

**Purpose:** To investigate the limitations of patient-specific QA (quality assurance) procedures in IMRT plans for H&N and prostate cancer patients.

**Method and Materials:** The detector array with 445 solid states diode detectors has been used to verify dose distributions obtained by a commercial RTP. The IMRT plans were generated using the Helios optimization algorithms with sliding window technique. It was calibrated according to the manufacturer-recommended calibration procedure. Then, it has been used to investigate (1) the accuracy of dose distributions with rectangular collimator settings, (2) a single field IMRT plan was generated to deliver uniform dose to a thin (2mm thick) square target imbedded in the center of the 30cm\*30cm\*30cm phantom, and (3) the patient-specific QA procedures for patients with prostate and H&N cancers.

**Results:** (1)The differences between the plan and the measurements that are larger than “+/-3%” for conventional rectangular collimator settings were observed along the X-axis. (2) The penumbras of a IMRT plan with a single field as a part of annual RTP QA routine procedure were investigated and the results were the same as the first case. These dose differences showed similar statistics as the case one. (3) With routine IMRT plan with 8 fields setup, the dose differences (the same definitions as above) shows the similar statistics as those of the second case, but observed to 94% -97% passing rate (with +/-3mm DTA and +/-3% criteria).

**Conclusion:** The limitations of the detector arrays are investigated and its effects upon the overall passing rates with the same criteria are found to be 3%-7%. But, the dose at the central axis of the routine treatment plans are within “+/- 2%” except in very special cases where the CA is very close to the high dose gradient regions.