



Contribution ID: 176

Type: Poster

## A 2-D localization of a lightly shielded radiation source using a network of small form factor CZT sensors

*Wednesday 10 July 2019 16:51 (2 minutes)*

Detection of radioactive sources in unconstrained environment with no specific entrance and exit points remains a challenge for nuclear security. The problem is more difficult when it comes to shielded radiation sources. In this work we present an approach of a sensor network that is composed of small form factor CZT radiation sensors which uses both an analytical algorithm and MVA techniques to localize a light shielded radiation source in 2D. The system is capable to combine the fast response time and the large Field Of View (FOV) of the CZT sensors to target spatially confined radioactive sources. Localizing a  $^{137}\text{Cs}$  ( $\sim 7\text{MBq}$ ) with the CZT network yields to a precision better than 20cm in planar coordinates when covering a FOV of  $500 \times 280 \times 200\text{cm}^3$  for acquiring time greater than 40sec. Both analytical and Machine learning localization algorithms have been simulated and verified by a series of experiments.

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**Session Classification:** Poster Exhibition 2, Posters ID 81 - 182, chair: Christer Frojdh

**Track Classification:** general