

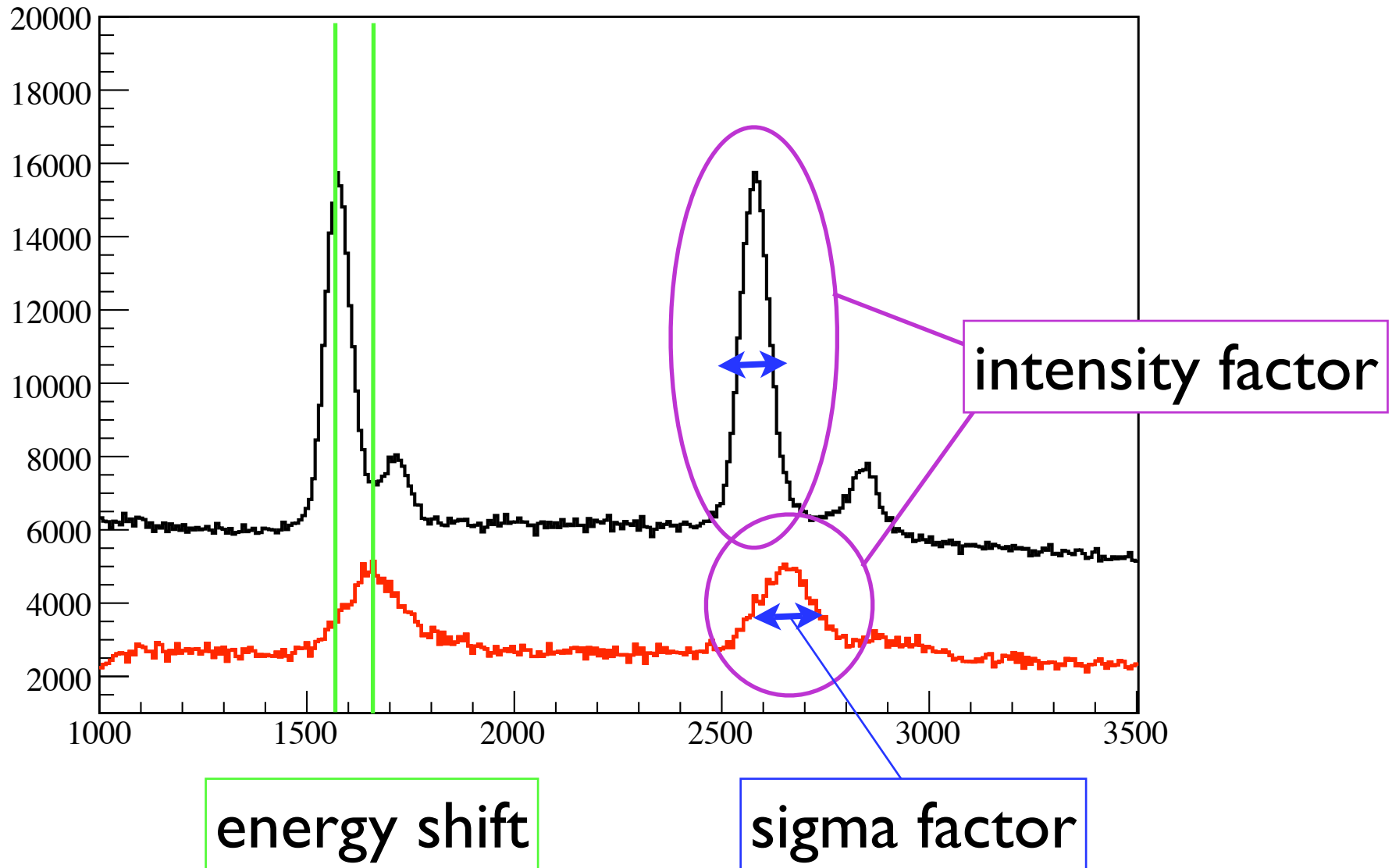
27 March 2007 Hideyuki Tatsuno

Pileup fitting

—systematics error estimation—

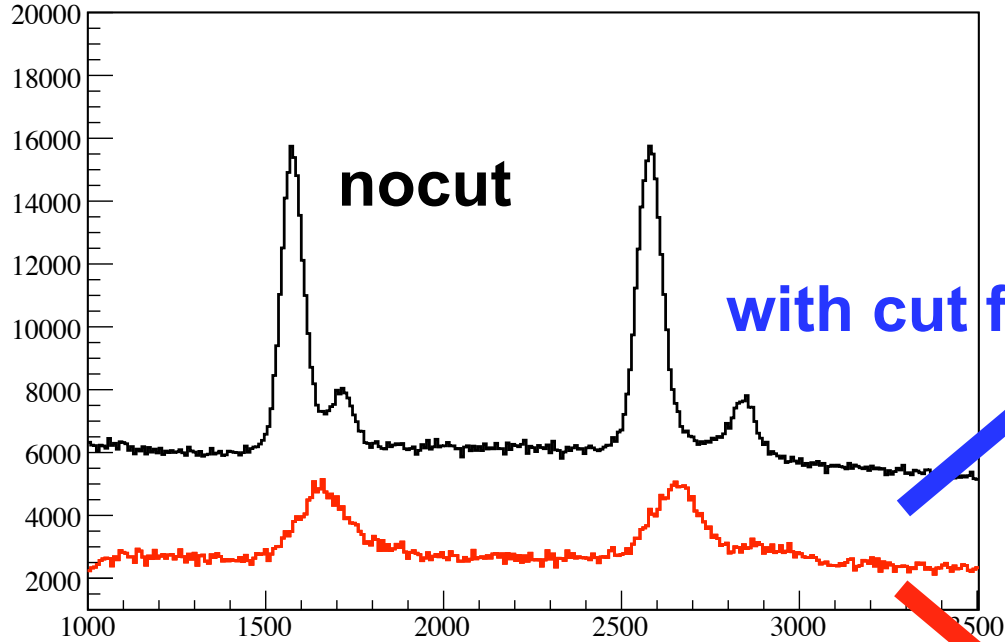
We want to know

SDD No.5 black:nocut (red:pileup)



