Status of the FPCCD software

Physics and Software meeting

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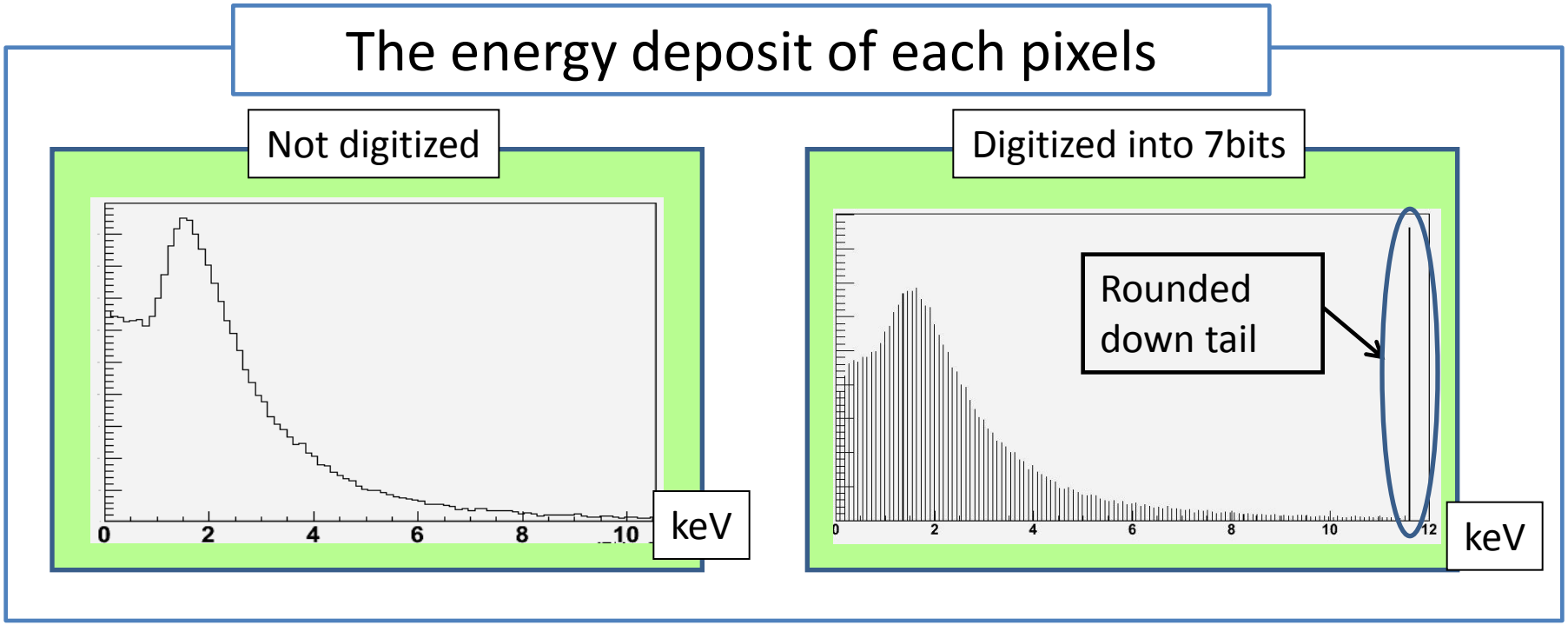
Today's report

- FPCCD Clustering
  - The digitization of the energy deposit was implemented.
  - The position resolution was checked.

- Pair background with short range cut
  - Range cut : 1 um, 10um
  - The occupancy was checked.

The digitization of energy deposit

- FPCCD Clustering processor was enabled to digitize the energy deposit.
  - # bits, bin width are variable.

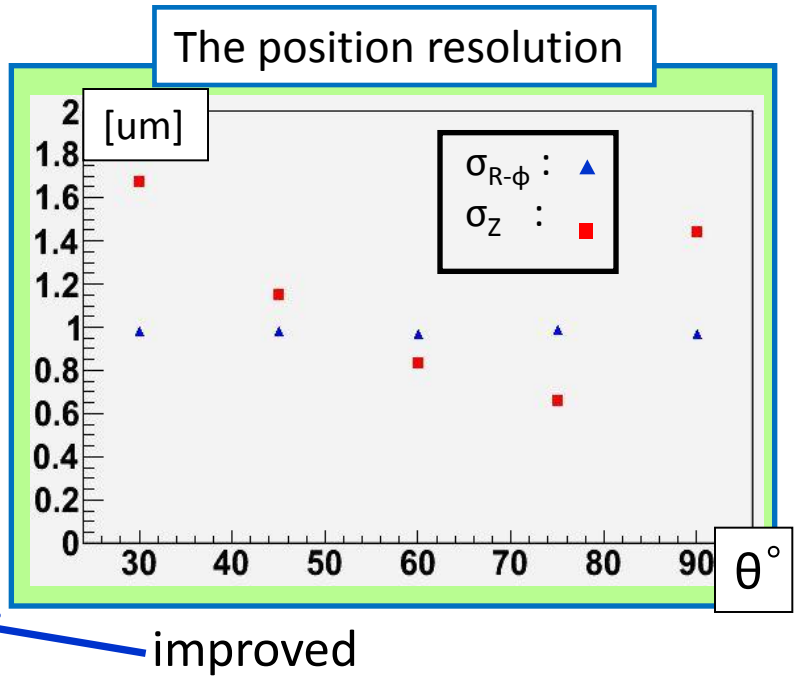


- The energy deposit is digitized correctly.

The position resolution

- The position resolution when the energy deposit is digitized.
  - Digitized into 7bits, bin width : 25 electrons
  - Noise rate : 50 electrons /pixel
  - Threshold : 200 electrons /pixel

θ	$\sigma_{Z[um]}$		$\sigma_{R\text{-}\phi[um]}$	
	Not digitized	digitized	Not digitized	digitized
90°	1.4 →	1.4	0.94 →	0.97
75°	0.64 →	0.66	0.96 →	1.0
60°	0.83 →	0.84	0.96 →	0.98
45°	1.12 →	1.14	0.96 →	0.98
30°	1.6 →	1.7	0.98 →	0.95



improved

- Overall, the resolution were worse 1 ~ 5 % at digitized.
- The resolution may be improved by the effect of cutting off the large fluctuation.

Pair background range cut study

- The occupancy of pair background with various range cut were checked.
  - —Noise rate : 50 electrons /pixel
  - —Threshold : 200 electrons /pixel
  - —Digitized into 7bits, bin width : 25 electrons

The occupancy of pair background for 1 train			
Range cut	layer1a	layer1b	Data statistics
100um	2.76 %	1.55 %	800BX
10um	3.6 %	2.0 %	100BX
1um	6.1 %	3.6 %	100BX

- The occupancy was increased at shorter range cut value.
- The range cut value is effective on pair background event.

Summary/Plan

Summary

- The digitization of energy deposit was implemented in FPCCD clustering processor.
  - The position resolution were worse 1 ~ 5 % at digitized.
- The occupancy of pair background with various range cut.

Range cut	layer1a	layer1b
10um	3.6 %	2.0 %
1um	6.1 %	3.6 %

—The range cut value is effective on pair background event.

Plan

- γγ → hadron study is continued.
- The random noise will be implemented.
- Background rejection algorithm will be developed.