

AbstractID: 3913 Title: Evaluation of the new Exradin A16 micro-chamber for the purpose of water measurements of small SRS collimator by comparison to film dosimetry and Monte-Carlo calculations

**Purpose:** Direct water measurements of small fields in general and small SRS collimators in specific have been a long known problem. The typical ion chambers, which are used with 3D water phantoms have a volume of about 0.125cc, which is not suitable for measuring small fields. The recently introduced Exradin A16 chamber, with a volume of 0.007cc was designed to overcome the problem by allowing accurate measurements of small fields in water. The purpose of this work is to validate the suitability of this chamber for small fields water measurements.

**Method and Materials:** In order to evaluate the suitability of the A16, depth dose curves and a set of profiles were taken with this ionization chamber using SRS collimators ranging from 1cm to 4cm in diameter, in steps of 0.25cm increment. The scans were then compared with film dosimetry of the same collimators and Monte-Carlo simulations. The films used were the Kodak XDR extended range films in Perspex phantom, which were scanned and analyzed using the Vidar 16 scanner and the RIT software. The Monte-Carlo simulation was done using the BEAMnrc code. For the larger collimators (2.5cm and up) a set of water measurements were performed also using the standard Wellhoffer chambers (0.125cc)

**Results:** The result showed excellent matching between all evaluation media (water measurements with the A16 and the standard chamber, film dosimetry and Monte-Carlo simulation). The only discrepancy was with deeper depths in the films, which was due to the phantom used.

**Conclusion:** The A16 is suitable and should be used for small field water measurements.