

AbstractID: 10145 Title: Method for and results from a EPID based IMRT QA for the Siemens Artiste

**Purpose:**

To demonstrate a method for and show results from an individual IMRT plan verification setup for the new Siemens Artiste therapy unit.

**Method and Materials:**

To gain maximum information, during a total plan verification measurement in a cylindrical phantom containing a PTW 729 chamber array, exit dose distributions are recorded simultaneously using the Siemens Artiste's amorphous silicon flat panel imager (FPI) and stored in multi-frame dicom files. While results from the PTW 729 array can be easily compared to the calculated phantom plan, considering the anisotropy of the array, FPI data and the inverse planned fluence distributions have to undergo a series of corrections. These are eliminating absorption in the phantom by gantry angle specific reference images and sensitivity changes of the detector for off axis fields as well as for path length related changes in scatter resulting from the cylindrical phantom. Scatter is applied to planned fluence by an algorithm, which also includes MLC leakage and detector blurring. These corrections are done by an IDL software tool, also allowing evaluation of the fluence distributions by profiles, difference maps, Gamma-index as well as leaf position comparisons.

**Results:**

For the first 100 IMRT verifications, including 842 beam directions and 118872 leaf positions, statistic evaluations showed a positioning accuracy of .5mm for 87.8% and 1.0mm for 97.9% of the leaves. Although corrected for, detector misalignment is also enclosed in these numbers. 94.2% of the fluence distributions fulfilled a 1mm, 5% off maximum gamma criteria.

**Conclusion:**

This verification procedure is reliable and highly effective as is the delivery system. Therefore results may question the necessity of this verification procedure. Draw back is the limit in field size given by the dimensions of the flat panel detector as well as the impossibility to do non coplanar beams.

**Conflict of Interest (only if applicable):**