reverse 1eakage current of each strip is less than 1.2 nA. Performances in terms of energy resolution was measured with a 241 Am source. Results are presented in Fig. 5. It is shown that the p⁺ implant strips have an energy resolution of 2.6 % for 5.486 MeV of 241 Am α particles. Further in-beam experiments will be carried out at HIRFL to measure the radiation-hardness effect of this kind of detector.



Fig. 4 C-V characteristics measured at 20 $^{\circ}\mathrm{C}$ for deep diffused detector



Fig. 5 (color online) Energy resolution of 2.6 % for 5.486 MeV $^{241}{\rm Am}$ α particles.

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5 - 7 Progress on Study of the CsI(Tl) Crystal Array

Shi Guozhu, Chen Ruofu, Li Songlin, Li Hengyuan and Shen Aihua

The CsI(Tl) crystal is regarded as all-important material for its excellent characters in high-energy physics experiments and used as the electro-magnetic calorimeters(EMC) to measure the energy and position of highenergy γ -ray and electron^[1-3]. It has higher detection efficiency and sensitivity for X- and γ -ray with the advantage of higher density, higher light yield, not to be easily deliquesced, and without vacuum packaging.

In recent years, the Crystal Detector Group in IMP has improved the processing technology and produced the CsI(Tl) crystals with different size in order to meet requirements from more and more new fields. Now we are able to develop the CsI(Tl) crystal array with the different size.

In the present work, we focus on measuring position resolution of the CsI(Tl) crystal array with the IQSP518 measuring system. The PhotoniQ Model IQSP518 is an economical multi-channel data acquisition system designed for scientists, engineers, and developers as an off-the-shelf solution for data collection from multiple charge-based sensors. Implemented as a stand-alone laboratory instrument with a PC interface, the PhotoniQ is used for charge integration and data acquisition from individual photomultiplier tubes, avalanche photodiodes, and silicon photomultipliers (SiPM). Available in a standard configuration of two input channels, the IQSP518 can be expanded in the factory or field up to eight parallel channels. Flexible, intelligent triggering and acquisition modes allow the unit to reliably capture event or image data using sophisticated data acquisition techniques. The IQSP518 is fully configurable through its USB 2.0 port using an included graphical user interface. Continuous high speed data transfers to the PC are handled through this interface, and for custom applications through the provided Windows DLL set.

In summary, the results of the CsI(Tl) crystal array(Block: 23×23 , Pixel: 1 mm×1 mm×7.5 mm) are obtained coupled with Hamamatsu H8500 photomultiplier tube (PMT) in the IQSP518 measuring system, including onedimensional position resolution spectrum and two-dimensional scatter spectrum, details are shown in Figs. 1, 2, and 3. Fig. 2 shows the position resolution, in which X direction is 0.58 mm and Y direction is 0.63 mm. Fig. 3 shows the two-dimensional scatter spectrum of the CsI(Tl) crystal array.



Fig. 1 The different size of the CsI(Tl) crystal array.



Fig. 2 One-dimensional position resolution spectrum on X and Y direction.



Fig. 3 The two-dimensional scatter spectrum of the CsI(Tl) crystal array.

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5 - 8 Recent Progress of High Energy Electron Radiography Research Platform in Lanzhou

Cao Shuchun, Zhang Ziming, Xu Junkui, Liu Ming, Shen Xiaokang, Zong Yang, Zhu Yunliang, Zhou Youwei, Wang Yanru, Li Zhongping, Zhao Quantang, Xiao Rongqing, Jing Yi and Wei Gai

High Energy Electron Radiography (HEER) is a new method suitable for High Energy Density Physics (HEDP) research that uses a high energy electron beam as a probe for time resolved imaging measurements of high energy density processes in materials^[1]. A High Energy Electron Radiography Research Platform (HEERRP) based on a 50 MeV Electron Linac (e-Lianc) which was designed for experimental research of HEER has been proposed by Electron Accelerator Group in IMP. This e-Linac has two injection beam lines, one is a thermionic RF gun with Alpha Magnet and Quadrupole magnets, and the other is a photo-cathode RF gun with emittance compensation Solenoid, see the Fig. 1, and parameters details see the Table 1. The experimental terminals of this e-linac have been designed for HEER and the Thick Target X-ray imaging.