Reconstruction of hit-time and hit-position of annihilation quanta in J-PET detector using synchronized model signals

N. G. Sharma* for J-PET collaboration

1 Faculty of Physics, Astronomy and Applied Computer Science, Jagiellonian University, 30-348 Cracow, Poland

* email: pnp.neha@gmail.com

The Jagiellonian Positron Emission Tomograph is an cost-effective scanner [1] being developed at the Jagiellonian University, Krakow. It is composed of long strips of organic scintillators. This detecting system is also capable to study the decays of positronium atoms [2]. In the J-PET detector the amplitude of signals used for reconstruction is strongly dependent on the hit-position of gamma quanta, not on the energy deposited by it. Therefore, a novel reconstruction method based on the comparison of examined signal with the model signals stored in the library using Mahalanobis distance has developed [3]. The method has validated on two strip J-PET module. In the present article results obtained from the validation of reconstruction method will be presented and discussed.

Keywords: J-PET detector, J-PET two strip module, mahanalobis metric