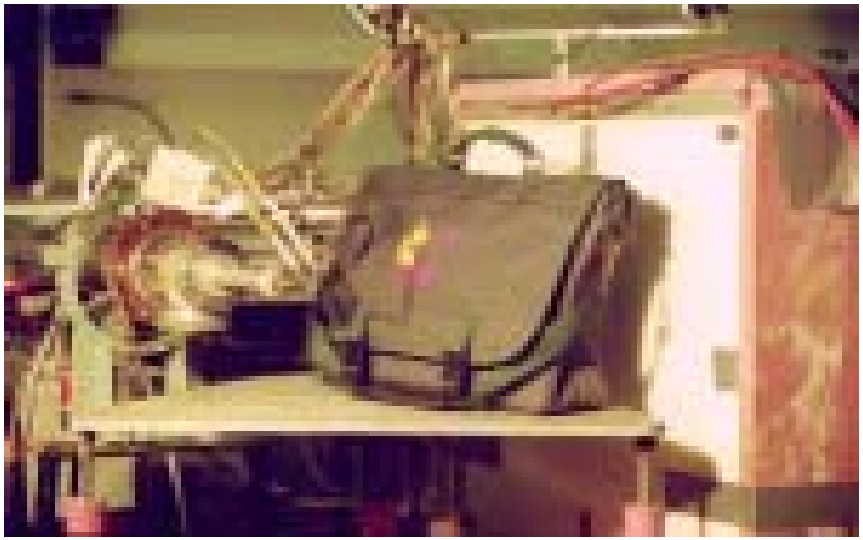
Donald L. Smith (619)435-6724 Donald.L.Smith@anl.gov *Argonne National Laboratory*

FIGARO: Nuclear Materials Detection



Concept FIGARO is a scheme for detecting nuclear materials (U, Pu, Be, D, ^{6}Li) with a low-energy proton accelerator, gamma interrogation, prompt signature neutron detection and simple detectors and electronics

Physics

- 6-7 MeV photons produced by $^{19}F(p,\alpha\gamma)^{16}O$ reaction
- Gamma ray energy is above photo-fission and photo-nuclear thresholds for actinides and other nuclear materials but below threshold for most benign materials

Advantages

- Efficient use of interrogating and signature radiations
- Does not require imposing complex timing conditions
- Potential for very low background and high sensitivity

Potential Applications and Customers

- Inspection of items leaving storage facilities, crossing international borders, at airports, and key checkpoints
- TSA, Customs, DoD, DoE, NNSA

Status

- Physics measurements completed – basic concept was demonstrated successfully at an accelerator laboratory
- All results are reported in published journal articles
- Work has been supported by Argonne LDRD funds – future progress depends on attracting sponsor for project