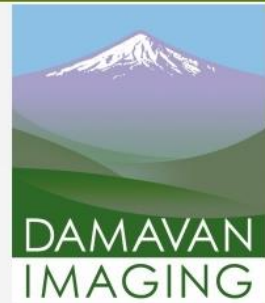


Temporal δ Dream Scanner

See what's inside you waits in 3D



One click 3D mapping of contamination inside 220 l drums (No movement)

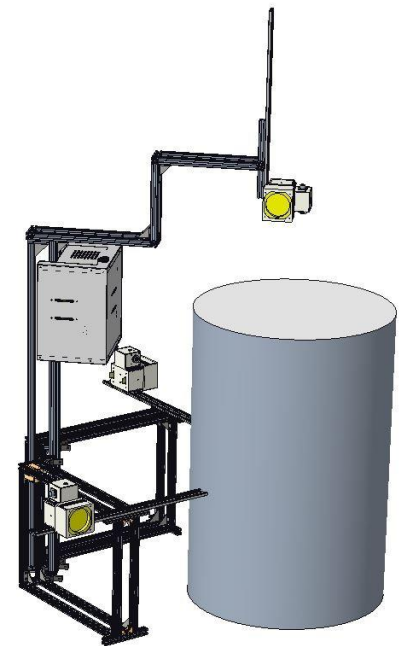
Our Compton camera is a "all in one" instrument

The best Compton **imager** (400 KeV- 3000 KeV), excellent **spectrometer** (50 KeV-3000 KeV) and a stable **photon counter**.

With 3 compton heads, it is possible to obtain in **10 minutes** with in a purely static way (no rotation) the 3D Mapping of contamination inside a 220 litter waste drum containing a few MBq of total activity (gamma emitters > 300 keV). Images till liberation threshold are doable with a longer acquisition.

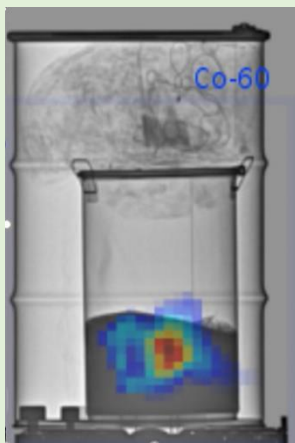
Thus, in one operation you can get:

- Isotope identification & spectrometry (Energy resolution < 1,5% @ 662 keV)
- Isotope specific 3D activity distribution images, allowing to identify contaminated areas allowing repackaging.
- Contamination quantification isotope by isotope
- Calculated dosimetry at skin possible.

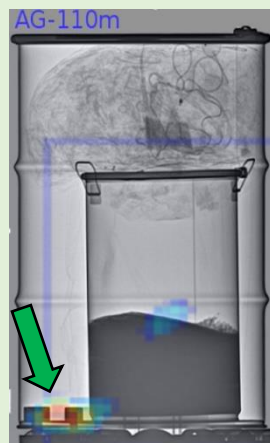


Why are Temporal δ cameras unique?

Spectrally resolved image



- 1332 + 1173 keV compton image
- ~5 MBq Co60
- Distance from axis = 0,9m
- 20' acquisition
- Overlaid on an Andra X ray image



- 885 keV compton image
- ~3 MBq Ag110
- Distance from axis = 0,9m
- 20' acquisition
- Overlaid on an Andra X ray image

Temporal δ is a new generation portable Compton gamma camera - spectrometer and imager - based on temporal imaging: a completely new detection concept backed by proprietary patents and software.

Temporal imaging uses both light and time distribution of each scintillation event to localize it very precisely in space (X-Y-Z), time (T) and energy (E).

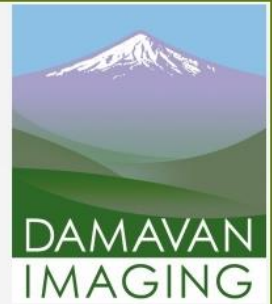
The use of large volume monolithic, high density, high Z_{eff} **CeBr3 crystals** having a low natural radioactivity and fast high yield scintillations guarantees very efficient and clean photon detection by Digital Si-PM.

