IDF INNOV

From invention to innovation

GAMMA CAMERA

Exposure levels to electromagnetic radiations for medical imagery can be reduced by a factor of 100, thanks to a new generation of gamma cameras integrating an original microlens array technology

Gamma camera ▪ PET and SPECT scanners ▪ CMOS

APPLICATIONS

- Gamma Camera for PET and SPECT scanner
- Hodoscope (spatial applications)

DEVELOPMENT PHASE

Numerical simulations of the hodoscope and optical system.
Prototype of gamma camera currently under design.

PUBLICATIONS

"The Gamma Cube: a new way to explore the gamma-ray sky"

INTELLECTUAL PROPERTY

Demande PCT : WO2014154556, filed on March 20, 2014

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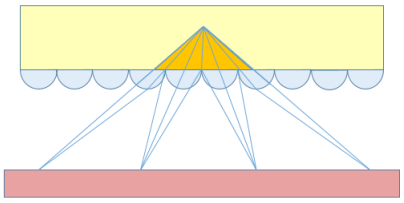
PRESENTATION

Gamma cameras have become a mainstream technology for medical imagery. But current PET and SPECT scanners use gamma cameras which mostly have a low sensibility, hence the need of high levels of electromagnetic radiations. Furthermore, 3D images require to use several gamma cameras working by pair, on both sides of the body, so that the price of PET and SPECT scanners can reach several millions of euros.

Our solution consists of using a plenoptic camera, which was designed for spatial applications in the first place, and which is currently being adapted for medical imagery. The plenoptic camera uses a coded mask with an efficiency of 10 to 13% versus 0,1% for mainstream gamma cameras (Anger cameras), hence the possibility to reduce by a factor of 100 the dose of the radioactive product injected in the patient.

Furthermore, the plenoptic camera uses a microlens array enabling 3D imagery with a single gamma camera, and low cost CMOS electronics to compute the 3D image, leading to downsize the costs of PET and SPECT scanners.



Microlens array for imaging a scintillator in a high resolution gamma camera 2015 © IDF Innov

COMPETITIVE ADVANTAGES

- Efficiency (10-13% vs 0.1% for collimator gamma camera) allowing a 100-fold decrease of the amount of radioactive tracer inoculated to the patient
- Spatial resolution (1 mm)
- Limited weight (no collimator)
- Access to 3D information with a single gamma camera
- CMOS electronics