

A Monolithic Silicon Detector for pre-treatments verification in Intensity Modulated Radiotherapy

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We report on the development of a large area bidimensional detector, adequate for 2D pre-treatment dose verifications, developed for clinical dosimetry in Intensity Modulated Radiation Therapy (IMRT). The detector is a monolithic segmented sensor obtained by n-type implantation on a 50 μm thick p-type epitaxial silicon layer, with improved radiation hardness against the accumulated dose. The detector is composed by up to nine modules each composed of a matrix of 21×21 pixels with a size of 2×2 mm².

A dosimetric characterization of the detector has been performed and results are compared with those obtained with ion chambers as well as with a matrix of Si diodes (MapCHECKTM, Sun Nuclear). Results show that our modular detector represents a valuable tool for quality assurance in IMRT dose delivery in high precision radiotherapy techniques.