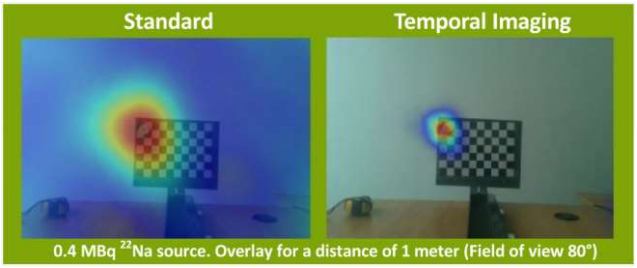
TEMPORAL δ COMPTON V3

THE BEST IMAGES YOU CAN GET ABOVE 511 KEV !

DAMAVAN IMAGING

Quick overview

- Light weight gamma camera - spectrometer and imager
- Breakthrough proprietary technology (9 patents)
- Very effective photons detection (50% more than other cameras)
- Ideal for identification and precise location of hotspots
- Real-time spectroscopy and isotope charcterization
- Precision overlay of gamma and optical images
- Large optical field of view, omnidirectional gamma sensing
- Precise and reliable gamma imaging (no artefacts)
- Fast &cost-effective area mapping, even of inaccessible areas
- Images both point and distributed sources
- Excellent imaging of extended sources
- Discrimination background and sources of interest in <1 min.
- Large energy range in spectrometry : 50-3000 KeV
- Best angular resolution in Compton mode: 6°-8°
- Excellent angular precision : ~1°
- Excellent energy resolution: <1.5% at 662 kEV
- Exceptional sensitivity (<1 nSv/h)
- Electronic collimation: switch-off strong sources outside the field of view and facilitate the imaging of weak sources
- Dose estimation
- Reduced dose exposure (ALARA)
- Integrated laser telemeter
- Fast and easy to use in all nuclear environments
- Short start-up, adapted for routine and emergency situations
- Independent power supply
- Air & water tight for easy decontamination (IP 65)
- 3D imaging capabilities



Field of view	100° x 100° flat field	Angular resolution	<10° (full spectrum) <6° (energy gated)
Sensitivity	0.3 µSv/h in 1 hour 1 kBq @1m in 2 hours 3 µR/h <1 min	Sensor	$CeBr_3$ & CZT
Timing resolution	300 ps@511 keV	Energy resolution	<1,5% @662 keV
Energy range	50 keV – 3 MeV (spectroscopy) 300 keV – 3 MeV (imaging)	Weight	3.9 kg
Count-rate limit	1 mSv/h	Power supply	110-220 v (mains)
Dimensions	210 x 290 x 160 mm	Battery Life	4 hours (external battery 1.2 kg)
Operating temperature	-20°C to +50°C	Communication	Ethernet Wi-Fi

Temporal δ is a compact portable **Compton gamma camera - spectrometer and imager -** based on completely new detection concept and technology with 9 proprietary patents - temporal imaging.

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).

Large volume **CeBr3 crystals**, known for their very low natural radioactivity and ability to generate very fast scintillations are used. The crystals are monolithic and guarantee a very homogeneous response/ Their ability to absorb gamma radiation is very high (Z=58, density=5.1 g/cm3), thus allowing a very effective detection - 50% more photons are captured with Temporal δ for the same period of time.

In spectrometry, the device can be used in energy ranges from 50 KeV to 3 MeV with an energy resolution of less than 1.5%. The characterization of isotopes can be done with great certainty using a library, even in a completely "unknown" environment.

In **imaging**, Temporal δ has the best performance on the market in the energy range from 400 keV to 3 MeV. The camera has an **optical field of view of 100° x 90°** and the gamma image can be precisely overlaid on the visible image taken by a built-in optical camera. The gamma sources can be detected even outside the field of view.

Temporal δ can image complex situations with several sources, of the same, or different nature. The electronic collimation, available in option, allows to **"switch-off" strong sources** and keep on the image the weak ones. So, excellent images of weak sources can be done even if they are near strong ones or in strong background radiation.

For an angular precision of about 1°, Temporal δ has the **best angular resolution** in Compton mode currently available on the market - less than 10° over the entire energy range and less than 6° for gated energy - against more than 15°-20° for other existing cameras. This makes it possible to quickly **distinguish very close multiple sources**, possibly of different nature and intensity, without having to approach too closely.

