

AbstractID: 7548 Title: Use of EBT film for multi-planar dosimetry in homogeneous and heterogeneous phantoms

**Purpose:** This work investigates the use of Gafchromic EBT film for dosimetry in homogeneous and heterogeneous phantoms for static and IMRT fields. This information is necessary for thorough algorithm verification for static and IMRT fields.

**Method and Materials:** EBT film was used to measure dose in three phantom configurations. The first configuration consisted of solid water. The second configuration consisted of 6 cm thickness of lung-equivalent slabs sandwiched between solid water slabs. Film measurements were compared to EDR film and calculations with the Dose Planning Method (DPM) Monte Carlo code. The third configuration, non-slab, consisted of solid water with an 8x10x2 cm<sup>3</sup> lung-equivalent region in the solid water. EBT film was placed perpendicular and parallel to the beam within and between materials. Measurements were made for static fields and sample IMRT fields.

**Results:** When converted to dose, EBT measurements showed good agreement with EDR film. For an example IMRT field, agreement was between 86% and 83% for EBT to EDR and EBT film to DPM calculations comparisons, respectively, using a  $\chi$  evaluation of 2%/2 mm. In the non-slab inhomogeneous phantom, the EBT film clearly showed the effect of disequilibrium at the interfaces.

**Conclusions:** Because EBT film is not light sensitive, EBT film is a practical choice for phantom measurements that require precise placement. In addition, EBT film can be used for measurements parallel to the beam because it is less dependent on the photon energy spectrum. Tentative results indicate that EBT can be used for dosimetry for static and IMRT fields at planes perpendicular to the beam for homogeneous and heterogeneous slab geometries. Results show that the use of EBT film at interfaces is promising in providing dosimetric data to verify dose calculations in previously difficult to measure geometries.