

Development of two-dimensional neutron imager with a sandwich configuration

It is known that neutrons can be measured with a high spatial resolution of several microns by combining a charged particle conversion layer and a semiconductor pixel sensor [1]. Its spatial resolution is limited by an electrical noise and the flight range of secondary particles within the sensor volume from the conversion layer.

In order to reduce the effect of secondary particle flight distance, we have developed a device with a new configuration in which a conversion layer is sandwiched between active sensors and two emitted particles are simultaneously measured. We are considering using the new configuration for verification experiments of the equivalence principle in a microscopic scheme. In this presentation, we report the results of the first simultaneous measurement.

[1] Y. Kamiya, T. Mitoshio, H. Iwase et. al., Development of a neutron imaging sensor using INTPIX4-SOI pixelated silicon devices, Nucl. Instrum. Methods A, 979, 164400, (2020).

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