AbstractID: 13704 Title: Use of a rad-hard Si diode in clinical electron beam dosimetry

Purpose: The preliminary results obtained with a MCz silicon diode as on-line clinical electron beam dosimeter are presented in this work. **Method and Materials:** The diode was manufactured by Okmetic Oyj (Finland) and processed by the Microelectronics Center of Helsinki University of Technology in the framework of the CERN RD50 Collaboration. The n^+-p-p^+ junction device used (area of 25 mm^2) was housed in a PMMA probe designed to operate without bias voltage in the direct current mode. During all measurements, the diode was held in a PMMA plate, placed at Zref and centered in a radiation field of 10 cm x 10 cm, with the SSD kept in 100 cm. The device's dosimetric response was evaluated for the 6, 9, 12, 15, 18 e 21 MeV electron beams from a Siemens KD2 Accelerator. The radiation induced current in the diode, for ach electron beam energy, was registered as a function of the exposure time during 60 s for a fixed 300 MU. To study the instantaneous repeatability of the MCZ diode, 5 consecutive current signals were registered for a same radiation dose around of 300 cGy. Measurements were performed with an average dose rate of 5.0 cGy/s for the electron beam energies of 6,9,12,15,18 and 21 MeV. **Results:** The results indicated a linear dose response for doses up to 93,28 Gy for electron beams energies of 6, 9, 12, 15, 18 e 21 MeV with very good instantaneous repeatability (CV better than 2,76 %). **Conclusion:** It worth noting that these results are preliminar and still remains to be investigated this energy dependence, the central axis depth dose response, the long term stability and the radiation hardness of this diode for absorbed doses higher than investigated in this work. All these studies are under way.