Fitting

SDD No.5 black:nocut (red:pileup)

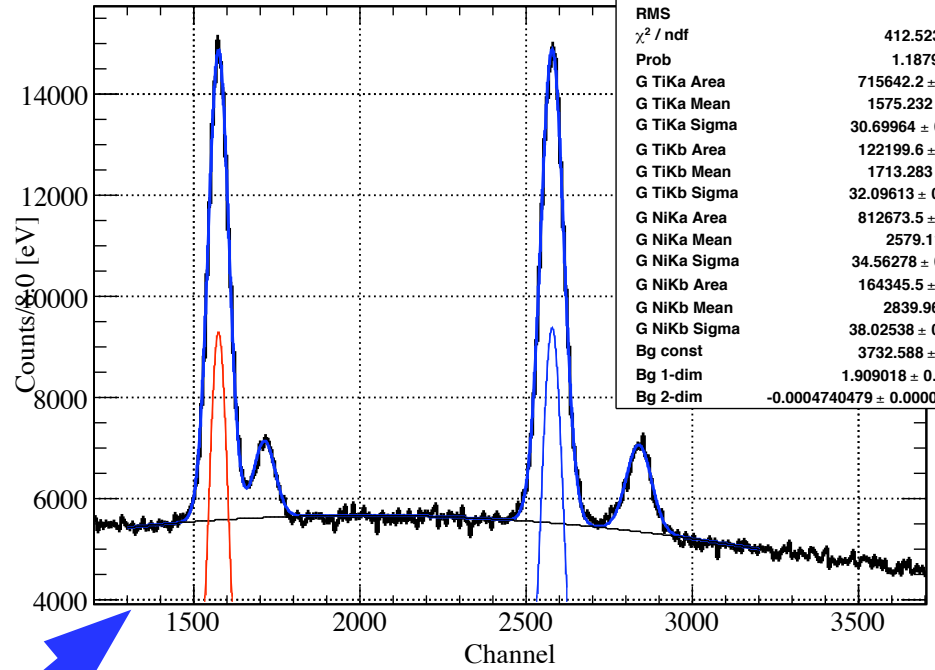


×5 pileup

pileup fit

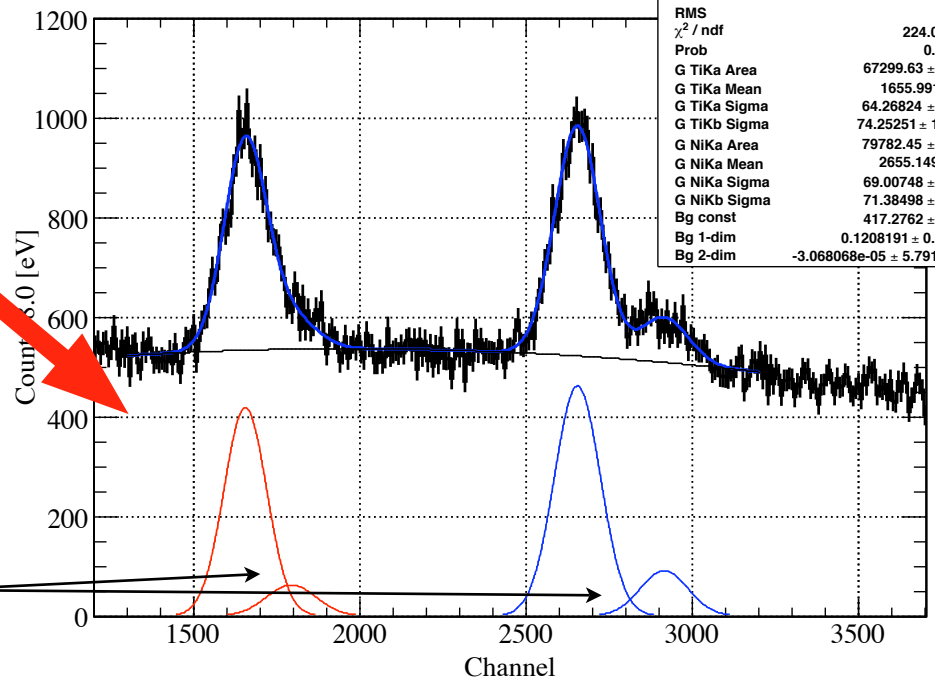
Distance between $K\alpha$ and $K\beta$ positions were fixed