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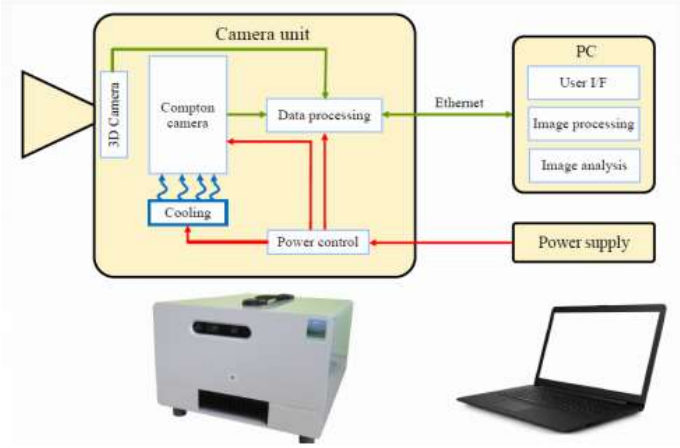
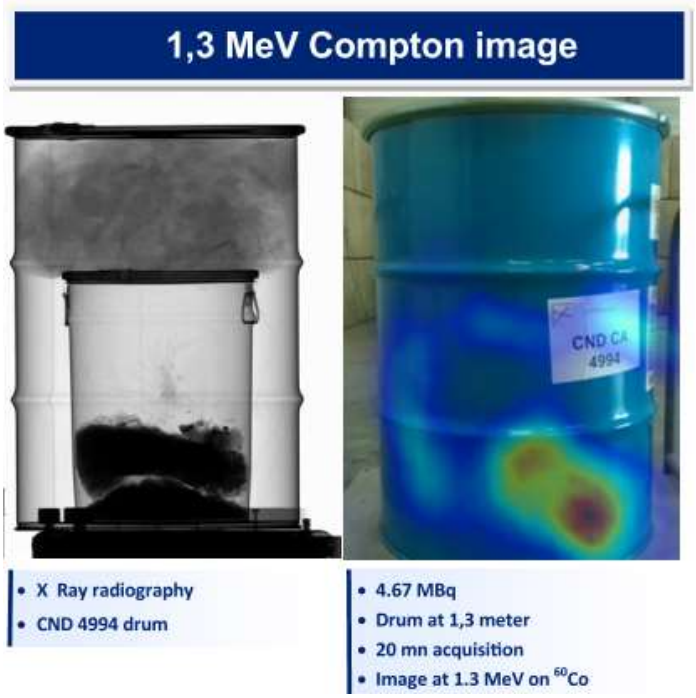
One of the major strengths of Temporal δ is its ability to generate **extremely precise and reliable gamma images** due to the exceptional signal-to-noise ratio (virtually no noise), even of very low-emission objects. Extremely short time vetoes - less than 300 ps vs. several nanoseconds for conventional cameras - are used and only valid Compton events are retained. Most of the scattered photons are eliminated, so are incoherent events or those not respecting the Compton equations. Unlike other cameras, especially ones with coded aperture, the **reliability of the images is exceptional**, almost no artefacts are generated and the gamma image correspond to the reality.



Its **exceptional sensitivity** (<1 nSv/h for an average level of natural radioactivity of ca. 300 nSv/h!) and **efficiency** allow the localization and the imaging of very low intensity radioactive sources with long exposures and those of intense sources very quickly.

Exploitable images from intense sources can be obtained from distances 2 to 3 superior to existing cameras, thus **limiting the risks and the dose** for the operators. Temporal δ can produce images of point sources, but of extended sources as well, it can discriminate background radiation and sources of interest in less than 40 seconds.

The creation of gamma images of the radiological situation and the identification of isotopes are also done with **very short exposure times**. Thanks to the Temporal δ innovative technology, some 50% more photons are captured within the same period of time than with conventional gamma cameras and **the acquisition is 30% to 50% faster**. An exploitable image of a point source is obtained with some 50 captured photons only.



The camera can be used at **all types of nuclear sites**: operating and decommissioned power plants, fuel and waste treatment and storage centers, transportation units, laboratories, etc. It is an ideal tool for locating radioactive, characterizing sources and mapping an area for **routine operations**:

- shutdown - restart of reactor units, maintenance, etc.;
- dismantling of nuclear sites;
- transportation of radioactive material and waste;
- inspection, treatment, storage of radioactive materials.

Its advanced performance features and very short start-up (less than 5 minutes) make it also perfectly suitable for **emergency situations**.

It can be also used for **internal security controls** of illicit gamma sources.

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