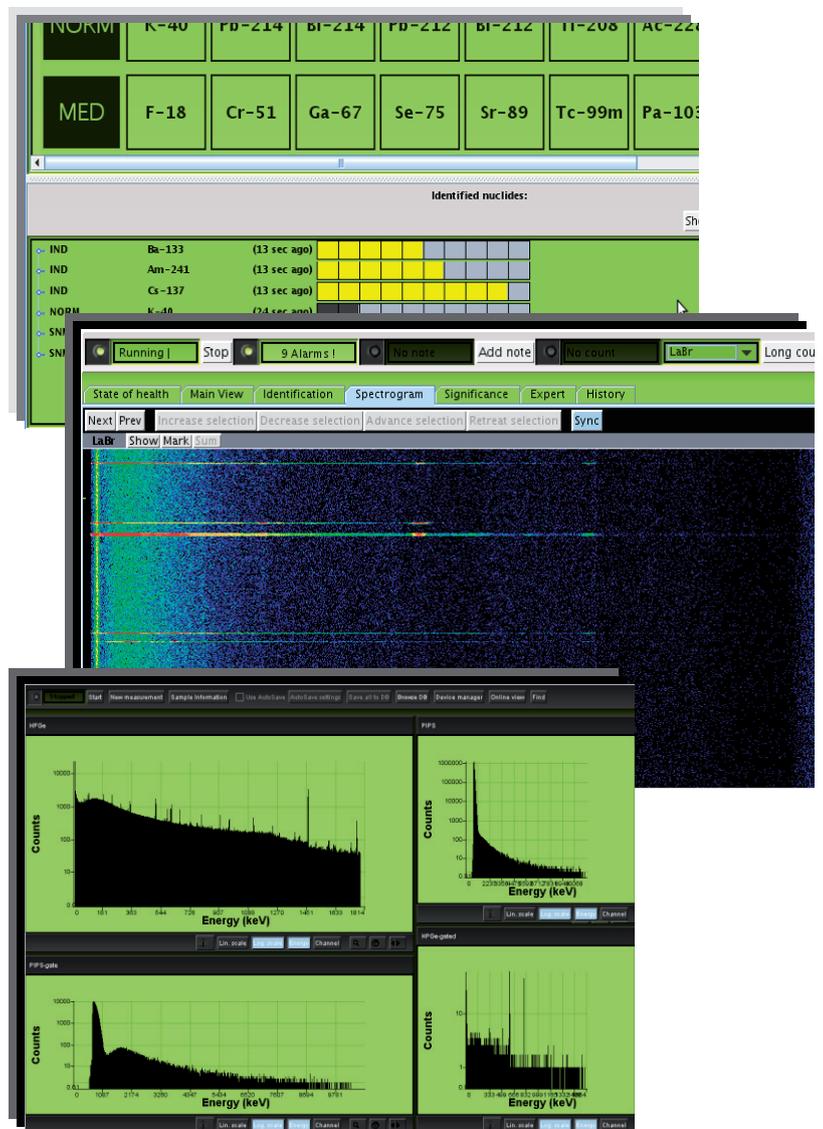


VASIKKA – In-field spectrometry system

VASIKKA is a versatile spectrometry software system for managing acquisition, communication and analysis of data from multiple radiation detectors in real time. The VASIKKA software can be deployed in various different configurations, from portable field units to laboratory applications. VASIKKA is fully compatible with remote reachback services.

Features

- Fully automated operation for non-expert users.
- Fast and robust analysis, including isotope identification.
- Integration with LINSSI database.
- Versatile communication capabilities; transfers data to reachback center in real time.
- Configurable to different needs; customized online data processing.
- Data visualization for detection, analysis and reporting.
- Modular and portable, runs on both Windows and Linux, from server to smartphone.



Applications

RID (Radionuclide Identification Device)

A backpack with gamma and neutron detectors controlled by VASIKKA forms the basis of a RID. In addition to its detection and identification capabilities, the backpack unit transfers data to the reachback center in real time.

Radiation surveillance vehicle

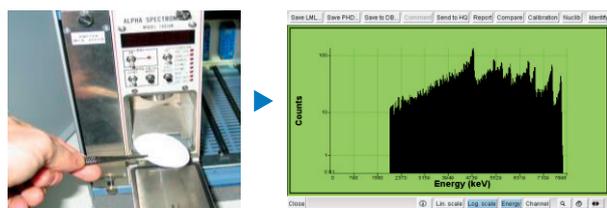
A radiation surveillance vehicle with two large NaI detectors, a LaBr₃ detector, a fixed HPGe, a portable HPGe and alpha spectrometry capability uses VASIKKA to manage data acquisition and analysis (Fig. 2).



Fig. 2. VASIKKA controls the data acquisition, analysis and communication in the surveillance vehicle.

Alpha spectrometry in the field

The communication capabilities of the VASIKKA software allow alpha spectrometric measurements to be carried out in the field (Fig. 4). The spectrum is transferred to reachback center where the most complicated task, the spectrum unfolding, is carried out.



▲ **Fig. 4.** Alpha spectrum measured directly in the field. The analysis of the spectrum requires specialized programs and techniques available in the reachback center.

Portal monitoring

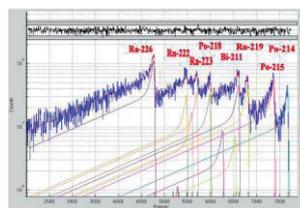
A pillar type portal monitor with a NaI spectrometer uses a small embedded computer running VASIKKA for radiation detection and isotope identification. The stationary nature of the pillar is taken into account in the analysis algorithm.

Data acquisition in laboratory systems

Data acquisition in laboratory systems (Fig. 3) can be controlled by VASIKKA allowing full use of LINSSI database and customized processing and visualizations.



Fig. 3. The MiniPANDA system, based on alpha/beta/gamma coincidence counting, utilizes VASIKKA for data acquisition and storage.



▶ **Fig. 5.** A commercial RID based on the VASIKKA software.

Technology readiness

The VASIKKA software is in commercial use (Fig. 5), with more applications under development.

Further reading

- Karhunen T, Smolander P, Toivonen H. Detection of radiation sources and assessment of measurement signals for nuclear security, Abstracts – Third European IRPA Congress, 14–18 June 2010, Helsinki, Finland. Helsinki: Nordic Society for Radiation Protection; 2010. p. 193.
- Smolander P, Toivonen H, Pelikan A, Karhunen T, Salonen T. Mobile radiation measurement system with remote data handling and analysis. In: Maatela P, Korpela S (Eds.). Symposium Proceedings. NBC 2009. 7th Symposium on CBRNE threats. 8–11 June, 2009, Jyväskylä, Finland. Defence Forces Technical Research Centre, Publications 18. Helsinki: Defence Forces Technical Research Centre; 2009. p. 135–138.

