Institute of High Energy Physics Chinese Academy of Sciences

Beta source test for TaichuPix3 chip

Tianya Wu, Wei Wang, Ziyue Yan

wuty@ihep.ac.cn
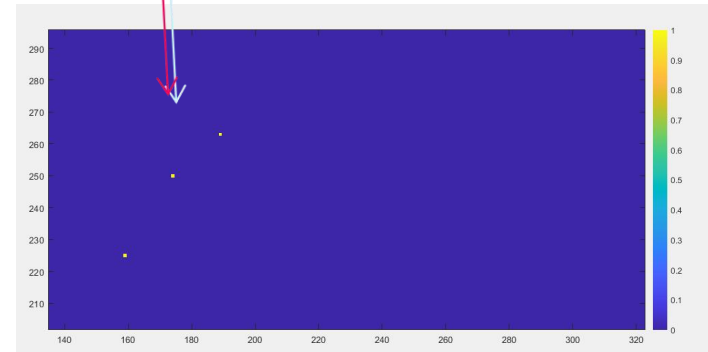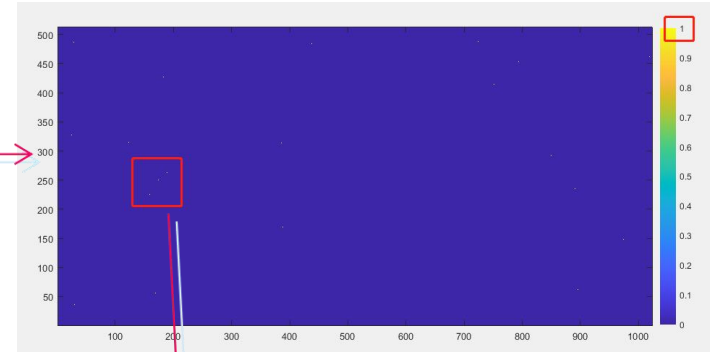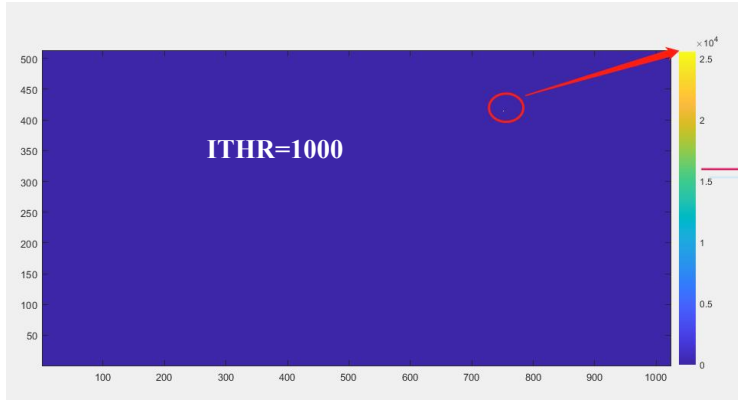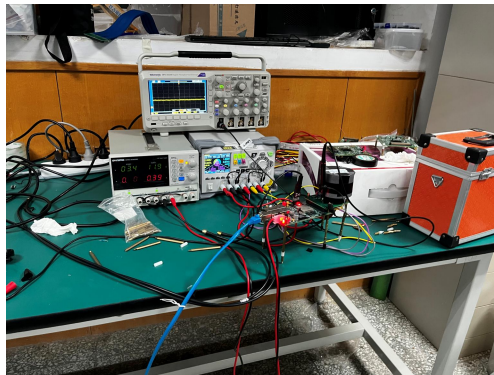
CEPC

Circular Electron Positron Collider

TaichuPix3 without injected charge

ITHR=1000

- ITHR =1000, open all the pixels
- Noisy pixel can reach a hits over 25000 times.
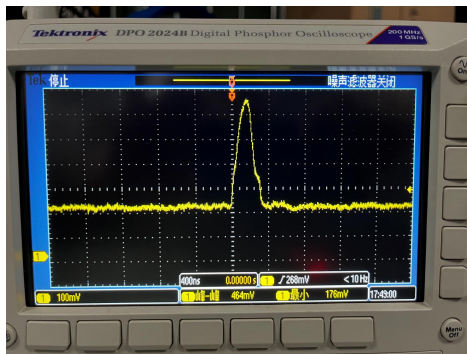
Inject beta ray from backside
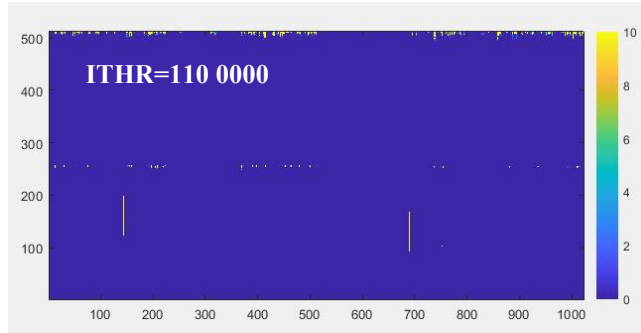
ITHR=110 0000

- ITHR =110 0000, open all the pixels,Only Noisy pixel can be read out.

