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High resolution x-ray beam dosimetry using radiochromic films

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The use of radiochromic film for clinical dosimetry is well established, and in principle these films can provide the high spatial resolution dosimetry required for the microbeam x-ray radiotherapy research taking place on IMBL. The spatial resolution of a measurement made with the radiochromic film is typically limited by the densitometry. For broad beam illuminations (> 1 mm) the spatial resolution of photographic quality commercial scanners has been found adequate. However for the higher resolutions required for microbeam radiation therapy (MRT) where beam dimensions are typically 25 microns, the modulation transfer function (MTF) of such scanners has been proven not to be sufficient.
A densitometry method based on using a microscope with a digital imaging system is potentially both rapid and efficient. We have assessed the use of the IMBL inverted microscope which is equipped with a motorised stage and a digital camera, and devised a potential protocol for high resolution film sensitometry and dosimetry.

Keywords or phrases (comma separated)

Dosimetry, Radiochromic Film, Micro beam radiotherapy

Summary

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