Experiments show that Epithermal Neutron beams can be used for Physically Cryptographic Warhead Verification


**Template Verification**
- Acquire an authentic warhead – “golden copy”
- Golden copy is the basis of all comparisons
- Acquire a candidate warhead
- Perform a comparison
  - No information can leak
  - → use physical encryption (no computers)
- Verify that the two objects are identical
  - → use an isotope-sensitive process, nuclear resonances
- → candidate becomes authentic.

Analogy with underdefined system of equations:

\[ X + Y = 10 \]

encrypting filter

\[ X' + Y = 10 \]

candidate weapon

Conclusion:

\[ X' - X = 0, \quad \Rightarrow \quad X' = X \]

Information Security: X can be anything between 0 to 10.

The technique is very sensitive to differences between two objects, enabling verification. It is Insensitive to the object mass/geometry/enrichment, protecting secrets.

**CONCLUSIONS**

We CANNOT infer the object content.
We CAN verify that the object is identical to the “golden copy.”

→ The object must be authentic
→ No secrets revealed