

XeSAT2022 - International Workshop on Applications of Noble Gas Xenon to Science and Technology



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Overview and Status of the PETALO project

PETALO (Positron Emission TOF Apparatus with Liquid xenOn) is a new concept in the field of Medical Imaging aiming to demonstrate that liquid xenon (LXe) together with a SiPM-based readout and fast electronics, provide a significant improvement in PET-TOF technology. Liquid xenon allows a continuous medium with a high stopping power for 511-keV gammas as well as 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 noise contribution 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 a unique volume of LXe and two planes of SiPMs that register the scintillation light emitted in xenon by the gammas coming from a Na^{22} radioactive source. After some months of data taking PETit is expected to demonstrate the potential of the technology, providing measurements of the most relevant features: reconstruction of the position, energy and time of the interactions.

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