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RESPONSE CHARACTERISTICS OF AN EXTRAPOLATION CHAMBER MADE AT IPEN TO X RADIATION

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Measurements of absorbed dose rates produced by beta or low energy X radiation are often difficult to obtain with accuracy. The recommended instruments for these measurements are extrapolation chambers. A plane parallel ionization chamber of variable air volume of this type was designed and constructed; its performance was tested in the radiation standard beams of the Calibration Laboratory of São Paulo. The chamber has a collecting electrode and a guard-ring of graphite. Teflon was used as insulating material between the electrode and the guard-ring. The entrance window is made of aluminized Mylar (0.84 mg/cm² of superficial density). The performance of the chamber was studied in relation to its response linearity and energy dependence. Extrapolation curves were initially obtained for X-rays (25 and 50 kV), varying the interelectrode distance between 0.2 and

1.0 mm and keeping the electric field constant at 10 V/mm. The calibration factors were obtained. The chamber response linearity was verified by varying the X-rays tube current between 2 and 30 mA, for 25 and 50 kV. Measurements were also taken for 25, 30, 40, 45 and 50 kV, keeping the interelectrode distance and the electric field constant at 1.00 mm and 10 V/mm. An energy dependence of 5.2% was observed between 25 and 50 kV. The obtained results are comparable to those of commercial plane parallel chambers.

Work partially supported by CNPq - Conselho Nacional de Desenvolvimento Científico e Tecnológico, Brazil

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