

PetVision planar TOF-PET detector development

Thursday, 4 December 2025 10:00 (30 minutes)

Increasing healthcare demands and the need for earlier diagnosis are driving the development of PET systems that are both more affordable and more flexible. We present a modular time-of-flight (TOF) PET concept that utilises fast scintillators, state-of-the-art SiPMs, and efficient high-speed readout electronics to achieve high timing precision. Accurate TOF information improves event localization along the line of response, reducing image noise and enabling high-quality imaging even when angular coverage is significantly reduced. This enables the replacement of conventional full-ring PET scanners with open, flat-panel detector geometries that simplify construction, reduce costs, and allow operation in environments where traditional systems cannot be used, such as surgical suites, emergency rooms, upright imaging stations, and mobile units.

This work is carried out within the Horizon Europe EIC Pathfinder project PetVision. In the presentation, we will summarise the project objectives and progress in detector development, including results from system-level simulations and component-level measurements achieving coincidence timing resolutions below 100 ps FWHM. Such timing performance is essential for maintaining image quality with reduced angular coverage. These results support the development of future TOF-PET systems that can be adapted to a wide range of clinical and resource-limited settings.

Author: LOZAR, Andrej (Jozef Stefan Institute (SI))

Presenter: LOZAR, Andrej (Jozef Stefan Institute (SI))

Session Classification: Exotic atoms: fundamental aspects, applications and advances in radiation detectors