



High-Yield Neutron Technology for Cargo Screening

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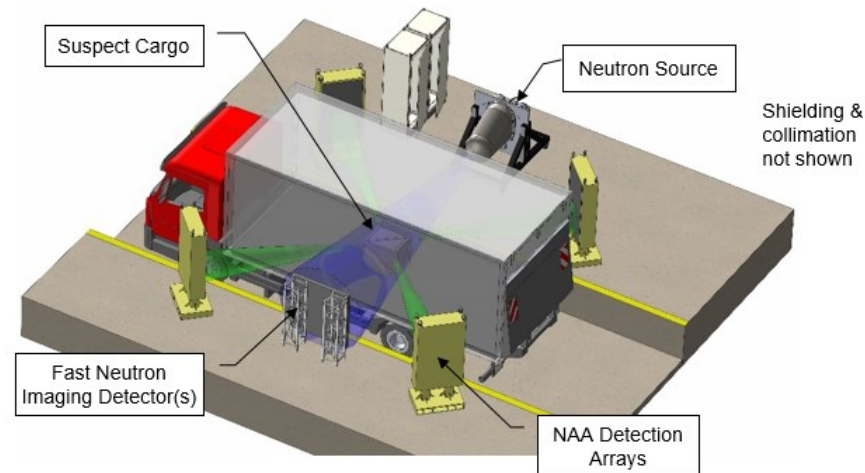
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DHS S&T Contract #:
70RSAT21CB0000007

So What? Who Cares?

HIGH-YIELD NEUTRON TECHNOLOGY FOR CARGO SCREENING

- Problem: Need reliable, non-intrusive, safe, high-throughput screening of cargo at Ports of Entry to manage additional throughput and increase seizure rates
 - Manual inspection after X-ray primary screening is time-consuming, labor-intensive
- Solution: High-yield neutron interrogation at secondary screening
 - 24-month Base program: trade space study and system design (focus on narcotics)
 - Fusion of data from: X-ray Imaging, Fast-Neutron (N-Ray) Imaging, Neutron Activation Analysis
 - Neutrons: Material specificity; high penetration; complementary to X-rays; automatic determination

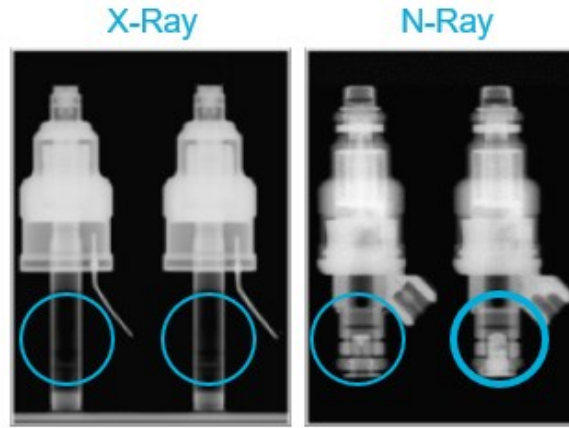


SHINE's High-Yield Neutron Source Technology

PROVEN INDUSTRIAL NEUTRON GENERATORS

- Commercialized for applications previously requiring nuclear reactors or radioisotope sources:

- Industrial neutron radiography
- Medical isotope production
- QA inspection of nuclear fuel
- Radiation effects testing, etc.

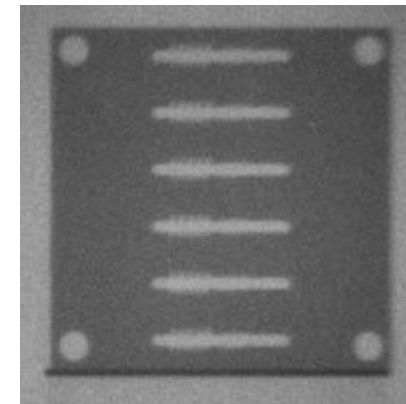
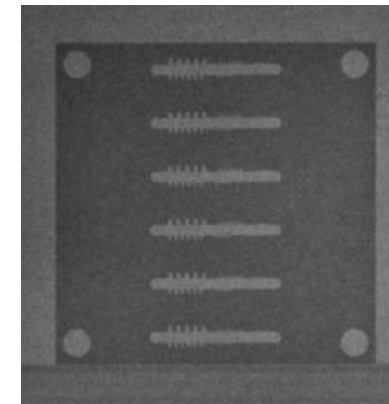
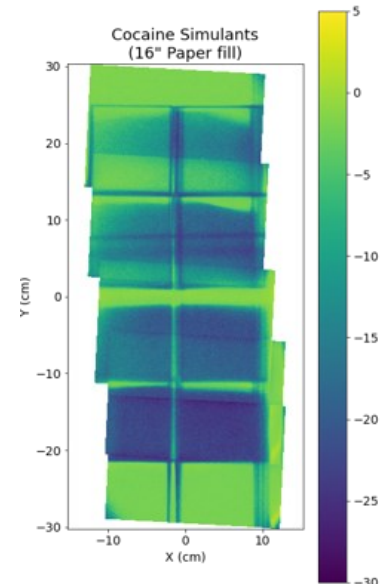


Type	Max Yield, n/s
DD	7×10^{11}
DT	5×10^{13}
Other	3×10^{13}

- Stronger source → Better statistics:

- Shorter decision times
- Superior neutron image quality
- Improved material discrimination

- Can also leverage advancements in machine learning, detection technology, computational power, etc.



Collaboration Opportunities – Government and Industry

HIGH-YIELD NEUTRON TECHNOLOGY FOR CARGO SCREENING

- SHINE is looking for:
 - Direct operator/stakeholder input
 - Performance goals, constraints, viable CONOPS
 - Ports of Entry that could benefit from new technology at secondary
 - Partnership opportunities:
 - Machine learning, data fusion algorithms
 - Novel detection technology
 - Systems integration / commercialization

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