

## The Properties of Beam Intensity Scanner(BInS) in IMRT

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Dose verification is clinically one of the most important parts in the treatment delivery of radiation therapy. Here we present Beam Intensity Scanner(BInS) for the pre-treatment dosimetric verification of two dimensional photon intensity. The BInS is a radiation detector with a Lab-made software for dose conversion of fluorescence signals from scintillator. The scintillator is used to produce fluorescence from the irradiation of 6MV photons. The fluoroscopic signals are obtained by digital video camera-based scintillator will be processed by the Lab-made software to reproduce three dimensional(3D) relative dose distribution. For the intensity modulated beam(IMB), the BInS calculates absorbed dose in absolute beam fluence which are used for the patient dose distribution. Using BInS, we performed various measurements related to IMRT and found the followings: (1) The dose profiles of the IMBs measured by the BInS demonstrate good agreement with radiographic film, pin type ionization chamber and Monte Carlo simulation. (2) The delivered beam intensity is altered by the mechanical properties of the collimating of DMLC and SMLC system. This is mostly due to leaf transmission, leaf penumbra, scattered photons from the geometry of leaf. (3) The delivered dose depends on the operational detail of how to make multileaf opening. Even if the planned dose to a target is equal, the actual delivered dose by DMLC is measured to be larger than that by SMLC due to scattered photons and contaminant electrons at Dmax. These phenomena should be taken into account by the treatment planning for accurate dose calculations delivered to the target volume in IMRT.

Keywords : IMRT, BInS, Dose Verification