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POZVÁNKA
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BrachyView: An In-Body Imaging System for Prostate Brachytherapy

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The dosimetric quality of seed implants is a crucial part of the prostate brachytherapy treatment procedure. Incorrect seed placement during or after deployment leads to both short and long term complications, including urethral and rectal toxicity. The BrachyView system is a fast intra-operative planning (IOP) system, providing real-time dosimetric information by acting as an in-body gamma camera. It incorporates three tiled Medipix2 pixellated detectors coupled to a multi-pinhole collimator. Three-dimensional reconstructed images from multiple planar images are used to determine the seed placement in real time. The seed image, when fused with the ultrasound dataset, provides both anatomical and dosimetric information and can overcome the shortcomings of current ultrasound imaging techniques. This paper presents the results of preliminary studies carried out in a PMMA prostate phantom. Monte Carlo models were used to study the limitations of the reconstruction method and to optimise the device geometry. It is demonstrated that the technique provides an effective and practical IOP mechanism for permanent prostate brachytherapy (PPB) treatments

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