

2009 Report of the ICRM Gamma-Ray Spectrometry Working Group

The Gamma-Ray Spectrometry Working Group is devoted to the development of the metrological aspects of gamma-ray spectrometry and its applications. This includes, but is not restricted to: measurement techniques and equipment, determination of photon emission intensities, detector efficiency calibrations, coincidence-summing corrections, uncertainties, correlations, new instrumentation and X-ray spectrometry.

1. Completed action

Comparison of Monte Carlo codes for efficiency calibration

The action to compare the Monte Carlo codes for efficiency calibration was led by Tim Vidmar and involved 18 participating laboratories (28 people involved). The results of the comparison were orally presented at ICRM2007 and the relevant paper "An intercomparison of Monte Carlo codes used in gamma-ray spectrometry" is published in Applied Radiation and Isotopes (T. Vidmar et al., ARI 66, 2008, 764-768). Two related papers derived from this action were also published (O. Sima and D. Arnold, ARI 67(5), 701-705; K.L. Karfopoulos and M.J. Anagnostakis ICRM-21010 to be published in ARI).

No further developments are presently planned and this action is now completed.

2. On-going actions

Coincidence summing corrections

The main study recently undertaken by the ICRM GSWG focused on the coincidence summing corrections. Different methods (numerical computation, Monte Carlo simulation, empirical methods...) are used to compute these corrective factors and could be compared through this action. The goal of this exercise was to calculate the corrective factors for ^{152}Eu and ^{134}Cs , for several energies and 3 source-to-detector distances (10, 5 and 2cm). Eighteen laboratories are participating in this action and provided about 26 series of results, using 12 different methods. Selected results were orally presented at ICRM2009 and the relevant paper "Intercomparison of methods for coincidence summing corrections in gamma-ray spectrometry" by M.-C. Lépy and all the participants of the intercomparison is being published in Applied Radiation and Isotopes.

An exhaustive report including all the results will be published at the end of the action.

Working Group meetings

2-days workshop

The meeting of the ICRM Gamma Spectrometry Working Group was held in Paris, in the building of the Laboratoire National d'Essais, on February 23-24, 2009. Twenty participants attended this workshop that was mainly dedicated to the coincidence summing action, but gave also the opportunity to discuss different topics such as : efficiency calibration, uncertainties, detection limits, etc.

Business meeting

The Gamma Spectrometry Working Group business meeting was held during ICRM2009, on September 9th, 2009. About 50 participants attended the meeting and the agenda included the WG activity report, some short presentations, information and discussions.

GS WG Web site

The web page dedicated to the Gamma Spectrometry WG is hosted by LNHB at the address: http://www.nucleide.org/ICRM_GSWG.htm with a link on the ICRM main site hosted by NIST: (http://physics.nist.gov/Divisions/Div846/ICRM/working_groups.html#GSWG).

Information concerning the working group actions is available there.

GS WG forum

The GSWG forum (address: http://laraweb.free.fr/GRS_forum/) has been created to facilitate exchanges among the working group members. On January 2010, the forum had 72 registered members, unfortunately there are too few exchanges between them and suggestions for improving the attendance are welcome.

3. Further projects

Next step of the coincidence summing corrections

The next step of the coincidence summing action will be dedicated to coincidence summing corrections for volume samples. Experimental data will be obtained with ^{152}Eu and ^{134}Cs solutions measured close to the detector window and will be provided to the participants on spring 2010.

Detection limit- Decision threshold

It was proposed to have a “sub-working group” dedicated to this specific aspect. The output would be a short document (basic guide) with practical recommendations and simple application examples. Some discussion were held during the ICRM2009 business meeting and it was pointed out that the update of the ISO11929 standard should be taken into account.

Workshop

A workshop of the ICRM Gamma Spectrometry Working Group is planned in winter 2010 to report about the on-going actions and to give the WG members the opportunity to meet and to work on selected topics.

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