

**Purpose:** To evaluate the performance of an in-house laser CT scanner and study its usefulness for dose verification in IMRT.

**Methods and Material:** A laser CT scanner has been developed based on the principle of a first generation X-ray CT. This scanner consists of an aquarium, a turntable with angular graduation, photodiode as detector and laser as light source. The laser is swappable between a red laser and a green laser. The laser attenuation data acquired using a data acquisition board and a Personal computer is reconstructed using IRADON function implemented in MATLAB. The spatial accuracy of measurement, resolution and reproducibility of the scanner were investigated in this study. The spatial accuracy of the scanner was verified by scanning needles placed in phantom with known geometry. A capillary tube with 1mm bore was scanned to check the resolution of the scanner. Calibration was performed by exposing the gel for a few known doses. Three IMRT plans were verified using normoxic polymer gels and the dose distribution were compared with that of the treatment planning system.

**Results:** The spatial measurement accuracy of the scanner was one millimeter. The scan of the 1 mm capillary showed that the resolution of the scanner was 1 mm. The repeated scanning of a gel produced identical results suggesting that the dose mapping with the scanner is reproducible. The dose distribution obtained with gel measurements agree with the treatment plans within the 5%-3mm.

**Conclusion:** The performance of laser CT scanner developed in-house has been found to be adequate for reading dose distribution embedded in gel. The comparison of the IMRT plans showed that it could be used for patient specific quality assurance of IMRT plans.