

AbstractID: 5666 Title: In-vivo diode dosimetry for IMRT fields

Purpose: In-vivo dosimetry can be a useful tool to verify overall patient treatment quality with respect to calculation, setup and delivery. We have conducted a study in our department using the Sun Nuclear QED diode detectors to verify the accuracy of dose delivery in patients undergoing IMRT treatments. The expected diode reading calculation is based on an in-house developed MU calculation program.

Method and Materials: The diodes were placed on the surface of a 4 cm thick solid water phantom and the IMRT fields were delivered to the assigned SSD under treatment conditions. We compared the diode dose readings during the IMRT treatment delivery with the calculated entrance dose in the Penn MU program. The results were also compared with the Dose/MU ratio between PennMU and Oncentra treatment planning system (OTP).

Results: A large number of cases were selected and 73 IMRT fields were checked. The calculated values were in 8% agreement with the diode readings. The magnitude of error is dependent on the diode position in the delivered field, whether it is located in a high or low dose region. Shifting the diode position to a high dose region lead to improved accuracy.

Conclusion: Penn MU calculation program and the diode measurements are within 8% agreement and we expect our MU calculation program to be clinically used as a reliable tool for verification, keeping in mind that the diode point of measurement should be in a high dose region to avoid large errors.