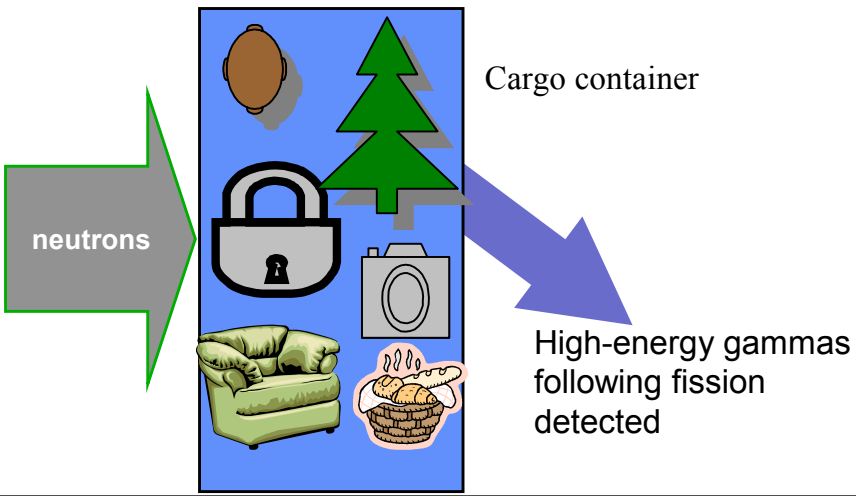
Homeland Security Research & Development

FY 2003

Active Interrogation: Signatures of Fissile Materials: High-Energy γ Rays Following Fission



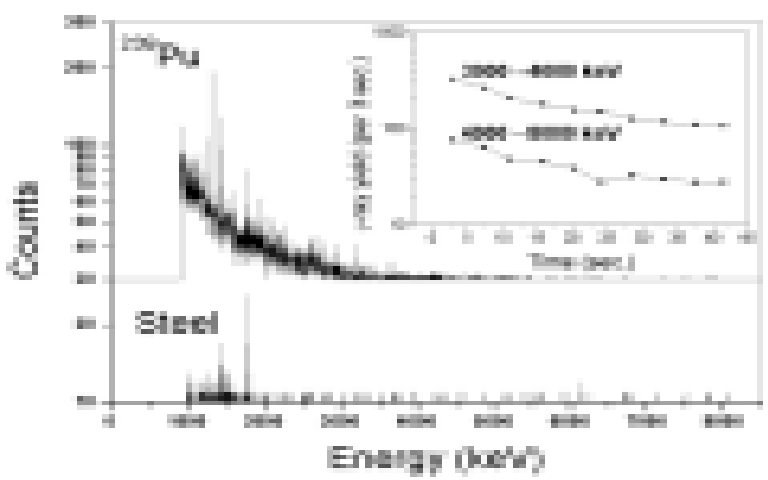
Description

Use neutrons (or high-energy photons) to actively interrogate cargo containers for SNM

Detect high-energy gammas (> 3 MeV) from beta decays of fission fragments. Gamma ray yield is 10 times greater than than of beta-delayed neutrons and gammas escape from hydrogenous cargo much easier than neutrons.

Team: LBNL, UC Berkeley, LLNL

Initial Results



Status

Initial tests on ^{235}U and ^{239}Pu at LBNL showed unique signature of fissile material: (a) nearly continuous spectrum up to 6 MeV, (b) effective half life of approximately 25 seconds.

First results accepted for publication in Nuclear Instruments and Methods A (2003)

<u>Future plans</u>

Test Gd-loaded liquid scintillator as gamma and neutron detector

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