

Semiconductor Detectors as Radiation Monitors

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The Real Time Wide Area Radiation Surveillance System (REWARD) is a novel mobile system for radiation detection and monitoring based on the integration of two new miniaturized solid-state radiation sensors. One sensor is a Cadmium-Zinc-Telluride ((Cd,Zn)Te or CZT) detector for gamma radiation with precise energy measurement to identify the emitting isotope. The CZT detector unit is made in Freiburg. The other sensor is a highly efficient neutron detector based on 3D silicon detector technologies made by CNM Barcelona and a converter material.

These detectors form the core of a sensing unit (the tag) which also includes a wireless communication interface to send the data remotely to a monitoring base station as well as a GPS unit. REWARD will be operated as a network of individual mobile units mounted e.g. on vehicles. The system is modular in the sense that virtually any number of sensing modules in a network is feasible, allowing the flexible adaption of the scale of the system to the end user needs.

The use cases of REWARD are a number of scenarios ranging from nuclear terrorism threats and lost radioactive sources to nuclear accidents.

REWARD tags are small, mobile portable units. They can be installed in patrol vehicles, emergency units and in general in any type of mobile equipment. Stationary installations inside buildings or infrastructure are also feasible.

This presentation will introduce the REWARD project, funded within the 7th Framework Program of the EU. Particular emphasis will be placed on the novel radiation detectors of REWARD, and the performance of these detectors in realistic deployment scenarios.

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