Klasteru attīstības programmas projekta "Latvijas Elektronikas un elektrotehnikas nozares klastera attīstības projekts" ietvaros (LR Ekonomikas ministrijas līdzfinansējuma līgums Nr. Līg.– 2011/08)









Semiconductor detectors & Nuclear Electronics for Radiation Measurements







History





Baltic Scientific Instruments was established in 1994 on the basis of Riga Research and Development Institute for Radio-Isotope Apparatus (RNIIRP, est.1966), which belonged to Ministry for Atomic Energy.

In 2003 the company has entered the group of BRUKER companies and in 2007 has change the name to Bruker Baltic. In June, 2010 the company has bought out its shares from Bruker AXS and returned its name Baltic Scientific Instruments (BSI).





OUR PARTNERS

Agency International Atomic Energy (IAEA) **Nuclear Power Plants** (Russia, Ukrain, France, India, China, South Korea) **Environmental & Food Control Organizations** Industrial OEM direct Customers, both and **Numerous Universities & Research Institutes** Space Research Institutes (ESA, NASA, SEA Saclay,

Danish SRI, Italian SRI, Russian SRI, China SRI)



Coaxial and Planar High-Purity Germanium (HPGe) Detectors and Electronics



Gamma and X-ray HPGe Detectors Cooled by LN₂



- Customized Dewar vessels
- Excellent energy resolution
- Data acquisition software

Possible detectors: Coaxial

• Efficiency 10...160%

Planar

Sensitive area – 20 …2000 mm²

Portable Gamma and X-ray HPGe detectors



Portable Dewar vessels for
24, 48 and 96 hours of operation

DEFINISTRUMENTS

- Available with HPGe coaxial or planar detector
- Transportation and storage without cooling
- Any spatial orientation

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Gamma and X-ray HPGe Detectors with "electric cooling"



- No liquid nitrogen
- Similar energy resolution as LN₂ cooled detectors
- Any spatial orientation
- Long duration continuous operation





Laboratory HPGe Spectrometer with shield for Radionuclide Analysis



- Radionuclide monitoring of environmental and biological objects, materials and food
- Detection limit for ¹³⁷Cs 0.5 Bq/kg
- Low level of instrumental background





Hand Held Detector for Field Application – the Most Light Hand Held Detector in the World



- Cooling time is 1 hour only
- Holding time is 20 hours
- Weight is 2.4 kg only





Full Spectrometer complete set in case



Applications HPGe



Automated Spectrometer for Radionuclide Analysis of Liquid and Gaseous Flows

Applications HPGe





Structure of the system :

- $1 HPGe \gamma$ -radiation detector
- 2 measurement unit
- 3 lead shield
- 4 valves unit
- 5 electronic unit



Applications HPGe



HP(Ge) Mobile Spectrometer for Field Application

Features:

Optimal sizes and weight for mobile application

Placed on a trolley with Lead shield set

Minimal time to reach the operating temperature after LN2 filling

Simplicity of operating and servicing the device

Waste Assay Monitor





Multi Channel Analyzer DigiSpectrum with analytical software





Multi Channel Analyzer Hybrid with analytical software







SpectraLineGP software package



Portable identifier of radionuclides







Si(Li) Detectors and Electronics



Si(Li) Detectors Cooled by LN₂



- Sensitive area 10 …500 mm² customized geometries available
- Excellent energy resolution
- Any spatial orientation
- Thin Be or polymer windows
- Customized Dewar vessels
- Data acquisition software



Fe-55 spectrum of SiLi detector (20 mm²)





Si(Li) Peltier Cooled Detectors



- Sensitive area 10 ...100 mm2 customized geometries available
- Resolution 160eV @ 5.9keV
- Closed system
 - no liquid nitrogen
 - no external cooling water
- Any spatial orientation
- Thin Be or polymer windows
- Data acquisition software



Fe-55 spectrum of SiLi Peltier cooled detector (20 mm²)





Application for Si(Li) Detectors: X-ray Diffraction





CdZnTe Detectors



CZT Large Volume Detector CZT/500(S) and Spectrometric Detection Probe SDP310/Z





CZT500(S) with preamplifier

SDP310/Z



CdZnTe Co-planar Grid Detectors





- State of the art performance:
 - volume 15 x15 x10 mm³;
 - energy resolution 1.7 % at 662 keV (¹³⁷Cs)
- Application: Safeguard in nuclear industry



CdZnTe (4x4)-Pixel Detectors





- High spectrometric performance from pixel to pixel
- Imaging in medicine and industry
- Space research applications



Pixel Detectors





16x16 pixel detector based on crystal 15x15x10 mm³

Pixel Detector



Thank you for your attention!

Questions?