

Modular J-PET applications in medical and particle physics

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J-PET is the first facility of its kind developed for applications in both medical and particle physics [1]. Recently, a new prototype based on modular construction (24 modules) is commissioned [2]. Each module is made of 13 plastic scintillators and can be used as a standalone, compact, and portable detection unit. In the framework of J-PET, the decays of positronium atoms in their ground state are being studied. Several odd-symmetric operators are constructed out of the momentum vectors of annihilation photons originating from the decays of metastable o-Ps atoms [1]. The spin of the o-Ps atom can also be accessed by reconstructing the 3D vertex positions of o-Ps annihilations. Few operators utilize the photon's polarization direction which is the unique feature of the J-PET detector. The specifics of Modular J-PET and its applications will be discussed.

[1] P. Moskal, PET Clin. 15 (2020) 439-452; P. Moskal et al, Acta Pys. Pol. B 47, 509 (2016)

[2] E. Czerwiński, Cern courier 2018

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