

**AbstractID: 11731 Title: Patient-specific QA of intensity-modulated arc therapy with 2D diode array: Initial experience**

**Purpose:** New rotational intensity-modulated radiation therapy (IMRT) or intensity-modulated arc therapy (IMAT) techniques using single or multiple arcs are attaining widespread adoption in clinic due to their superior delivery efficiency. This study evaluates the use of a 2D diode array for patient-specific QA for such techniques with the Varian RapidArc™.

**Method and Materials:** A RapidArc plan conforming to the clinical standards was generated for each case using Eclipse treatment planning system (Varian Medical Systems, Palo Alto, CA). A verification plan was subsequently created for each of the treatment plans with the water-equivalent MapPHAN™ QA phantom, with the MapCHECK™ (Sun Nuclear Corporations, Melbourne, FL) embedded at 5 cm depth, measuring the coronal dose plane in integration mode. Twenty-one cases were selected in this study including 2 brain, 11 head-and-neck (HN), 4 prostate, and 4 whole pelvis cases. The measured 2D dose distributions were then compared to that calculated by Eclipse using (i) gamma analysis with the acceptance criteria of 3%/3mm, and (ii) absolute point dose difference.

**Results:** For all cases, the average passing rate for the gamma analysis was 98.2% (range: 95.3% - 100%) and the absolute point dose difference was 2.1% (range: 0%-3.9%). The total time taken for the QA process was approximately 10 - 15 minutes, including setup, plan delivery, and online analysis.

**Conclusions:** Preliminary results have shown that a 2D diode array is an efficient method for RapidArc patient-specific QA, proving that the MapCHECK/MapPHAN is capable of performing both absolute and relative dose comparisons with a satisfactory accuracy for clinical practices.

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