HIROCS

by SYSCADE

RADIOACTIVE OBJECT CHARACTERIZATION

HIGH RESOLUTION OBJECT COUNTING SYSTEM FOR IDENTIFICATION AND LOCALIZATION OF RADIOACTIVE SOURCES

HIROCS™ is an industrial grade detector system based on latest CZT semiconductor technology offering portable and efficient gamma spectrometry.

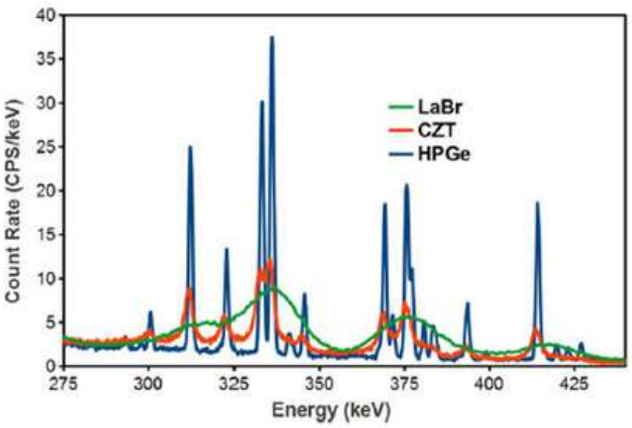
The system combines high resolution spectrometry and Compton imaging for identification and localization of radioactive sources. HIROCS represents a versatile and deployable advanced solution for environmental radiation surveys, waste drums, pipes and other components assays, and nuclear safeguards applications.

The complete assembly includes:

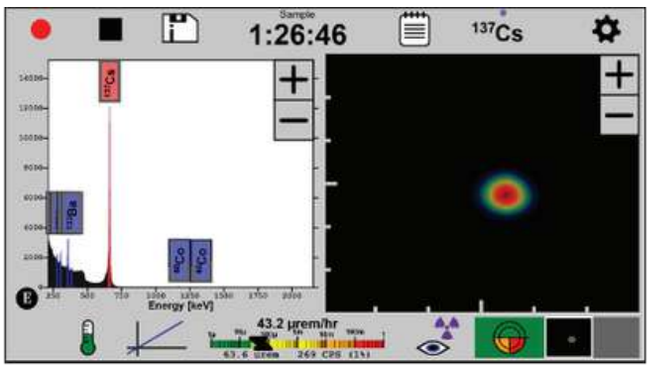
- Compact and robust CZT spectrometer (H3D) with < 1% FWHM at 662 keV
- Several CZT crystal volume options (M100: > 4,5 cm^3 - M200: > 9 cm^3 - M400: > 19 cm^3)
- Lead shield with inner copper lining
- Set of collimators (optional) for optimal field of view (120°, 90° & 60° or custom made)
- Tripod stand with supporting base
- Tablet with Web-Based GUI for real-time radionuclide monitoring and data acquisition
- Wired/Wireless connection
- Automatic acquisition and data collection using Web-API protocols
- Post-processing software for multiple spectrum data analysis
- Compton imaging technology (optional) to visualize radiation hotspots
- Activity evaluation using Source Term with predefined objects or custom geometries

FEATURES

- High mass-to-volume efficiency, compact size and lightweight
- Optimized shield to reduce background noise and achieve low-level MDA in-situ measurements

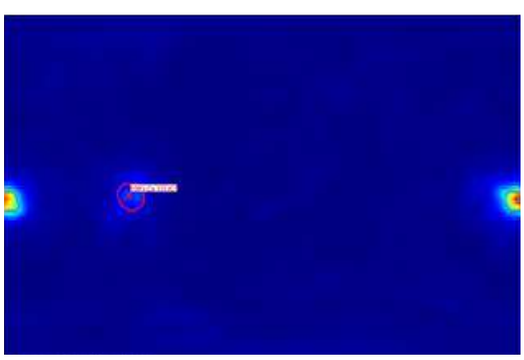


Excellent resolution (close to HPGe) in comparison to other detectors available on the market.

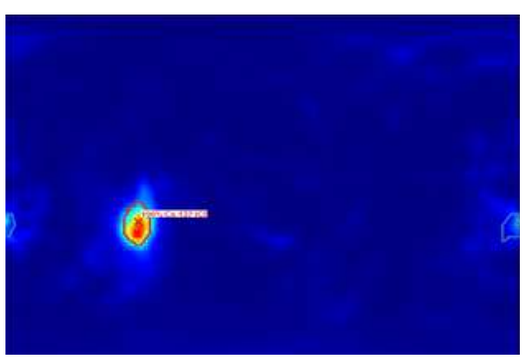


Real-time spectrometry and isotopes identification: Online radionuclide monitoring and hotspots detection via Compton Imaging.

- Reduced interference of nearby sources: clear identification of low-activity source despite the presence of nearby high-activity sources. Collimators available to focus on objects to be analyzed.



Typical detector response without shield nor collimation.

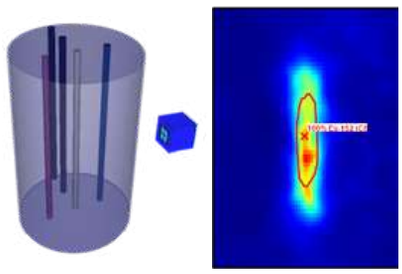


Hirocs response.

APPLICATIONS

- **Environmental Radiation Surveys**: Quick in-situ assessment of radiation in natural, industrial, and reactor environments. HIROCS™ enables real-time radionuclide identification and hotspots visualization without sample collection or laboratory analysis.
- **Waste Drums, Pipes & Components Assay**: Accurate localization and activity estimation of radionuclides in waste drums, pipes, and other components. Object-based source modelling combined with collimation allows reliable waste characterization.
- **Decommissioning & Decontamination Measurements**: Detection and discrimination of low-level contamination in complex geometries during facility decommissioning. Optimized shielding and high energy resolution enable to achieve low-level MDA measurements.
- **Nuclear Safeguards & Regulatory Inspections:** Portable solution for verification measurements, source localization, and isotopic identification during safeguards inspections. Real-time Compton imaging enhances situational awareness in high-background environments.

SPECTROMETRY & COMPTON IMAGING	
Technology	Radionuclide Identification & Localization, Object Counting System
Crystal	CdZnTe semiconductor (2.2 x 2.2 x 1 cm) 1, 2 or 4 crystals versions available (M100, M200, M400)
Spectrometry Range	50 keV to 3 MeV
Imaging Range	250 keV to 3 MeV
Energy Resolution	<1% FWHM at 662 keV
Bin Width	1 keV
Detection Time	10 µCi Cs-137 at 1 m (~0.03 µSv/hr) < 22s (in natural background)
Angular Precision	±1° source localization
Dose-Rate Limit	10 mSv/h for Cs-137
Maximum Event Rate	150 kcps
Ambient temperature	-20 to 50°C (fan enabled)
PHYSICAL FEATURES	
Dimensions	L 17.0 x W 13.5 x H 20.5 cm (CZT detector: L 10.2 x W 5.7 x H 5.7 cm)
Weight	8 kg (CZT detector: 600 g)
Tripod height	65 to 180 cm
Enclosure	Aluminium Housing IP67
Shielding	Lead + Copper lining
SYSTEM INTERFACE	
Power Supply	5V, through USB-C port
Connections	USB-C, Wi-Fi module
Com. Protocol	Web-Based API
Data Storage	Inbuilt - 64 GB
Data File Format	According to ANSI N42



Waste drum with linear radiation source: identification, localization and quantification by HIROCS.

Remote control acquisitions using Real-Time Software on the tablet.

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