G01T 1/32 . Measuring polarisation of particles
- G01T 1/34 . Measuring cross-section, e.g. absorption cross-section of particles
- G01T 1/36 . Measuring spectral distribution of X-rays or of nuclear radiation { spectrometry (pulse selection circuits per se [H03K](#) ; investigation of materials by radiation diffraction [G01N 23/20](#) ; spectrometer tubes [H01J 49/00](#)) }
- G01T 1/361 . . { with a combination of detectors of different types, e.g. anti-Compton spectrometers (intensity measurement with a combination of detectors [G01T 1/1603](#) ; with coincidence circuit [G01T 1/172](#) ; see provisionally also [G01T 1/36](#)) }

NOTE

[G01T 1/361](#) takes precedence over [G01T 1/362](#)

- G01T 1/362 . . { with scintillation detectors (see provisionally also [G01T 1/36](#) , [G01T 1/20](#)) }
- G01T 1/363 . . { with Cerenkov detectors }
- G01T 1/365 . . { with ionisation detectors e.g. proportional counter (see provisionally also [G01T 1/36](#)) }
- G01T 1/366 . . { with semi-conductor detectors (see provisionally also [G01T 1/36](#)) }
- G01T 1/367 . . { with resistance detectors (see provisionally also [G01T 1/36](#)) }
- G01T 1/368 . . { with secondary-emission detectors (see provisionally [G01T 1/36](#)) }
- G01T 1/38 . . Particle discrimination and measurement of relative mass, e.g. by measurement of loss of energy with distance (dE/dx) { (constructional details of semiconductor detectors therefor [H01L 31/00](#)) }
- G01T 1/40 . . Stabilisation of spectrometers { (circuits specially adapted for scintillation detectors [G01T 1/208](#)) }

G01T 3/00 **Measuring neutron radiation** ([G01T 5/00](#) takes precedence; { tubes therefor [H01J 47/12](#) ; circuits with such tubes [G01T 1/18](#) ; measuring short time intervals [G04F 10/00](#) ; measuring pulse characteristics [G01R 29/02](#) ; neutron choppers [G21K 1/04](#)) }

; polarimeters [G01T 1/32](#) })

- G01T 3/001 . { [Spectrometry](#) (see provisionally also [G01T 1/36](#) to [G01T 1/368](#) -except [G01T 1/36D3](#) - , [G01T 3/00](#) ; other sub-groups of [G01T 3/00](#) take precedence) }
- G01T 3/003 .. { [Recoil spectrometers](#) (light-nuclei recoil ionisation tubes per se [H01J 47/1277](#)) }
- G01T 3/005 .. { [Time-of-flight spectrometers](#) (see provisionally also [G01T 3/00](#)) }
- G01T 3/006 . { using [self-powered detectors](#) (for neutrons as well as for Y- or X-rays) , e.g. using [Compton-effect](#) ([Compton diodes](#)) or photo-emission or a (n,B) nuclear reaction ([photovoltaic semiconductors](#) [H01L 31/00](#) ; [photo-tubes](#) [H01J 40/00](#) ; [thermionic generators](#) [H01J 45/00](#) ; [radioisotopic generators](#) [G21H 1/00](#) , e.g. [G21H 1/02](#), [G21H 1/04](#)) }
- G01T 3/008 . { using an ionisation chamber filled with a gas, liquid or solid, e.g. frozen liquid, dielectric ([G01T 3/006](#) takes precedence) }
- G01T 3/02 . by shielding other radiation
- G01T 3/04 . using calorimetric devices
- G01T 3/06 . with scintillation detectors
- G01T 3/065 .. { [Spectrometry](#) }
- G01T 3/08 . with semiconductor detectors ([semiconductor detectors](#) per se [H01L 31/00](#))
- G01T 3/085 .. { [Spectrometry](#) }
- G01T 5/00** **Recording of movements or tracks of particles ([spark chambers](#) [H01J 47/00](#)) ; Processing or analysis of such tracks**
- G01T 5/002 . { using a combination of several movement of track recording devices (detectors associated with recording chambers and only serving to trigger these chambers, see the appropriate groups of the chamber e.g. [G01T 5/04](#) - [G01T 5/08](#) ; see provisionally also [G01T 5/00](#) and other sub-groups) }
- G01T 5/004 . { [Non-electrical readout of multi-wire or parallel-plate chambers](#) ([non-electrical readout in such chambers](#) per se [H01J 47/22](#)) }
- G01T 5/006 .. { by optical methods }
- G01T 5/008 .. { by acoustical methods }
- G01T 5/02 . Processing of tracks ; Analysis of tracks { ([special purpose computers for nuclear physics](#) [G06F 15/52](#)) }
- G01T 5/04 . Cloud chambers, e.g. Wilson chamber
- G01T 5/06 . Bubble chambers
- G01T 5/08 . Scintillation chambers ([discharge tubes](#) [H01J 40/00](#) , [H01J 47/00](#) ; [semiconductor devices](#) [H01L](#))
- G01T 5/10 . Plates or blocks in which tracks or nuclear particles are made visible by after-treatment, e.g. using photographic emulsion, using mica

- G01T 5/12 . Circuit arrangements with multi-wire or parallel-plate chambers, e.g. spark chambers (tubes per se [H01J 47/00](#))
- G01T 5/122 . . { for readout of each individual wires; (readout in such chambers per se [H01J 47/16](#)) ; for processing the output signals }
- G01T 5/125 . . . { by using delay lines }
- G01T 5/127 { by using magnetostrictive delay lines }

- G01T 7/00** **Details of radiation-measuring instruments**

- G01T 7/005 . { calibration techniques (stabilization of spectrometer [G01T 1/40](#)) }

- G01T 7/02 . Collecting means for receiving or storing samples to be investigated { and possibly directly transporting the samples to the measuring arrangement; particularly for investigating radioactive fluids (sampling, preparing specimens for investigation in general [G01N 1/00](#) , [G01N 1/02](#) ; shielded cells or rooms structurally combined with manipulatoin devices [G21F](#) ; measuring of chromatographically separated samples [G01N 30/00](#) to [G01N 30/96](#)) }

- G01T 7/04 . . by filtration
- G01T 7/06 . . by electrostatic precipitation ([G01T 7/04](#) takes precedence)

- G01T 7/08 . Means for conveying samples received { (i.e. sample changers [G01N 35/00](#)) }
- G01T 7/10 . . using turntables

- G01T 7/12 . Provision for actuation of an alarm
- G01T 7/125 . . { Alarm- or controlling circuits using ionisation chambers, proportional counters or Geiger-Mueller tubes, also functioning as UV detectors (measuring radiation intensity with counting tubes [G01T 1/18](#) ; measuring radiation intensity with ionisation chambers [G01T 1/185](#) ; fire alarms actuated by presence of radiation of particles, e.g. of infra-red radiation, of ions [G08B 7/12](#) ; flame monitoring in combustion devices [F23Q 7/00](#) , [F23N](#) ; discharge tubes per se [H01J 47/00](#)) }