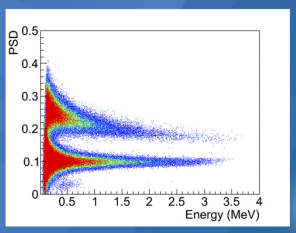
CAEN SyS

Systems & Spectroscopy Division

GAMMA AND FAST NEUTRON DETECTION SYSTEMS BASED ON COMBINED SCINTILLATORS FOR NUCLEAR SAFEGUARDS AND SECURITY APPLICATIONS

Gamma Neutron Counting

High-efficiency gamma/neutron organic detector
Pulse Shape Discrimination algorithm



** same Pulse Shape Discrimination (PSD) implemented in the IAEA Fast Neutron Collar Monitor (fresh fuel verification)

Extensive Test Campaign

NEUTRON SOURCES: PU-239 65-75% ENRICHED

Test results for the source 1 in different measurement conditions

distance (cm)	Shielding	Identification/trials
15 x standard	-	150/150
15 x standard	Poly 5 cm	14/15
15 x standard	Pb 5 cm	14/15
25 x standard	-	30/30

Test results for the source 2 in different measurement conditions

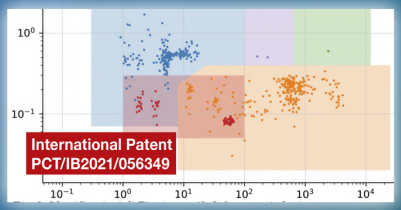
distance (cm)	Shielding	Identification/trials
15 x standard	-	9/9
15 x standard	Poly 5 cm	8/8
15 x standard	Pb 5 cm	6/8
20 x standard	-	8/8
25 x standard	-	12/15

SNIPER G-N Special Nuclear Material &Severe Nuclear Threats Identifier

Remote measurement systems

1. Radiation detectors
2. Electronic for Internal data processing
3. mini-computer for internal data logging
4. Battery powered (battery backup)
5. Wi-Fi connection for data visualization

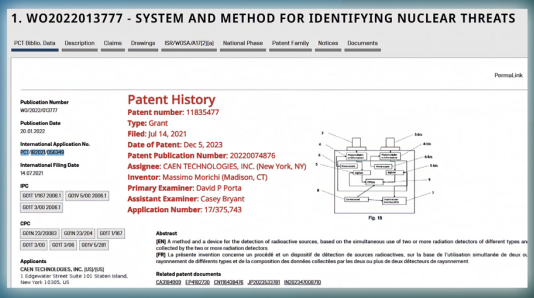
Neutron Source Identification



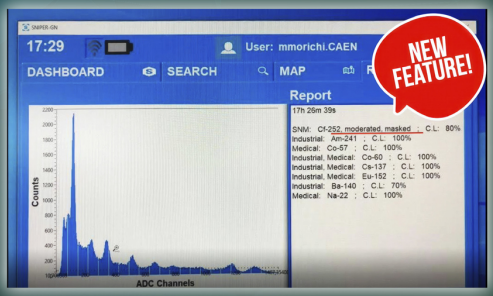
Different conditions:
- Moderated
- Shielded
- Masked

Am/Be (red) area is discriminated through a 3rd parameter

International Patent PCT/IB2021/056349



Exceeding the standards



Portable and Scalable

BACKPACK
- Less than 8 kg
- 38 x 30 x 14 cm
- Battery: 8 hours (hot-swap)
- Wireless connectivity

RACK/MODULAR
- Scalable number of detectors
- Battery backup
- Rack mountable
- Deployment in reconciliation rooms

- Modular design with external detectors
- Large volume detectors for access monitoring

4 channel-Fast Neutron Data Acquisition System