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**PRELIMINARY CALIBRATION TESTS OF INSTRUMENTS USED
AT DIAGNOSTIC RADIOLOGY LEVEL**

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Introduction Due to the number of diagnostic X-ray equipments operating in Brazil and to the fact that medical exposure to radiation is by far the major source of exposure to ionizing radiation of the population, the development of a control method for these equipments is being very important, including dose reduction techniques. The objectives of this work are the establishment of diagnostic radiology qualities for instruments' calibration and to test some Radcal radiation detectors.

Materials and Methods A diagnostic radiology X-ray generating system Medicor (model Neo-Diagnomax) was used. In order to establish the diagnostic qualities a PTW ionization chamber (Physikalisch-Technische Werkstätten type 77334) was employed. Exposure rates measurements in front and behind of aluminum phantoms were taken. The beam spectrometry was performed using an Intertechnique spectrometer with a HPGe Eurisys Mesures detector. Seven Radcal ionization chambers were tested (two model 10x5-6, two model 10x5-60, two model 10x5-180 and one model 10x5-1800).

Results The maximum tube voltages (56, 60, 71, 80 and 90 kVp) were obtained using the HPGe spectrometer. The radiation qualities according to the German norm DIN 6872, from 60 to 90 kV, were established. The uncertainty of the PTW ionization chamber calibration factor is $\pm 5\%$. The tested Radcal ionization chambers showed good behavior in the studied range (energy dependence less than 9%), except the 1800 cm³ volume ionization chamber (model 10x5-1800) which showed 17% of energy dependence.

Conclusion This work is part of the improvement program at the IPEN calibration service in order to complete the range of instrument tests. It shows the importance of studies at diagnostic radiology level, and it is being extended for other kinds of instruments normally used in these measurements.

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CALIBRATION OF PLANE PARALLEL IONIZATION CHAMBERS USING THE NEW IAEA
CODE OF PRACTICE, IN A SECONDARY STANDARD DOSIMETRY LABORATORY

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This paper presents the results of calibration of PTW Markus and NACP chambers following the procedures outlined in the new IAEA code of practice. According to this protocol, calibration of plane parallel chambers can be carried out with two methods. The first method uses a high-energy electron beam and consists of comparing the plane parallel chamber with cylindrical chamber whose $N_{D,air}$ calibration factor, traceable to ⁶⁰Co, is known, while the second method applies in a ⁶⁰Co gamma beam whose air kerma rate is known at the calibration point.

As the second method is generally applied in Secondary Standard Dosimetry Laboratories, the consistency of calibrations using this method with the one obtained in electron beams has been estimated with different cylindrical chambers as the reference using two electron beams (21 MeV from CLINAC 1800 and SATURNE II CGR) and applying the factors given by the protocol.

A close agreement is shown between the two methods. However, the ⁶⁰Co calibration method is much less complex than the electron beam method. This work allowed the Algerian SSDL to offer a new service for calibration of plane parallel chambers.