Our asymmetric Compton concept, 300 ps time veto, and event selection scheme explain our camera good angular resolution and signal/noise.

Damavan Imaging was founded in 2014 to develop its Temporal Imaging patents. It won in 2015 a big grant from ANDRA (French Nuclear Waste Agency) to develop a Compton camera able to image low activity waste. In 2018 Damavan has won a H2020 European Award. Camera sales started in 2018.

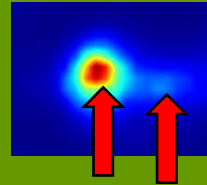
TEMPORAL δ Dream Scanner

See what's inside you waits in 3D



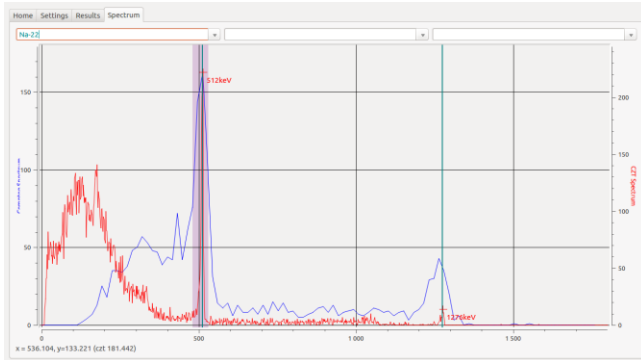
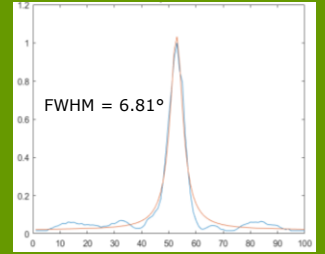
Imaging is done in Compton mode from 300 KeV to 3000 KeV overlaid on "natural" (96 x 96°) FOV optical images. Good angular resolution and image quality translates in more details reliably detected. The most precise imaging is obtained in energy-gated mode gating on a specific isotope line.

Camera Imaging performance :



Angular resolution test 8° ^{137}Cs
contrast 3/1

^{137}Cs (700 MBq) ^{137}Cs (220 MBq)



In **spectrometry and dosimetry**, the high sensitivity CeBr3 spectrum is complemented by an energy resolved CZT spectrometric detector (1.5% on ^{137}Cs) to allow reliable isotope identification in energy range 50 KeV-3 MeV with the help of a library, even in a completely "unknown" environment.

Energy and spatially resolved quantification of radiation can be done with the Compton head (300 KeV-3 000 KeV)

Usages: new cost & risk reduction possibilities in Waste management

Temporal δ can be used in nuclear power plants in operation or in decommissioning, fuel and waste treatment and storage centers, transportation and logistics units, laboratories, etc. It is an ideal tool for locating radioactive hot-spots, characterizing sources and mapping an area for **routine operations**: It is also suitable for **emergency situations and homeland security applications**.

It is **uniquely designed to image very low intensity sources**, (final release of decontaminated objects, field contamination...). Resolved images could be obtained from larger distance than with conventional cameras, thus **limiting the risks and the dose** for the operators. Temporal δ being a stable photon counter allows estimating **the mass of the source**, for ex. the mass of Uranium in a plugged pipe.

Specifications

Field of view	96 x 96 flat field	Timing Resolution	300 ps @ 511 KeV	Operating Temperature	-20°C to 40°C	Spectral resolution	<1.5% @ 662KeV
Sensitivity high flux	3mR/h < 1 mm	Angular resolution	< 8 degrees (full spectrum) 2D	Energy range	50 keV–3MeV (spectroscopy) 500 keV– 3MeV (imagery)	Count rate limit	>0,5 mSv/h
Sensitivity low flux	900 Bq Co ⁶⁰ on 1m ² @ 1m in 1,5h	Sensors	3 CeBr3 + CZT	Communication	Ethernet to laptop, Wi-Fi option possible	Power Source	110 – 220V (mains)