



FORTRAN
C/C++



MULTI-
PLATFORM



PC
or UNIX

SCR# 2145

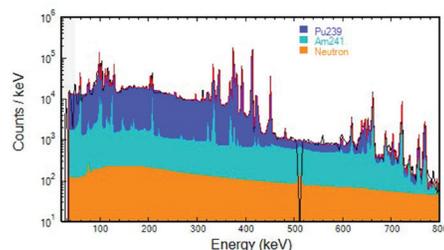
Software for the identification of radionuclides within gamma-ray spectra in real-time or post-processing

Identifying gamma-ray emitting radionuclides remains a critical step in characterizing and assessing the level of threat posed by known or detected gamma-ray radiation. Full Spectrum Analysis Isotope Identification (FSA Isotope ID) is a gamma-ray spectrum analysis software application that identifies radionuclides and radioactive isotopes. It is suitable for use in real-time collection systems, such as handheld or vehicle-mounted radioactive isotope identifiers (RIDs) used by emergency first responders, law enforcement, and hazardous materials specialists, as well as in the post-processing of recorded data files.

The FSA Isotope ID algorithm applies an iterative process to fit spectra using combinations of pre-computed templates. The isotope identification algorithm is suitable for the analysis of spectra collected by gamma-ray sensors ranging from medium-resolution detectors, such as NaI, to high-resolution detectors, such as HPGe. The search subroutine maintains a running background spectrum that is passed to the isotope identification algorithm, and it also selects temporal integration periods that optimize the responsiveness and sensitivity. Gain stabilization is supported for both types of applications. Multiple templates for a given radionuclide may be combined to synthesize spectral shapes for shielding configurations that are not represented explicitly in the template database. Linear regression is used to rank templates for consistency with measured spectra. FSA Isotope ID includes an application programming interface (API) containing both static and search methods.

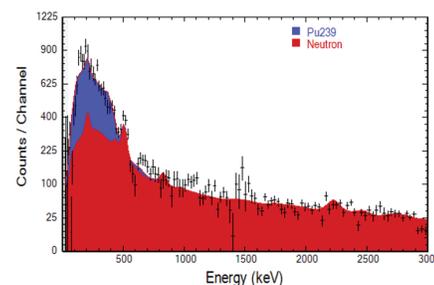
TECHNICAL BENEFITS

- High sensitivity and responsiveness
- Compatible with diverse detector types, including medium to high-resolution
- Can be used in small portable devices or as an app for real-time calculations
- API contains both static and search analysis methods
- Gain stabilization supported for both application types



Natural + SNM

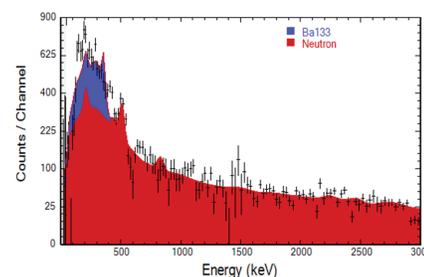
live-time(s) = 213.29
chi-square = 2.48



WGPu Solution

Natural + Industrial

live-time(s) = 213.29
chi-square = 3.09



Ba133 Solution

Examples of FSA Isotope ID's application programming method (API). Top: High resolution detection. Middle/Bottom: Low to medium resolution detection.