

New Ionization Chambers for Beta and X-Radiation

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Two new ionization chambers were projected, constructed and tested in beta and X-radiation fields. They have circular form, parallel plates, sensitive volumes of 0.6 cm^3 and collector electrodes of graphite and aluminium. The short and long term stability checks, the angular dependence studies and the lack of current leakages showed that the chambers present performances comparable to commercial secondary standards. The energy dependence of the graphited electrode collector chamber presented a maximum difference in the X-radiation intermediate energy region of only 1.4% in relation to the secondary standard instrument. The energy dependence of the chamber over all this region was lower than 8.8%. In the case of the aluminized electrode collector chamber, the observed energy dependence was, as desired, high (about 50%). This fact permits the energy determination of unknown X-radiation fields, using both chambers, constituting an improvement of the quality control in Radiotherapy level radiation field dosimetry. For beta radiation of $^{90}\text{Sr} + ^{90}\text{Y}$, the performance of both chambers was similar and comparable to secondary standards.