Gamma ray Compton TOF detector

DESCRIPTION OF THE TECHNOLOGY

CSIC and a Spanish University has designed a device to allow determination of the complete timing and photoelectric interactions produced by a single incident gamma ray, so the contribution of scattered events inside the photoelectric peak coming from scatter at the crystal or the human body can be estimated and accurately corrected.

Gamma ray imaging is a key techonology for the design of medical devices based on Nuclear imaging systems like Single-Photon Emission Computed Tomography (SPECT) or Positron Emission Tomography (PET) for the purpose of medical diagnosis or therapy, but also for astrophysical devices such as gamma ray telescopes or even nuclear power plant monitoring. All these devices are based on the determination of the impact position of gamma ray interactions due to Compton scattering. One of the major challenges of analyzing data from a combined Compton camera is the reconstruction of the parameters of each original gamma ray from the measured data. This is a handicap in current Nuclear Medicine devices.

Our device consists of a gamma ray Compton TOF camera system capable to obtain the 3D position and energy of the interactions and their relative timing by means of accurate determination of the TOF for each interaction. The combination of geometrical design and high timing resolution of the system of the invention allow determination of the full temporal sequence of all gamma ray interactions inside the detector.

MARKET APPLICATION SECTORS

Company for medical device industry

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

- A wide range of applications: medical diagnosis, dose monitoring during irradiation in hadron therapy, gamma ray telescopes, monitoring of decommissioning of nuclear power plants and homeland security
- A better sensitivity in commercial scanners (PET and SPECT) without degrading image. Allows to have more information of the obtained image
- Improves image quality by a more efficient elimination of random and scattered events

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CURRENT STATE OF DEVELOPMENT

Technology development needs to be marketed by companies in the instrumentation sector.

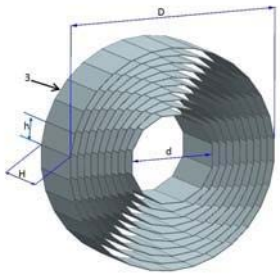
INTELLECTUAL PROPERTY RIGHTS

Spanish priority application filed

COLABORATION SOUGHT

Industrial development and licensing partners are sought in these sectors medical diagnostics, astrophysics and safety.

RELATED IMAGES



Detector module layers for PET applications

CONTACT

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