

AbstractID: 8978 Title: A Feasibility Study of a Monte Carlo Based Dose Verification for a Therapeutic Proton Beam Delivery System

Purpose: In order to investigate the possibility of the Monte Carlo based dose verification for a therapeutic proton beam delivery system installed at National Cancer Center, Korea (NCC). **Method and Materials:** The precise modeling of a therapeutic proton beam delivery system and the accurate evaluating of its initial beam characteristics were the primary prerequisite to virtually reproduce a real irradiation. Using the GEANT4.8.2 toolkit, we have implemented the nozzle elements along with the beam delivery path, including the movable components in time and space to produce Spread Out Bragg Peaks (SOBP) and uniform lateral-dose distributions in the scattering mode. The Magnet fields, which vary in X-Y direction, also have been realized in our simulation environment for the wobbling mode. **Results:** We have obtained simulation data that showed a good correlation to the measured dose distributions in several treatment conditions. **Conclusions:** The results present that when the Monte Carlo commissioning for the overall treatment range are completed we will be able to make practical application of the Monte Carlo simulation as an auxiliary tool for dose verification in addition to standard measurements.