

# DETERMINATION OF ABSORBED DOSE WITH AN EXTRAPOLATION CHAMBER IN BETA RADIATION FIELDS

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## Abstract

Beta Secondary Standard (BSS) systems are operated and maintained by metrology laboratories to provide calibration of dosimeters used for radiation protection purpose. However, calibration in BSS systems must be done at standardized and limited geometric conditions; other conditions require a primary dosimeter to characterize the non-standard radiation fields. This work is part of the characterization the <sup>90</sup>Sr/<sup>90</sup>Y, <sup>85</sup>Kr and <sup>147</sup>Pm beta radiation fields of the BSS2 system with a 23392 model PTW ionization chamber that uses the extrapolation to null volume as an absolute method for absorbed dose measurements. Transmission factors were determined for three absorbers of different area densities for chamber electrode distance of 5 mm. The variation of the directional dose equivalent at 0.07 mm depth in tissue,  $H'(0.07, \alpha)$ , was determined for beam incidence angles  $\alpha$  from 0 to 60°. The results are comparable to the values found in published literature and in the calibration certificates of standard beta radiation fields. The results indicated the metrological reliability of the extrapolation chamber, which can be used for dosimetry of standard and non-standard beta radiation fields.

**Keywords:** extrapolation chamber, transmission factor,  $H'(0.07, \alpha)$  variation, beta radiation fields