- ITHR =1111 1111, open all the pixels, some pixels had responses, and the backside PCB shield a big region of pixels

- Noisy pixels read out for over 10000 times

ITHR=1111 1111
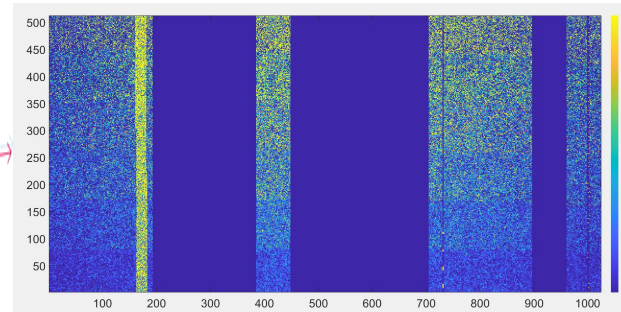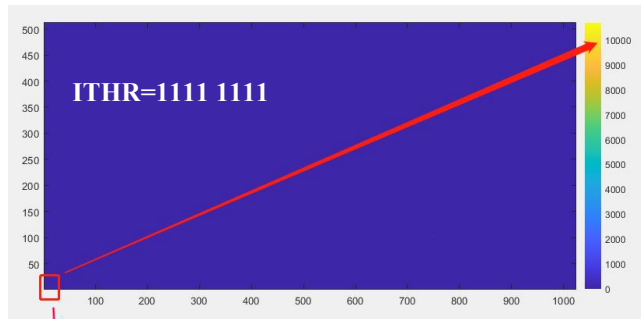
move the source to the right edge
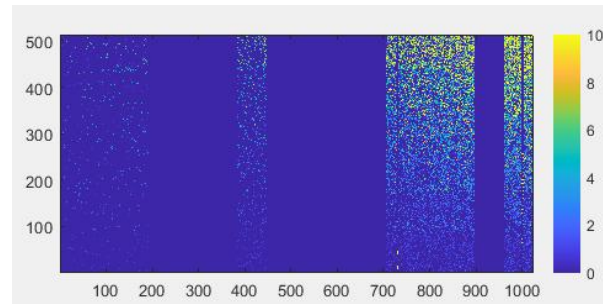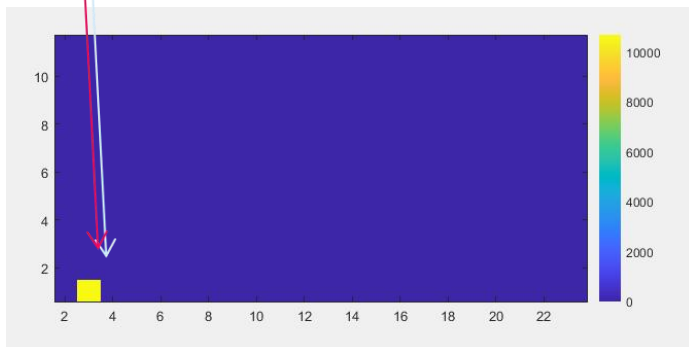
Inject bata source from the front

- ITHR =1100, open a specific region， less noisy pixels
- Noisy pixel can reach a hits over 1200 times, it indicates the masking process is not absolutely correct.(May the delay be not enough)
- As the ITHR rise to 11000, the noisy pixels decreased

