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The PETALO project

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PETALO (Positron Emission TOF Apparatus with Liquid xenOn) is a new technique that uses liquid xenon (LXe) together with a SiPM-based readout and fast electronics to provide a significant improvement in PET-TOF technology. Liquid xenon allows to build a continuous detector with a high stopping power for 511-keV gammas and provides a uniform response avoiding most of the geometrical distortions of conventional detectors based on scintillating crystals. In addition, SiPMs enable a fast and accurate measurement of the energy with a small dark count rate at the low temperatures required from LXe. PETit, the first PETALO prototype built at IFIC (Valencia), started operation in July 2021. It consists of an aluminum box with one volume of LXe and two planes of SiPMs that register the scintillation light emitted in xenon by the gammas coming from a Na22 radioactive source.

In this talk I will review the potential of the LXe technology for full-body PET scanners and present the first measurements performed with PETit.

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