

AbstractID: 1203 Title: Comparison of Sun Mapcheck Diode array to film+chamber dosimetry for IMRT QA

In order to evaluate the Sun Mapcheck diode array for IMRT dosimetric verification, measurements of the response of the array were made with for IMRT plans for treatment of breast, prostate, and head & neck cancers. The plans evaluated with the Mapcheck device had previously been analyzed with a combination of film dosimetry analyzed with RIT113 software and the dose to an ionization chamber placed at isocenter. For the three plans analyzed, doses to chamber were all within 4% of the predicted dose from the treatment planning system, and the doses to the central axis of the film were also within that margin. Overlay of the treated and planned isodose lines also met the evaluation criteria. For the plans delivered to the Mapcheck device, the doses to a diode in a low dose gradient region showed agreement for a composite of all fields in the treatment plan within 3%. However, for the individual gantry angles within a total treatment plan the variation between the measured and calculated doses was up to 13% for some fields delivered. The Mapcheck software does not allow the overlay of measured and calculated isodose lines. Analysis of the beam profiles in the Mapcheck software shows good agreement between the measured and calculated plans in regions of adequate diode granularity and low dose gradients. However, IMRT plans can have high dose gradients in regions of low detector granularity, complicating the analysis. Film dosimetry that is properly performed inherently does not have this weakness.