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Overview of the activities of the WG11 “high energy radiation fields” of EURADOS

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EURADOS (European Radiation dosimetry group) is a non-profit association for promoting research and development and European cooperation in the field of the dosimetry of ionizing radiation. It is organized in various Working Groups among which the WG11 focuses on increasing the knowledge and expertise in field characterisation and dose assessment in various activities where high energy radiation fields are found, like in medicine, research, civil aviation, and space. In addition, the WG contributes to the development of international standards and recommendations (e.g. ISO, ICRU, ICRP). At present, about 80 scientists from 17 countries participates to the activities of the group.

The WG11 is structured in the following tasks:
Task 2 – Instrument response in pulsed fields, focusing on the measurement of radiation fields typical of the state-of-the-art in particle acceleration like free electron lasers and laser driven accelerators. Institutions involved in this task participate to the recently funded EMPIR project 18HLT04 - UHDpulse.
Task 3 – SPE (solar proton events) models and their validation, focusing on comparison of codes assessing radiation exposure of aircraft crew in case of energetic SPEs. The code validation will be done via measurements onboard aircrafts.
Task 4 – SPE measurements and ground-based, focusing on measurements of neutron radiation generated by SPEs. Measurements are on the ground at high altitude (Lomnicky Stit and Zugspitze mountains) and onboard aircrafts.
Task 7 – High energy reference fields, focusing on the characterization of reference radiation fields for the calibration of instruments representative of various workplaces, like the one encountered at flight altitude.
Task 8 – Radiation dose induced by natural electric discharge in the atmosphere, focusing on the measurements of TGFs (Terrestrial Gamma Flashes) produced by photonuclear reactions triggered by lightning discharges.
Task 9 – Elaboration of a procedure to define the primary SPE proton spectra, focusing on correlation between solar particle events and GLEs (Ground Level Enhancements), in the context of radiation exposure at aviation altitudes.
Task10 – Operational procedure for SPE management, aiming at identifying appropriate action levels as well as actions to be taken in case of solar energetic particle events leading to a ground level enhancement and to propose an operational procedure for dose assessment.
Common action WG6, WG9 and WG11 – Benchmark of the MC models used for high energy neutrons. This is a common task developed in collaboration with other working groups. The aim is to identify the sources of uncertainty in the Monte Carlo codes used in neutron dosimetry/spectrometry and how to improve the reliability of the models. The identification of the uncertainties is obtained through Benchmarking Exercises.