

**Purpose:** As MOSFET detectors allow dose measurements in real-time, the interest for these dosimeters is growing. The aim of this study was to investigate the dosimetric properties of these detectors in order to use them for in vivo dosimetry in interventional radiology and for dose reconstruction in case of accident.

**Methods:** Commercially available TN-502RD-H MOSFET detectors (Best medical canada, Ottawa, Canada) were investigated in this study by tests in calibration laboratories. Reproducibility of the measurements, dose response and dose rate dependence of the MOSFET detectors were studied with a Co-60 source and their energy response with continuous X-rays beams. In addition, MOSFETs behaviour has been investigated in pulsed X-rays fields in order to study the influence of the frequency, dose rate and duration of pulses on MOSFET responses. Finally, in order to validate the integrated dose given by MOSFET detectors, MOSFETs and TLD (7LiF:Cu,P) were fixed on an Alderson-Rando phantom in the conditions of an interventional neuroradiology procedure and their response has been compared.

**Results:** The reproducibility of the dose measurements was found to be very satisfying. The response was linear with the dose and no dependency with the dose rate was found. However, relatively strong energy dependence was observed, i.e. a factor of 1.4 was seen in the response between 57 and 79 keV. In pulsed X-rays, the response was correct only for duration of pulses equal to or higher than 10 ms. Good agreement was found between TLD and MOSFET measurements.

**Conclusions:** The results of this study show the suitability of MOSFET detectors for in vivo dosimetry in interventional radiology and for dose reconstruction in case of accident, provided a well-corrected energy dependence and a pulse duration equal to or higher than 10 ms and an optimized contact between the detector and the skin of the patient.