

The J-PET tomograph as an advanced, multifunctional detection system for applications in medical imaging and fundamental research

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The Jagiellonian Positron Emission Tomograph (J-PET) is the first modular and portable multi-photon PET scanner, which is a multidisciplinary detection system used in medical imaging as well as in fundamental research including discrete symmetry tests in positronium decays [1,2]. In addition to standard PET imaging, the J-PET scanner allows the positronium lifetime imaging in the human body [3,4,5]. The first ever in-vivo image of positronium in the human brain recently obtained using a J-PET scanner [5] shows the huge potential of this new diagnostic method in the future.

I am going to present research performed with the J-PET facility regarding both fundamental studies and medical imaging.

[1] P. Moskal et al., Nature Communication 12, 5658 (2021).

[2] P. Moskal et al., Nature Communication 15, 79 (2024).

[3] P. Moskal et al., Nature Reviews Physics 1, 527 (2019).

[4] P. Moskal et al., Science Advances 7, eabh4394 (2021).

[5] P. Moskal et al., Science Advances 10, eadp2890 (2024).

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