

Two Dimensional Radiation Field Mapping using Radiochromic Film

Use of radiochromic film for two-dimensional radiation field mapping is increasing rapidly in the medical field. This film largely satisfies the need for a detection medium which is tissue equivalent, offers a high spatial resolution, does not require a special developmental procedure, gives a permanent record of absolute values of absorbed dose, has acceptable sensitivity, accuracy and precision, and offers ease of handling and data acquisition and analysis. To fully realize these advantages, however, takes some knowledge and experience, which it is the object of this course to impart. To this end, the characteristics of the various types of available radiochromic films will be discussed. While the films require no special handling, there are quite a few “tricks of the trade” which should be known to achieve optimal results. Thus, procedures for using radiochromic films will be covered. Crucial to the optimal use of the films is the equipment used to record the irradiated film density pattern, so the characteristics of available film readout systems will also be discussed. Conversion of the measured film densities into absorbed doses is effected through the proper application of calibration functions, so methods to prepare and use such calibration functions will be covered. The use of radiochromic film for dosimetry mapping has been the subject of a recent AAPM report and the recommendations of the Task Group 55 will be presented and discussed. Finally, some examples of past uses of therapy applications of radiochromic film for two-dimensional radiation field mapping will be reviewed.

Educational Objectives:

1. To familiarize the attendee with characteristics of the various available types of radiochromic film.
2. To cover procedures for using radiochromic films for dosimetry.
3. To discuss methods of radiochromic film readout.
4. To cover methods for calibration of radiochromic film.
5. To discuss precautions and the limitations of the use of radiochromic film.
6. To cover the recommendations of AAPM Task Group 55 on radiochromic film dosimetry.
7. To review some applications of radiochromic film for mapping therapy radiation fields.