

ISO 20785-1:2020 (E)

Dosimetry for exposures to cosmic radiation in civilian aircraft — Part 1: Conceptual basis for measurements

Contents

	Foreword	
	Introduction	
1	Scope	
2	Normative references	
3	Terms and definitions	
3.1	General terms	
3.2	Quantities and units	
3.3	Atmospheric radiation field	
4	General considerations	
4.1	The cosmic radiation field in the atmosphere	
4.2	General calibration considerations for the dosimetry of cosmic radiation fields in aircraft	
4.2.1	Approach	
4.2.2	Considerations concerning the measurement	
4.2.3	Considerations concerning the radiation field	
4.2.4	Considerations concerning calibration	
4.2.5	Simulated aircraft fields	
4.2.5.1	Accelerator-based fields	
4.2.5.2	Cosmic radiation fields on mountains	
4.3	Conversion coefficients	
5	Dosimetric devices	
5.1	Introduction	
5.2	Active devices	
5.2.1	Devices to determine all field components	
5.2.1.1	Energy deposition spectrometers	
5.2.1.1.1	General	
5.2.1.1.2	Tissue equivalent proportional counters	
5.2.1.1.3	Solid-state energy deposition spectrometers	
5.2.1.2	Devices based on the determination of absorbed dose and mean quality factor	
5.2.1.2.1	General	
5.2.1.2.2	The TEPC variance method	
5.2.1.2.3	Recombination chambers	
5.2.1.3	Scintillation counters	
5.2.2	Devices for low LET/non-neutron	
5.2.2.1	Ionization chambers	
5.2.2.2	Geiger Müller counters	
5.2.2.3	Electronic personal dosimeters	
5.2.3	Devices for high-LET/neutron component	
5.2.3.1	Moderated devices	
5.2.3.2	Spectrometers	
5.2.3.2.1	General considerations	
5.2.3.2.2	Neutron spectrometers	
5.3	Passive devices	
5.3.1	General considerations	
5.3.2	Etched track detectors	
5.3.3	Fission foil detectors	
5.3.4	Superheated emulsion neutron detectors (bubble) detectors	
5.3.5	Thermoluminescent detectors	
5.3.6	Photoluminescent detectors	
Annex A	(informative) Representative particle fluence rate energy distributions for the cosmic radiation field at flight altitudes for solar minimum and maximum conditions and for minimum and maximum vertical cut-off rigidity	