

***Verification for the Disagreement
between Effective Point and Geometrical Center of Thimble Ionization Chamber***

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Abstract

Radiotherapy which attacks cancer in body has been performed as curing and pain relief. In order to deliver correct dose, the measurement of absorbed dose and the dose distribution in body is required, which is one of the most important problems in this field. However, the measurement of absorbed dose in body is very difficult. Therefore, it is considered that the absorbed dose of the tissue is the same as that of water internationally. The absolute dose is measured using a ionization chamber.

To obtain the dose distribution, the absorbed dose at any point is generally required, and the thimble ionization chamber shown in figure 1 is usually used. However, the effective measurement point of the thimble ionization chamber must be specified because the chamber has a finite ionization volume. At present, that point has been defined by radius of the ionization volume. The measurement point called the effective point is placed at the location which is shifted by the distance of 0.6 times of the radius from the geometrical center of the chamber as shown in figure 2. In this work, in order to verify this definition, we investigated and simulated the location of effective point using Monte Carlo Simulation; EGS4.

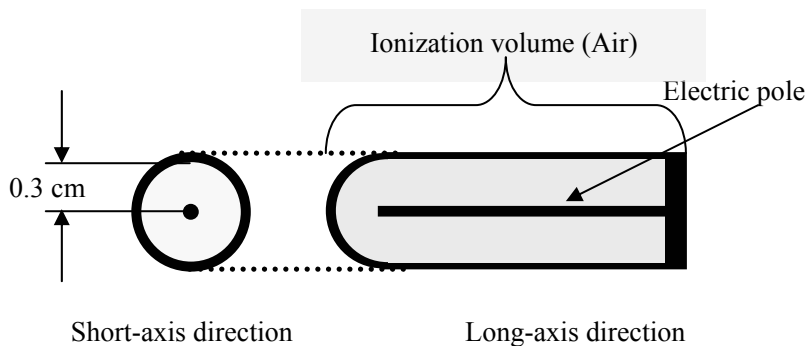


Fig.1 Geometry of thimble ionization chamber

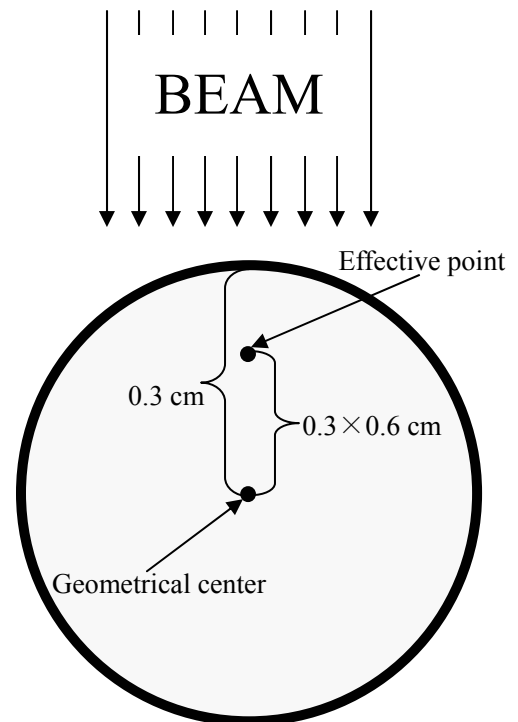


Fig.2 Geometrical center and effective point