

Metrology of Ionizing Radiation and Radioactivity Measurements

Carlos Oliveira

The group is structured in two sub-groups: one is the Metrology Laboratory of Ionising Radiation (LMRI) and the other the Gamma Spectrometry Laboratory (GSL). The LMRI develops work in the following activity areas:

- Research and training in metrology of ionising radiations.
- Maintenance of the ionising radiation national standards, under a protocol with the Portuguese Institute for Quality (IPQ).
- International cooperation with EUROMET, IAEA, WHO and EA, in the field of interlaboratory comparison of standards and measurements.
- Collaboration and support of other research groups performing measurements or irradiations.
- Services of metrological control – type testing and calibrations – of measuring instruments, according to national regulation (Portaria 423/98).

A Quality System (QS) according to ISO 17025 has been implemented at LMRI. Its management is laborious and is a daily work, involving all staff and was culminated with the Internal Audit in November. The implementation of the QS according to ISO 17025 is a requirement of the Mutual Recognition Agreement (MRA), an international process leading to the mutual recognition of national measurements standards and of calibration and measurement certificates issued by the national metrology laboratories and is being implemented among the Metre Convention Member States.

Simulation tools for radiation transport and interaction with matter by Monte Carlo method has been applied in LMRI and now this methodology is currently used to the research topics.

Intercomparisons of doses at radiotherapy level were performed in programmes run by IAEA/WHO.

The GSL is a metrological facility that supports the research of other groups, by providing data on the radioactivity content of environmental samples.

During 2004, the GSL went through qualitative changes. Our main concern is to provide quality results; to accomplish this, we started to implement quality procedures in our calibrations and measurements. We also began controlling the measurements process by: (i) keeping proper records of our quality assessment measurements; (ii) organizing our sample measurement logbook; (iii) doing periodical checking of our system's stability and performance. Some equipment was acquired: a new HpGe detector and specific calibration sources, as well as some electronic equipment (multiports, oscilloscope, pulse generator).

Measuring environmental samples for research projects and for the national environmental monitoring program is our mainly routine task. We also collaborated with the group of Radiological Protection and Radioactive Waste Management, in the monitoring programme of liquid sewages. Services were also provided to external entities, by analyzing food samples and building materials.

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Research Team

Researchers

- A. FERRO DE CARVALHO, Principal Researcher
- CARLOS OLIVEIRA, Principal Researcher

Technical Personnel

- J.V.S. CARDOSO, Graduate
- L.M. SANTOS, Technical
- V. DAMAS, Tech. (left Nov. 2004)
- L. RAMOS, ITN grant (50%)

Students

- L. SILVA, ITN grant
- J. GOUVEIA, ITN grant (left in July 2004)
- G. CARVALHAL, ITN grant (since Nov. 2004)

Funding (€)

Research Projects:	0
Services:	11.382,00
Total:	11.382,00

Publications

Journals:	3
Proceedings:	7
Conf. Communications:	2
Internal Reports:	1
Theses: MSc	1

