

5. Conclusions & Recommendations

5.1 Conclusion:

Although it is acknowledged that the general aim must be to have good agreement between dose calculation and the actual dose value, e.g. within 2% or 2 mm, current day algorithms and their implementation into commercial treatment planning systems result often in larger deviations. A high accuracy can at present only be achieved in relatively simple cases. The new set of tolerances and the quantity confidence limit have proven to be useful tools for the acceptance of photon beam dose calculation algorithms of treatment planning systems.

The measured beam and dose profiles data collected from Varian Medical Linear Accelerator were found to be in a good agreement with the calculated data obtained from the PlanW2000 TPS. The comparison between the calculated and measured dose point in the central axis and off-axis showed a good agreement with an average value less than $\pm 2\%$. All the dose points for verification were made at depths greater than the depth of maximum dose. The accuracy of dose calculation is due to the accuracy of the PlanW2000 TPS Pencil beam Calculation Algorithm.

The comparison between calculated and measured depth doses and beam profiles for both open and wedged fields for different field sizes in both regions of useful beam and penumbra showed a good agreement with maximum deviation of 1%.

Dose calculation for the 6 MV Photon beam using the PlanW2000 TPS based on pencil beam model is generally in excellent agreement with measurements. The conclusion of the work done during this research showed that the implementation of a pencil beam based TPS PlanW2000 system was found suitable to be used for radiotherapy Linear accelerator manufactured by Varian medical system.

5.2 Recommendations:

- The implementation of the PlanW2000 TPS to be tested for a different types of Medical Linear Accelerator.
- Test the PlanW2000 TPS calculations for the different Electron Energies.
- Test The PlanW2000 TPS calculation for high photon beam Energies.