

AbstractID: 14039 Title: DynaLog File Analysis for IMRT Delivery Verification

Purpose: To develop a method based on the analysis of the Varian DynaLog files as part of the routine IMRT QA procedure. **Method and Materials:** The DynaLog files of a Varian Millennium MLC were analyzed using an in-house software. The expected and actual locations of each MLC leaf at a number of time intervals were extracted from the DynaLog files and were used to calculate the expected and delivered fluence maps. A pixel-by-pixel Gamma-comparison consisting of leaf position deviation and fluence discrepancy between the expected and the delivered values was performed. A pixel is accepted to pass this Gamma-test if the leaf position deviation is within 1.0 mm at the plane of the isocenter and the fluence discrepancy is no greater than one dose fraction. A pass rate (R_p) is defined for each IMRT field as the ratio of the number of pixels that pass the Gamma-test to the total number of pixels. Retrospective studies of 183 patients with various forms of cancers who underwent IMRT were carried out. A total of 45,270 individual IMRT fields were analyzed. **Results:** More than 99.9% of the 45,270 IMRT fields showed $R_p > 95\%$, indicating excellent agreement between the delivered and the expected IMRT leaf positions as well as the dose fractions for the cases studied. Detailed investigation of the few fields that showed lower than 95% pass rate is underway. **Conclusion:** This work indicates that the information stored in the DynaLog files of the Varian MLC system can be exploited and used as a part of the routine IMRT QA. Furthermore, when integrated within the record and verify system, it may be used to alert whether an IMRT plan is being delivered correctly real-time.