AbstractID: 13007 Title: Two Years of Clinical Experience with DAVID - a Translucent Multi-Wire Detector for On-line Verification of Patient Treatments

Purpose: The DAVID system is used as an independent monitor system positioned between MLC and patient to assure the correct application of IMRT deliveries. In this work we report on our two year clinical experience with the system and will discuss detected treatment deviations and errors.

Material and Methods: The DAVID system (PTW-Freiburg, Germany) is a translucent multiwire transmission ionisation chamber, placed in the accessory holder of the linear accelerator. Each detection wire of the chamber is positioned in the projection line of a MLC leaf pair, resulting in a signal proportional to the line integral of the ionisation density (MLC opening).

After the dosimetric verification of an IMRT plan, the values measured by all detection wires of the system are stored for each segment as reference values. During daily treatment the signals are re-measured and compared to the reference values. A visual display of the readings and reference levels allows a fast overview about the correctness of the irradiation. Additionally a warning occurs if the predefined deviation level is exceeded.

Results: The system is especially useful for all cases in which the MLC reproducibility is an issue such as in highly complex treatment deliveries. The permanent visual display of the signal in the control room has been established in our clinic as a reliable and fast tool, helping to identify errors that might not have been detected without this method. So far our experience with the system is based on the verification of approximately 50 IMRT plans with a total irradiated number of more than 60.000 sub-segments over approximately 2 years. The main recorded deviations have been drifts of the linear accelerator output as well as block-jaw and MLC decalibrations. In one case lost MLC segments resulting in a possible irradiation of open fields have been detected.