AbstractID: 13243 Title: Feasibility of using a multi-array ion chamber detector for Daily QA in protons therapy

Purpose: Feasibility of using a multiarray detector system for daily quality assurance checks in proton therapy. **Method and Materials:** The daily dose output of the passive scattering beamline for one range modulator wheel (RMW) is measured at 4 different locations along the depth (proximal, center and distal to the plateau and at the end of particle range) using a 2D-multiarray detector system (Starcheck, PTW Freiburg, Germany). Different depths were generated along the SOBP by using a dedicated compensator. The flatness and symmetry of the beam were measured by irradiating the detector using a 15x15cm^2 aperture without the compensator. **Results:** The diagonal profiles of the high-energy medium-scatter RMW were measured. The central part of each profile is influenced by scatter from the thicker part of the compensator into the thin proximal area. Therefore, the average dose value is determined 50 mm from the center by averaging the readings of 8 ion chambers. The dose output is in agreement with those from the commissioning data. This QA dosimeter system has a rather good reproducibility. The maximum relative deviation from the average measured dose with this system was 2.3% for all data, except for the end of range location. By using the ICRU78-protocol, the symmetry and flatness was determined to be 0.23±0.07% and 1.8±0.2% respectively, which are within acceptable tolerance limits for this energy. **Conclusion:** The Starcheck with the dedicated compensator offers several advantages over conventional single point measurement with one ionization chamber for daily QA, namely, the ability to measure the depth dose and flatness and symmetry using the same device quickly. The use of this system allows both an independent flatness and symmetry check to be performed on a daily basis without increasing the time and efficient QA checks for all the RMWs used clinically.