ID de la contribución : **52** Tipo : **no especificado**

IRIS Innovative detectors for medical applications

jueves, 9 de mayo de 2024 18:30 (15)

The IRIS group of IFIC (http://ific.uv.es/iris) has specialized on the development of innovative technology for medical imaging.
Compton cameras are showing promising results in different medical imaging areas. The group has wide expertise in the development of Compton cameras for medical applications. Starting from a basic prototype, the group has improved its capabilities and modified the system towards the requirements two applications: protontherapy treatment monitoring and assessment of radionuclide therapy.
The system is based on LaBr3 crystals coupled to SiPM arrays. The initial prototype, which has now reached the third version (MACACO III) employs the ASIC VATA64HDR16, driven by the AliVATA readout board. In the latest version (MACACO III+), employed for radionuclide therapy assessment the device features two planes, the first one composed of one detector and the second one with four detectors. The system has shown very promising results in this application.

An altenative version (MACACOp) has been developed employing the ASIC TOFPET2 from PETSYS, in order to improve the timing resolution and readout speed for proton therapy treatment monitoring. This ASIC has also enlarged the detector dynamic range. After the successful tests carried out with the two systems at the Krakow protontherapy centre, the device has been tested at the Quironsalud protontherapy centre in Madrid, being able to reconstruct the prompt gamma distribution in the challenging conditions imposed by the accelerator. The last version, known as FALCON, also features four detectors in the second plane.

Also for this last application, the group is working on the development of a coaxial prompt gamma monitoring device. The work is focused on the development of an ultra-fast data acquisition system capable of digitizing signal waveforms at 2.5 Gsps. Up to 50 second long waveforms of a CeBr3 scintillator at 3 MHz coupled to a fast PMT are stored without any dead-time and processed off-line for pile-up deconvolution.

Primary author(s) : LLOSÁ, Gabriela (IFIC (CSIC-UV))

Presenter(s) : LLOSÁ, Gabriela (IFIC (CSIC-UV))

Clasificación de la sesión : Applications WG

Clasificación de temáticas : Applications