Contribution ID: **88** Type: **Talk**

Development of an ultrahigh resolution 1mm Si-PM array based GGAG alpha camera with gamma rejection capability

Thursday 7 September 2023 16:45 (20 minutes)

For precise distribution measurements of alpha particles such as those required in alpha radionuclide therapy research, a high-resolution alpha particle camera is desired. Although combining a thin scintillator with a photodetector such as position sensitive photomultiplier (PSPMT) or silicon photomultiplier (Si-PM) array is a possible method to develop an event-by-event based alpha camera, the spatial resolution is so far limited around 1.0 mm FWHM. To overcome the limitation, we employed a 1 mm channel size Si-PM array combined with a thin GGAG plate to form an alpha particle imaging detector and evaluated the performance. For the developed alpha particle imaging detector, a Si-PM array with 1 mm x 1 mm channel size arranged 8 x 8 was optically coupled to a 1mm thick GGAG plate with a 1-mm-thick light guide between them. Since the decay times of GGAG are different between alpha particles and gamma photons, we could separately measure alpha particle and gamma photon images using pulse shape discrimination. The spatial resolution of the developed alpha was 0.2 mm FWHM and the energy resolution was 11 % FWHM for 5.5 MeV alpha particles. We could separately measure the alpha particle and gamma photon images using pulse shape discrimination. The developed camera is promising for distribution measurements of alpha particles as well as gamma photons where high resolution is required.

Your name

Seiichi Yamamoto

Institute

Waseda University

Email address

seiichiyamamoto0000@gmail.com

Authors: Dr KATAOKA, Jun (Waseda University); YAMAMOTO, Seiichi (Waseda University)

Presenter: YAMAMOTO, Seiichi (Waseda University)

Session Classification: Application in life sciences and biology

Track Classification: Applications in Life Sciences, Biology & Medicine