AbstractID: 6791 Title: Performance of the DAVID system in clinical routine

Purpose:
In [1] we introduced the DAVID system which is able to perform permanent in vivo verification of IMRT photon beam profiles. Results of the applications of the DAVID system during daily irradiations will be presented.

Methods and Materials:
The DAVID system is a flat, translucent multiwire ionisation chamber, placed in the accessory holder of the Linac. Each of the detection wires is positioned in the projection line of a MLC leaf pair. The signal of each wire is proportional to the line integral of the ionisation density along this wire. During the dosimetric verification of an IMRT plan, the values measured by the detection wires are stored as reference values. During daily treatment the wire signals are re-measured and compared to the reference values. To introduce the system into clinical routine, standard cases have been irradiated for a typical number of fractions without the patient in the beam. By this we had the possibility of introducing artificial errors (like de-calibrated MLCs or neglected IMRT segments) and of analysing their detections.

Results:
The system proved itself as an easy-to-handle sensitive device for in-vivo verification. Clinical relevant errors due to decalibrated MLCs or neglected IMRT segments could be detected. The set-up time for the system, preceding the first measurement of the day, is less than five minutes, so that a minimum amount of additional time is needed during the morning check of the linear accelerator.

Conclusions:
The DAVID system was introduced into the daily routine without any problems.

[1] B. Poppe, C. Thieke, D. Beyer, R. Kollhoff, A. Djouguela, A. Rühmann, K. C. Willborn, D. Harder. DAVID-a translucent multi-wire transmission ionisation chamber for in vivo verification of IMRT and conformal irradiation techniques. Phys Med Biol 51:1237-48 (2006)

Conflict of Interest:
The work was performed in collaboration with PTW-Freiburg.