

AbstractID: 11010 Title: Dose Response Characteristics of the New EBT-2 Film for Different Megavoltage Beams

Purpose: We studied the dose response characteristics of the newly introduced EBT-2 radiochromic films for megavoltage photon and electron beams of different energies. **Method and Materials:** EBT-2 films (ISP prototype lot#020609), $2.5 \times 3.2 \text{ cm}^2$, were individually irradiated by 6MV and 15MV photons, and 6MeV and 20MeV electrons (Varian Cl-iX linac) at d_{max} and the center of $10 \times 10 \text{ cm}^2$ field size in a Solid Water phantom (RMI457). The dose range was up to 50 Gy for 6MV photon and 20 Gy for the other three energy modalities. The dose was calibrated against an ion chamber with ADCL calibration. All the films were scanned using Epson 4870 and 10000XL flatbed scanners with 48 bit color (RGB) at least one day after irradiation. The pixel values in a central region of $0.5 \times 0.5 \text{ cm}^2$ in each film were sampled and the mean value was assigned to each film. The optical density and net optical density (NOD) values for each film were determined from the mean pixel value. **Results:** The NOD values for the red, green and blue channels were plotted against the doses for each energy modality. The curves from the Epson 10000XL and 4870 scanners were also compared. The dose response curves of the new EBT-2 films were found to be quite similar for the four megavoltage beams and similar to those of EBT film. For dose of 20 Gy, the NOD values from Epson 10000XL were about 1.6, 1.4 and 0.8 for red, green, and blue channels, respectively. **Conclusion:** The dose response characteristics of the newly introduced EBT-2 films have been studied for four megavoltage photon and electron beams, and found to be similar to the predecessor, EBT films. The new EBT-2 films are expected to be feasible for 2D dosimetry applications. **Conflict of Interest:** Prototype EBT-2 films were provided by the International Specialty Products.