

AbstractID: 7215 Title: Amorphous Silicon based Electronic Portal Imaging Device (aSi-EPID) in routine QA procedures for dynamic IMRT technique

Purpose: To improve the methods applied for evaluating mechanical parameters involved in routine QA for dIMRT, using a series of in-house developed tests which apply the aSi-EPID as main tool for verification.

Methods and Materials: All measurements were performed using a Linac with energy of 6 MV, equipped with an amorphous silicon imager and a collimator of 120 leaves. The tests were produced using leaf sequence files created in a MLC SHAPER software and transferred to the machine by connection to a USB port. In the comparison procedures, the dosimetric measurements were done with a Farmer type Ionisation Chamber (IC), connected to an Electrometer used in charge mode. For film measurements, films were placed in a phantom for irradiation, and optical density values to define profiles were obtained using a digital transmission Densitometer. All the tests were performed using the EPID positioned at 180 cm from the source, in order to avoid the effect of saturation in the imager.

Results: In this work is shown that the main advantage of applying the EPID for routine QA is the reduction of time required for data acquisition and analysis. The data acquired using the EPID provides information equivalent to that acquired with more laborious conventional methods. Furthermore, it produces digital portal images which have some of the important characteristics of other methods. The results obtained using the aSi-EPID show good agreement with film and I.C, while giving better consistency and reproducibility.

Conclusions: Using the EPID of the Linac, it is possible to evaluate the mechanical parameters of the MLC quickly and accurately. From the results presented, although its detection system is not water equivalent, the aSi-EPID is an efficient tool for routine IMRT QA, being a faster method than conventional QA used in dIMRT.