AbstractID: 1167 Title: Characterization of PaxScan 4030 a-Si flat panel imager in direct acquisition mode for use as relative dosimeter for pretreatment IMRT verification

Accurate relative dosimetry is essential for IMRT pretreatment verification. For complicated cases a single point dose measurement per field is often performed. This time consuming process does not reflect the overall 3D dose distribution, and is very sensitive to the positioning errors. An alternative method would employ comparisons of measured in-phantom 2D dose maps with the dose distributions calculated with treatment planning system (TPS) for the same conditions. Most common way of obtaining 2D dose map in phantom is with X-ray sensitive film. Previously some work was reported on using an in-house built a-Si flat panel imager as a relative dosimeter*; however it had limited clinical application due to the proprietary design. This work was done with commercially available Varian PaxScan 4030, in high kV configuration with the fluorescent screen removed. High resolution, large format, commercial availability and ease of modification make this device an attractive alternative for regular film. Availability of the Software Development Kit from the capture card manufacturer adds flexibility in the range of acquisition modes and post-acquisition processing. In this work PaxScan 4030 response to the Megavoltage external beam was characterized as a function of multiple parameters. The derived corrections were used to convert 2D images of treatment fields acquired with the device in the phantom configuration to dose maps. There is a good agreement between dose maps obtained this method, X-ray film and calculated by TPS.

* T. Nurushev, et al. AAPM 2001, and AAPM2002 annual meeting oral presentations.