

J-PET detector NEMA spatial resolution studies

M. Pawlik-Niedźwiecka^{1,*}, Sz. Niedźwiecki¹ on behalf of J-PET collaboration

¹*Faculty of Physics, Astronomy and Applied Computer Science, Jagiellonian University,
prof. Stanisława Łojasiewicza 11, 30-348 Kraków*

* email: monika.pawlik@doctoral.uj.edu.pl

J-PET detector, based on long plastic scintillator strips, was recently constructed in Jagiellonian University [1]. It consists of 192 modules axially arranged into three layers, read out from both sides by digital constant-threshold boards. Each signal is probed at four different thresholds. Synchronization detection modules has been completed with a reference detector placed inside scanner.

J-PET scanner may be licensed for commercial use after fulfilling standards defined by The National Electrical Manufacturers Association (NEMA). To determine performance characteristics of J-PET detector a NEMA-NU-2 [2] norms are used which specify the standard values of the spatial resolution, signal-to-background ratio and scattered gamma fraction. Therefore, it is necessary to carry out appropriate testing of the J-PET prototype which results will be used for device certification [3].

In this poster initial results of the J-PET spatial resolution will be presented for ²²Na source placed at selected positions inside the detector chamber as well as time and energy resolutions for detection modules.

[1] P. Moskal, Sz. Niedźwiecki et al., Nuclear Instruments and Methods in Physics Research Section A 764, 317 (2014)

[2] NEMA-NU-2 standard - <https://www.nema.org/>

[3] L. Raczyński et al., Physics in Medicine & Biology 62, 5076 (2017)