

The purpose of this work was to evaluate specially designed micro- MOSFET detectors for *in vivo* dosimetry inside the bladder and urethra for transperineal permanent prostate implants.

Angular response of the MOSFETS was measured in the 100 kVp orthovoltage beam, which has an effective energy similar to that of the ^{125}I seed and found to be isotropic within 2.5%. Calibration in terms of dose per unit response of the detector was done in a solid water phantom using a special high activity ^{125}I seed

We have performed measurements of the initial post-implant dose rate along the urethras of several patients. For each measurement point, the distance between the MOSFET and the lower edge of the Foley balloon was recorded to provide the reference to the internal bladder wall. The dose rate increased with the distance from the bladder, reaching a maximum inside the prostatic part of urethra. The value of this maximum for different patients ranged from 10 to 16 cGy/hr, corresponding to the total absorbed dose of 205 to 328 Gy. The shape of this dose rate curve can help to evaluate an overall implant quality in terms of the prostate base coverage, the length of prostatic urethra that is being irradiated, and the apex coverage. The *in-vivo* measurements agreed well with the post-implant treatment plan calculations.

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