



Contribution ID: 269

Type: **Contributor (Panel Session)**

International database of gamma-ray spectra for U and Pu isotopic analysis

An international database of gamma ray-spectra acquired on uranium, plutonium and mixed oxides (MOX) materials has been developed under the auspices of the International Working Group on Gamma Spectrometry Techniques (IWG-GST) as an online repository to test and validate codes developed for U and Pu isotopics determination from gamma-ray spectrometry. Such database of reference spectra will be useful for both code developers to benchmark their newly developed code or version and thus improve software quality assurance, and end-users such as Safeguards organizations, operators of the nuclear fuel cycle and R&D institutions, to compare different codes for their own needs and thus understand their capabilities and limitations. The database of uranium, plutonium and MOX reference spectra has been structured according to three main sections : good quality spectra, lower quality spectra and unusual spectra. In a first step, the spectra collected from IWG-GWT members together with information on sample composition (reference values) and measurement configuration were gathered according to the detector type, electronics settings and nuclear material category (U enrichment, Pu burnup, Pu/U mass ratio). Criteria were then defined to populate the three main sections. An automated interface AutoISOPLUM was notably developed by IRSN to extract the parameters of interest of each collected spectrum and compare them to the agreed upon good quality acceptance criteria and help in spectrum categorization. The online repository is hosted by the European Safeguards Research and Development Association, and accessible on registration through a common username/password. The paper describes the purpose and background of the International database, its structure, content and access modalities.

Which "Key Question" does your Abstract address?

SGI1.2

Which alternative "Key Question" does your Abstract address? (if any)

SGI1.4

Topics

SGI4

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Session Classification: [TEC] Improving Coordination of Safeguards R&D

Track Classification: Leveraging technological advancements for safeguards applications (TEC)