AbstractID: 5632 Title: Evaluation of a Volumetric Display for Radiation Therapy Treatment Planning

Purpose: To evaluate an innovative volumetric display for radiation treatment planning applications. **Method and Materials:** A volumetric, auto-stereoscopic display (Perspecta Spatial 3D, Actuality-Systems Inc., Bedford, MA) has been integrated with the Pinnacle^3 TPS for treatment planning. The Perspecta 3D display renders a 25 cm diameter volume that is viewable from any side, floating within a translucent dome. In addition to display all the 3D data exported from Pinnacle, the system provides a 3D cursor and beam placement tools. A 125 point, 5 cm spaced grid centered at isocenter was created in Pinnacle and transferred to Perspecta. A Perspecta 3D ruler verified distances between any two points on the 3D grid. Ten teletherapy beams with various gantry/couch combinations were generated on Pinnacle and verified on Perspecta display. Doses at the same grid points were also compared. CT images from a QUASAR phantom in 3 orientations were used on Perspecta to confirm beam field size, divergence, etc. **Results:** In general, the Perspecta system accurately depicted all 3D data exported from Pinnacle. When measured by the 3D ruler, distances between any two points using Perspecta agreed with Pinnacle within the measurement error (typically <0.5 mm). Beam angles were verified through Cartesian coordinate system measurements and also upon rotating the phantom. Field sizes, collimator angles, and beam divergence were similarly confirmed. Isodose surfaces and dose values chosen at arbitrary locations in Perspecta agreed with Pinnacle within ± 2% in an absolute sense, which was governed by human error in coinciding the points. **Conclusions:** These preliminary results indicate that the Perspecta device is capable of displaying consistent data from the Pinnacle radiotherapy treatment planning system, and may become a valuable tool for visualization and quantitative evaluations in radiation oncology. **Conflict of Interest Statement:** Actuality Systems Inc. provided the 3D display used in this study.