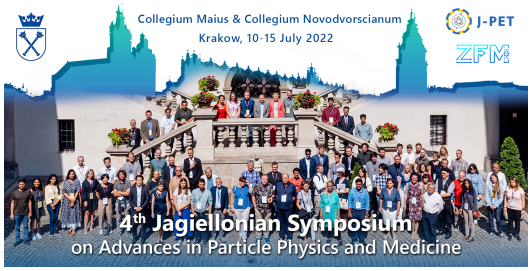

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Double photon coincidence detection method for gamma-ray imaging in medicine

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Authors: Mizuki Uenomachi, Kenji Shimazoe, Hiroyuki Takahashi

Positron emission tomography (PET) utilizes the coincidence detection of annihilation gamma-rays with energy of 511 keV produced after a positron-electron collision. The positron position can only be constrained on a line connecting the detection points because two annihilation gamma-rays emit at the opposite direction. On the other hands, some nuclides emit successive gamma-rays via an intermediate state with a short duration such as 111In, 177Lu, 60Co, and so on. These successive gamma-rays are emitted at almost isotropic direction; thus, the radionuclide location can be identified by using direction-resolving radiation detection system. We have exemplified the position identification capability of double photon coincidence method by applying to Compton imaging and mechanical collimation-based gamma-ray imaging. Moreover, we have demonstrated its crosstalk reduction capability in multi-nuclide Compton imaging. In the presentation, we will show the experimental results of the double photon coincidence method application.

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Session Classification: Poster session & Coffee & Conference photo I