AbstractID: 13574 Title: Monte Carlo commissioning of BrainLab SRS cones on a NovalisTX

Purpose: To commission a Monte Carlo model of the high dose rate 6MV photon beam of the Varian NovalisTX linear accelerator for patient dose calculations.

Methods and Materials: The high dose rate 6 MV beam on the Varian NovalisTX accelerator is utilized for stereotactic radiosurgery (SRS) treatment. The SRS beams are confined by cone collimators and the available collimator sizes range from 5 and 10 to 30 mm, in every 2 mm increment. Furthermore, the linear accelerator is equipped with multileaf collimator with MLC leaf width of 2.5mm. It is necessary to investigate an accurate and detector independent method for the narrow beam output factor measurement. In this study, the beam data was collected using a microLion chamber (vol. 0.002cc) and used to commission the linac model and all the SRS cones. Film measurement were used to measure the MLC transmission and leakage.

Results: Monte Carlo results are found to be in excellent agreement with the measurements for the open, and cone beam fields. Measured output factors were in agreement with Monte Carlo results but there was a discrepancy against the the VARIAN recommended output factors measured directly by Wellhöfer CC01 chamber and Scanditronix photon field diode which are consistently higher for all the cones.

Conclusions: A Monte Carlo model of the NovalisTX high dose rate SRS beam has been created that is able to simulate the beam with high accuracy. Beam parameters that are otherwise difficult or detector dependent can be determined using the Monte Carlo method.