



*This project  
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## **Detection of Explosives in Cargo by Neutron Resonance Radiography (NRR)** (ref. 983150)

Building on prior initiatives in their respective countries, German and Israeli scientists are developing a cutting-edge method for security-inspection of cargo by means of high-spatial resolution Fast Neutron Resonance Radiography (FNRR). The method is applicable for both border crossings and aviation security. Unlike X-ray radiography systems, FNRR does not rely on human operator skills to identify the shape of the threat. Instead, it enables automatic identification of the concealed contraband by its elemental composition and can reliably detect standard and improvised explosives in solid or liquid form.

The overall objective of this project is to develop a laboratory scale FNRR demonstration facility for automatic detection of standard and improvised explosives in cargo. Within the scope of the project, the principal objective of this research is to develop a novel, high-spatial-resolution Time-Resolved Integrative Optical fast-Neutron (TRION) detector.

The data of the December 2008 PTB run were transmitted to the end-user Supt. Ilan Havardi Israeli Police, Border Crossing division, Jerusalem, Israel and discussed. With the help of the end-user, a meeting with representatives of a security company Nuctech was organized. The method and the project were presented and we explored possibilities of transferring the technology to the company at a later stage. Contact was also established with representatives of Smiths Detection in 2009 and again in September 2010 where the chances of neutron-based methods in cargo scanning were discussed.

### **Project Co-Directors:**

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