

AbstractID: 3050 Title: Evaluation of EBT GafChromic film for external beam dose verification

Purpose: Radiochromic Films are a widely accepted method to measure dose distributions for brachytherapy. Compared to radiographic films they offer a variety of advantages. They are self-developing, almost tissue-equivalent and insensitive to daylight. The films mainly used so far had the disadvantage of a low sensitivity to radiation. The new GafChromic EBT film offers a solution to this problem. The purpose of this paper is to prove the application of this new film for verification measurements concerning IMRT and stereotactic radiotherapy (SRT),

Method and Materials: In order to establish a precise and reliable dosimetric measuring device, it was necessary to investigate the relevant features of the film. After this the films could be applied for dosimetric measurements with 6 MV x-rays using a Siemens Primus linear accelerator. The verification measurements (IMRT and SRT) were done using a μ MLC manufactured by 3D Line in combination with the Primus. The films were placed in our multi-purpose Phantom (EasyCube). After irradiation they were scanned using a flat-bed scanner (MicroTek) and compared with the data provided by the treatment planning system Ergo++ using self-written MatLab routines.

Results: The general properties of the film were determined (eg. response, post-irradiation growth of the OD, energy dependence) and compared with the GafChromic HS and radiographic Kodak EDR-2 films. The response of the EBT is 10-times higher than the response of the HS, which so far was the GafChromic film with the highest sensitivity, and 3-times higher than the response of the EDR-2. The measured dose distributions (IMRT and SRT) were in good agreement with the data from the planning system.

Conclusion: The results of our investigations prove that the EBT is a successful approach for making the advantages of the GafChromic films applicable for external beam radiotherapy.