

## **Böhm extrapolation chamber: study of its behavior in beta radiation fields at the Calibration Laboratory of IPEN**

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The absorbed dose rate in tissue is the quantity associated to beta particles, and more specifically, it is determined at the depth of 0.07 mm in water, which is the geometry recommended by international recommendations. The primary standard instrument established for this purpose is the extrapolation chamber which allows the absorbed dose rate determination at different depths in tissue, due to the possibility of variation in its sensible volume. At the Calibration Laboratory (LCI) at the Instituto de Pesquisas Energéticas e Nucleares (IPEN) a Böhm extrapolation chamber PTW, model 23392, is being established as a primary standard system for the dosimetry and calibration of beta radiation sources and detectors. This commercial chamber has already been tested in beta radiation fields of  $^{90}\text{Sr}+^{90}\text{Y}$  sources of two beta secondary standard systems of LCI: BSS1, Buchler GmbH & Co, Germany, and BSS2, Isotrak, Germany, with a Mylar entrance window. This entrance window was previously used, because the original one was not available; the extrapolation chamber presented good performance and a great possibility to be used as a primary standard system. An electrometer Keithley, model 6517B, was utilized for the measurements. The objective of this work was to perform definitive characterization tests (null depth, stability of response, leakage current, saturation of response, polarity effect, extrapolation curves and variation of response in function of source-detector distance) of the chamber with an original entrance window (acquired from the manufacturer) of Hostaphan (superficial density of  $0.72 \text{ mg/cm}^2$ ), in beta radiation fields, to be used as a primary standard system at LCI.