

AbstractID: 13130 Title: A method of using Ir192 brachytherapy system to check the constancy of PTW 2D-Array seven29 ion chambers

**Purpose:** To evaluate the feasibility of constancy check of PTW 2D-Array seven29 ion chambers by Ir-192 HDR Remote after loading system and to provide a method of checking 2D-Array performance that ensures the results of IMRT routine QA is reliable.

**Method and Materials:** We used Nucletron microSelectron HDR brachytherapy system which has an Ir192 source and well control of source position. By matching the markers on the surface of PTW 2D-Array seven29 and the Nucletron source position checking tube, we collected each ion chamber's reading row by row. We adjusted the influence of Ir192 decay by mathematical calculation. By comparing the measurement data with calibration file from PTW Company and analyze data by EXCEL Macro Enterprise, we can evaluate the performance of each ion chamber.

**Results:** The average of total measurement time was 162.97 mins, including setup and measurement time. And in 2 hours spans, the influence of Ir192 decay is 0.078%. The 729 ion chambers performance grouped into five types :< 1%, 1-2%, 2-2.5%, 2.5-3%, >3%. There have 8 ion chambers under1%, 692 ion chambers in 1-2%, 22 ion chambers in 2-2.5%, 4 ion chambers in 2.5-3% and 3 ion chambers over 3%.

**Conclusion:** This study provides a method to check the constancy of PTW 2D-Array seven29. By this method, we can check this IMRT QA tool's performance in hospital. Moreover, we can save time and money in order to send this whole package to Germany Calibration Center.