project symposium

BOOK OF ABSTRACTS

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An improved RADFET-based module with an extended dose range of 1kGy TID based on COTS parts

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An improved RADFET based module dosemeter has been developed by Varadis (a spin out company of Tyndall National Institute in Cork, Ireland) with serial number RM-VT01-A. The module is based on commercially available, commercial-off-the-shelf (COTS) parts and represents an updated version of its predecessor RM-VT01 with an upper dose limit of 10Gy (1 kRad) also based on COTS parts.

The RM-VT01-A module was tested to a total dose of 1kGy (100 kRad) in Co60 field at Vinča Institute of Nuclear Sciences, Belgrade, Serbia. The improved module circuit was specifically designed to address the challenge of withstanding 1 kGy (100 kRad) received dose.

The primary goal of this poster is to present the improvements in the circuit design and working principle. For this purpose, eleven modules were tested, 8 powered and 3 unpowered during irradiation.

The module electronics accommodates both irradiation “sense” and readout “single-current-point” mode, outputting the RADFET threshold voltage (V_T) as a dosimetric information, directly proportional to the absorbed dose.

The output voltage of the module was measured with a simple benchtop voltmeter to demonstrate module operation simplicity and easy system integrability. The experimental data results showed excellent agreement with the dosimetry system used at the Vinca irradiation facility, and calibration data of the VT01 RadFET part.

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