
Current uses of log files in the radiotherapy quality assurance workflow for IMRT and VMAT techniques

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Résumé

Introduction: During IMRT and VMAT treatment, radiotherapy systems record actual axis information such as gantry/collimator angles, leafs and banks positions and MU delivered. After the treatment is completed, this information is stored to a log file. It allows users to compare planned and delivered data for each parameter. For the purpose of IMRT/VMAT quality assurance (QA), these files are of great interest and are increasingly used.

Methods: This presentation gives an up-to-date overview of the uses of log files. After a short introduction on the content of log files and their potential limitations, current applications and software available are presented. Next, feedback of the author in the day-to-day running of his medical physics department is presented. Finally, perspectives in log files usability are considered.

Results: Log files allow quantifying MU and axis deviations relative to the DICOM RT Plan. In troubleshooting issues, logs can help finding where the problem might come from. As a pre-treatment quality control tool, quantified deviations allow comparison with control limits, and then ensure that the machine has correctly interpreted the DICOM RT plan. Another application would be the comparison between delivered 3D dose calculated from log files in the patient CT (or CBCTs) with the prescribed treatment plan. Extensive application would be to correlate modulation indexes calculated from the DICOM RT Plan with log files deviation in order to optimize QA process.

Conclusions: Log files are complementary to measurement-based QA method. Knowing their limitations, they provide useful mechanical and dosimetric information that can be used for fixing issues. They can also be employed in the (pre)treatment QA process.

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