

The VIDEO project

The aim of the VIDEO project is the development of a device enabling the detection and location of gamma radiation from hidden sources. The intended application of the device is finding dirty bombs, preventing terrorist attacks with radioactive material. Thus ultimate detection sensitivity and capability of tracking moving gamma sources is required. The project is running since 2011 at GSI in close contact with German security forces. It relies on gamma detection methods developed at GSI for the detection of rare gamma quanta in nuclear reactions investigated in basic research. These methods were adopted to the needs of VIDEO. A hand-held device, VIDEO-2 has been built to demonstrate the basic functionality. The detector unit includes six scintillator detectors (read-out by SiPM arrays) enabling full 2D and limited 3D direction determination of a single source. For optimal performance in terms of isotope identification and rate capability, CeBr₃(Tl) crystals with their good energy resolution and fast signal are chosen. A detection sensitivity of >2500 cts/s at 1 µSv/h and a direction sensitivity of 2 degree has been reached. The detector is scalable to further increase sensitivity, for instance for vehicle based systems for remote sensing of radioactive sources over very large distances. Other applications are possible, notably remote monitoring systems for environmental surveillance and nuclear installation control.

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