

Contribution ID: 4

Type: **not specified**

# Integration of the HiRezBrainPET with a clinical PET/CT system: Performance evaluation of a prototype for next-generation brain tomography

*Thursday 9 February 2023 12:20 (15 minutes)*

Positron emission tomography (PET) is an extremely sensitive technique of medical diagnosis. A radioactive marker is injected in the patient's body, releasing positrons in the zone to study. When the positrons encounter electrons from neighboring molecules, they annihilate, producing two energetic photons traveling in opposite directions. These photons are identified by the surrounding detectors to create detailed images of the organism and to monitor dynamic processes. This line of work has been pursued by the RPC team at LIP for a number of years.

A high-resolution, small animal RPC-PET scanner developed at LIP is installed at ICNAS since 2014. Hundreds of tests have been performed in mice, with goals such as studying degenerative diseases or testing new drugs. This technology is now being applied for human brain PET, in the framework of the project HiRezBrainPET: neurofunctional cerebral imaging by high resolution positron emission tomography, led by ICNAS-Produção, with LIP at its main R&D partner

In 2021 all components of the HiRezBrainPET, mostly designed at LIP, have been built. The system has been fully assembled and is ready to start performance evaluation tests. The main objectives of this project are to evaluate the imaging performance of the HiRezBrainPET and study the possibility of integrating this prototype with a clinical PET/CT scanner installed at ICNAS.

This work will contribute to the development and improvement of dedicated brain PET tomography, which ultimately intends to address the currently unmet clinical needs in neurosciences. This equipment has the potential to change the paradigm in the diagnosis and investigation of diseases of the central nervous system by allowing, for example, to see small brain structures involved in neuropsychiatric diseases. The high spatial resolution of the system may play an important role in the characterization of vascular injury or tumours, allowing for better treatment planning.

**Author:** LOPES, Miguel

**Presenter:** LOPES, Miguel