fadc cut cycle1 sdd5



hene	
Entries	2310817
Mean	2384
RMS	696.6
χ^2 / ndf	412.5237 / 223
Prob	1.187939e-14
G TiKa Area	715642.2 ± 4046.4
G TiKa Mean	1575.232 ± 0.186
G TiKa Sigma	30.69964 ± 0.18651
G TiKb Area	122199.6 ± 3340.0
G TiKb Mean	1713.283 ± 0.940
G TiKb Sigma	32.09613 ± 0.98698
G NiKa Area	812673.5 ± 4177.6
G NiKa Mean	2579.11 ± 0.19
G NiKa Sigma	34.56278 ± 0.18801
G NiKb Area	164345.5 ± 3801.2
G NiKb Mean	2839.96 ± 0.87
G NiKb Sigma	38.02538 ± 0.99507
Bg const	3732.588 ± 94.450
Bg 1-dim	1.909018 ± 0.085669
Bg 2-dim	-0.0004740479 ± 0.0000186221

fadc diff cycle1 sdd5



hene	
Entries	220703
Mean	2398
RMS	696.2
χ^2 / ndf	224.063 / 227
Prob	0.5426488
G TiKa Area	67299.63 ± 1673.88
G TiKa Mean	1655.991 ± 1.784
G TiKa Sigma	64.26824 ± 2.03005
G TiKb Area	74.25251 ± 10.49915
G NiKa Area	79782.45 ± 1810.58
G NiKa Mean	2655.149 ± 1.568
G NiKa Sigma	69.00748 ± 1.60443
G NiKb Area	71.38498 ± 4.98514
G NiKb Sigma	417.2762 ± 29.5152
Bg const	0.1208191 ± 0.0267118
Bg 1-dim	-3.068068e-05 ± 5.791055e-06
Bg 2-dim	

Results

SDD-by-SDD

SDD2

pileup ratio

Ti : 0.0600437 +- 0.00186152

Ni : 0.0591151 +- 0.00226488

pileup shift

Ti : 50.7044 +- 2.12396 ch

Ni : 54.4967 +- 2.54789 ch

pileup sigma factor

Ti : 2.44314 +- 0.0790862

Ni : 2.29951 +- 0.089012

SDD5

pileup ratio

Ti : 0.0940409 +- 0.00239866

Ni : 0.0981728 +- 0.00228437

pileup shift

Ti : 80.7594 +- 1.79374 ch

Ni : 76.0396 +- 1.57945 ch

pileup sigma factor

Ti : 2.09345 +- 0.0673382

Ni : 1.99658 +- 0.0476742

SDD4

pileup ratio

Ti : 0.0738164 +- 0.00188199

Ni : 0.0678744 +- 0.00218771

pileup shift

Ti : 72.9659 +- 1.58374 ch

Ni : 74.0153 +- 2.0235 ch

pileup sigma factor

Ti : 2.06538 +- 0.0579406

Ni : 2.15888 +- 0.0740092

**Energy shift
difference exists!**

not yet considered

Sigma factor is ~ 2

consistent

**SDD2 : ~1% larger than
the phenomenological
fitting**

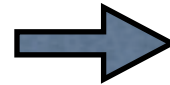
**SDD4, SDD5 : ~1%
smaller than the
phenomenological
fitting**

Total (SDD2, 4 and 5)

pileup ratio

Ti : 0.0781164 +- 0.00129963

Ni : 0.0789374 +- 0.00136381

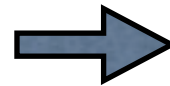


~ 7.8 %

pileup shift

Ti : 73.5321 +- 1.21258 ch

Ni : 77.0461 +- 1.27397 ch

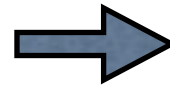


~ 200 eV

pileup sigma factor

Ti : 2.21706 +- 0.0476156

Ni : 1.94194 +- 0.0337084



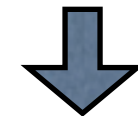
~ 2

Final fit (phenomenological)

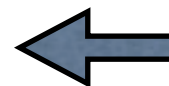
20	Pile area factor	1.07228e-01	fixed
21	Pile shift [eV]	2.00000e+02	fixed
22	Pile sigma factor	2.00000e+00	fixed

~ 10.7 %

← 3% Larger !



re-calibrate (iterative) ...



influences $\sim \pm 1$ eV

NEXT

- ▶ We have to check the kaon-trigger events
- ▶ Estimate the systematics error after iterative calibration,
- ▶ How do we check the pileup at the second cycle ?

Thanks to the lower π/K ratio, it is sure that the pileup ratio (pileup/main Gauss) is smaller than that of first cycle.