SATIF-16 Shielding aspects of Accelerators, Targets and Irradiation Facilities



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Electronic personal dosemeters (EPD) are powerful tools for achieving ALARA (As Low As Reasonably Achievable) objectives in operational radiation protection. These offer real-time reading, time-resolved dose recording, alarm threshold settings and visible/audible alarms to prevent accidental exposures. EPD for photons are well developed and their performances usually comply with relevant Standards. By contrast, a very few commercial models exist for neutrons and their energy dependence is too large for using them without preinformation on the workplace neutron spectrum. Within the INFN-based DOIN (DOsimetro Indossabile per Neutroni) project, a new EPD for neutrons was prototyped, owing to a new patented design. The energy variability of the response is limited to about 2 when the energy varies from thermal neutrons up to the quality of 241Am-Be and monoenergetic reference neutron fields. The calibration coefficient is $\sim 10^{4}$ mSv⁻¹ in terms for H_p (10,0°) for the bare 252Cf source The response is nearly isotropic compared to actual commercial models. Finally, the parasitic photon sensitivity is lower than 2 mSv⁻¹ in the range 48÷205 keV.

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Shielding and dosimetry

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