Data analysis

- ### ITHR =1100, noisy pixels exit

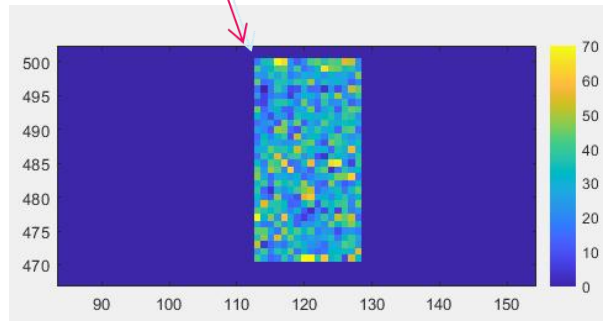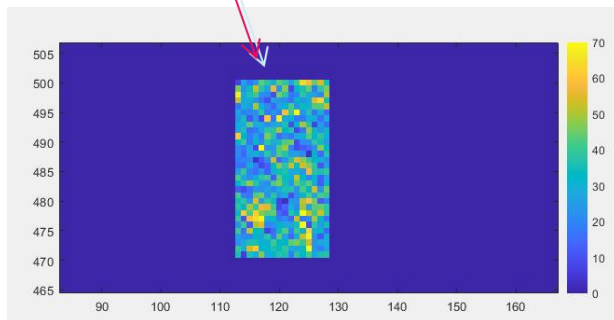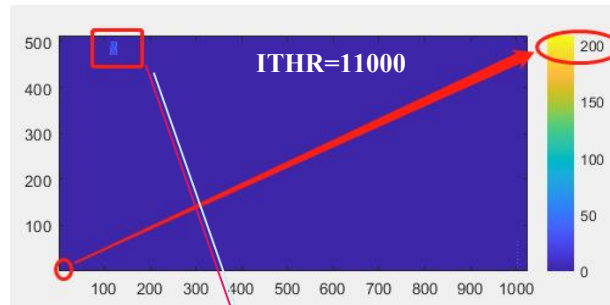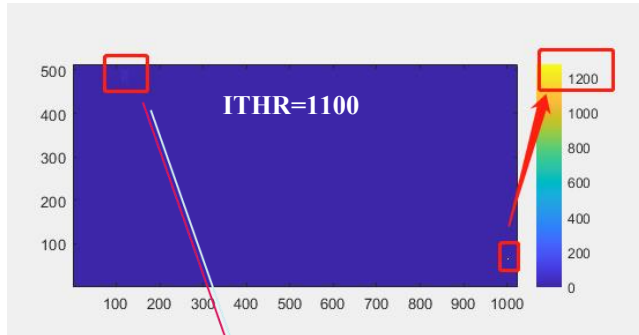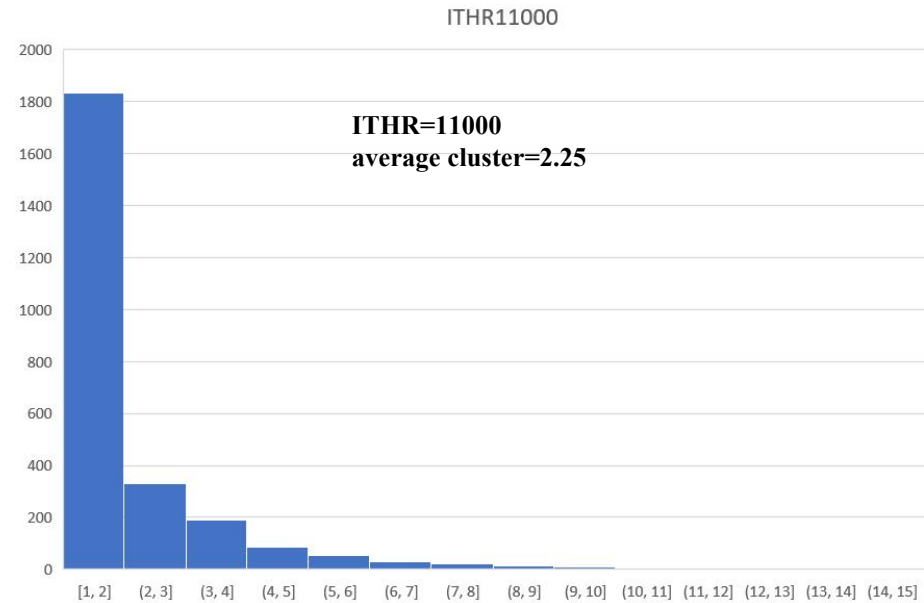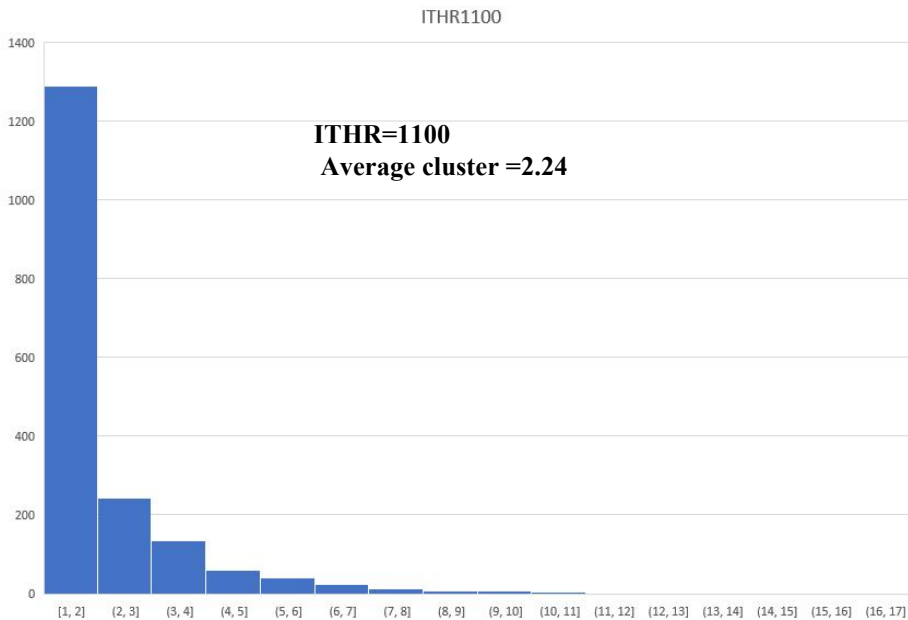| 1	214	500	129	0	20	248	43	10
1	31	56	991	0	20	248	43	96
1	31	56	992	0	20	248	43	96
1	31	56	992	0	20	248	43	96
1	31	56	992	0	20	248	43	96
1	31	56	992	0	20	248	43	96
1	31	56	992	0	20	248	43	96
1	31	56	992	0	20	248	43	96
1	223	59	960	0	20	248	43	128
1	223	59	959	0	20	248	43	128
1	223	59	959	0	20	248	43	128
1	223	59	959	0	20	248	43	128
1	223	59	959	0	20	248	43	128
1	223	59	959	0	20	248	43	128
1	223	59	959	0	20	248	43	128
1	224	58	961	0	20	248	43	128
1	224	58	958	0	20	248	43	128
1	224	58	958	0	20	248	43	128
1	224	58	958	0	20	248	43	128
1	224	58	958	0	20	248	43	128
1	224	58	958	0	20	248	43	128
1	224	58	958	0	20	248	43	128
1	130	500	129	0	20	248	49	8
1	213	500	129	0	20	248	49	251
1	84	500	129	0	20	248	53	1
1	159	500	129	0	20	248	53	224
1	161	500	129	0	20	248	55	102
1	108	59	962	0	20	248	59	48
0	128	1	0	0	12	221	204	221
1	108	59	961	0	20	248	59	48
1	108	59	961	0	20	248	59	48
1	108	59	961	0	20	248	59	48
1	108	59	961	0	20	248	59	48
1	108	59	961	0	20	248	59	49
1	108	59	960	0	20	248	59	49
1	108	59	960	0	20	248	59	49
1	108	59	960	0	20	248	59	49
1	108	59	960	0	20	248	59	49
1	108	59	960	0	20	248	59	49
1	108	59	960	0	20	248	59	49
1	52	500	129	0	20	248	60	188
1	64	500	129	0	20	248	63	39

