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Evaluation of treatment planning systems using in-house software “Eat Pie”

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Introduction:

Usually, neither treatment planning systems (TPS) nor water phantom related software is capable of comparing measured and calculated data by means of dose difference or gamma index. Microsoft Excel is an option, but for a large amount of data analysis can become quite cumbersome. For this reason we created a software called “Eclipse Analysis Tool with Pinnacle Extension” (EAT PiE)

Methodology:

Using Python 3.4 and QT 4, we created a software which is able to read profile data (percentage depth dose (PDD) and profiles) from Varian Eclipse 11 and 13, Philips Pinnacle 9.8 and the PTW Freiburg Mephisto water phantom software. Those curves can be compared among each other by means of dose difference and gamma index, respectively.

Results:

We found good agreement between Eclipse calculated data and measured data using 1mm/1% and 2mm/2% local gamma criteria.

We found good agreement between Eclipse calculated data and Pinnacle calculated data using 1mm/1% and 2mm/2% local gamma criteria

We now have the possibility to compare different algorithms (e.g. AAA, Acuros XB, Pinnacle Adaptive Convolve) in a water phantom or from real patient calculations as well as different detector types

Conclusion:

EAT PiE can help evaluating and commissioning a Treatment Planning System, new algorithms or new versions of an existing system. It can also be a useful tool in plan comparisons among different treatment planning systems or different algorithms in one planning system. Even measurements with different types of detectors can be compared using the gamma index method and dose difference analysis.

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