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Neutron and Gamma Radiation Monitoring Module for MTCA Applications

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The MTCA.4 is a new standard for control and monitoring systems which gains popularity in many leading High Energy Physics (HEP) experiments around the world. It has been chosen as a new architecture standard for upcoming European X-Ray Free Electron Laser (E-XFEL). The part of control electronics of the new accelerator will be situated next to the main beam pipe and exposed to parasitic gamma and neutron radiation fields generated by the machine. Therefore, knowledge of radiation doses absorbed by electronics is needed. A dedicated for MTCA.4, radiation monitoring module capable of measuring both types of radiation has been designed as a FPGA Mezzanine Card (FMC). It is based on Commercial Off-The-Shelf components and can be applied in any MTCA based system which provides FMC compliant connectivity. For gamma monitoring the RadFET detector was used and neutron fluence measurement is based on SRAM Single Event Upset (SEU) counter method. More detailed information about the module, selected dosimeters methods and obtained results will be presented during the workshop.

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