- ### ITHR =11000, noisy pixels exit

1	59	63	983	0	18	5	51	179
1	59	63	983	0	18	5	51	179
1	59	63	983	0	18	5	51	179
1	59	63	983	0	18	5	51	179
1	59	63	984	0	18	5	51	179
1	59	63	984	0	18	5	51	179
1	59	63	984	0	18	5	51	179
1	59	63	984	0	18	5	51	179
1	59	63	984	0	18	5	51	179
1	59	63	984	0	18	5	51	179
1	144	62	991	0	18	5	55	183
1	144	62	990	0	18	5	55	183
1	144	62	989	0	18	5	55	183
1	144	62	961	0	18	5	55	183
1	144	62	988	0	18	5	55	183
1	144	62	988	0	18	5	55	183
1	144	62	988	0	18	5	55	183
1	144	62	988	0	18	5	55	183
1	144	62	988	0	18	5	55	183
1	144	62	988	0	18	5	55	183
1	148	61	989	0	18	5	55	183
1	148	61	989	0	18	5	55	183
1	148	61	989	0	18	5	55	183
0	128	1	0	0	12	221	204	221
1	148	61	989	0	18	5	55	183
1	148	61	989	0	18	5	55	183
1	148	61	989	0	18	5	55	183
1	151	63	991	0	18	5	55	183
1	151	63	991	0	18	5	55	183
1	151	63	991	0	18	5	55	183
1	151	63	991	0	18	5	55	183
1	151	63	991	0	18	5	55	183
1	151	63	991	0	18	5	55	183
1	125	61	973	0	18	5	57	32
1	125	61	973	0	18	5	57	32
1	125	61	972	0	18	5	57	32
1	125	61	972	0	18	5	57	32
1	125	61	972	0	18	5	57	32
1	125	61	972	0	18	5	57	32
1	125	61	972	0	18	5	57	32

Cluster size caculation

ITHR1100

ITHR=1100
Average cluster =2.24

ITHR11000

ITHR=11000
average cluster=2.25

Thanks for your attention!