

EPID and Quality Assurance of the Linac

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Introduction

The quality of the EPID has to be checked periodically to follow the values of contrast, noise and resolution qualifying the EPID images. The subject of that paper is another aspect of using an EPID: It concerns the quality assurance (QA) of the linac itself.

Material and Methods

In Fribourg, two Varian Clinac 2300 CD (they are for local convenience called Jaune for the #114 and Orange for the #511) are installed. Both have the PVI and MLC (80 leaves). Defining two different patients called "Mensuel Jaune" and "Mensuel Orange" and all the necessary plans and fields in the ARIA system, it rests to make some appointments for that two "particular patients" on the respective machine. Then the physicist or MTR have just to "treat" them according to instructions. An off-line analyze of the acquired images will bring a full bunch of information about the calibration of the PVI arm, the position of the isocenter relative to the lasers, the precision of rotation for the collimator, the positioning of jaws and individual leaves as well as the dose calibration of the PVI (used for IMRT checks).

Results

The Winston-Lutz test, the evaluation of the center of aS500 matrix, the precision of rotation of the collimator, the individual jaws and leaves positions, the stability of the machine at 1 or 2 MU regarding the profile in transverse and radial direction and a lot of other results will be presented for both machines. The human time invested to produce the PDF report for each month is perhaps the most impressive parameter in that project. All the evaluation system is based on open source tools. That allows every medical physicist to implement a similar solution at no costs excepted the local implementation time.

Discussion

This system is used for more than years in Fribourg. It was gradually improved and still will be in the future. The presented work will show the gain of time for periodically testing the linac according to the SGSMP recommendation #11^[1].

References

- [1] SSRMP, Recommendation #11, Quality Control of Medical Electron Accelerators (2003)