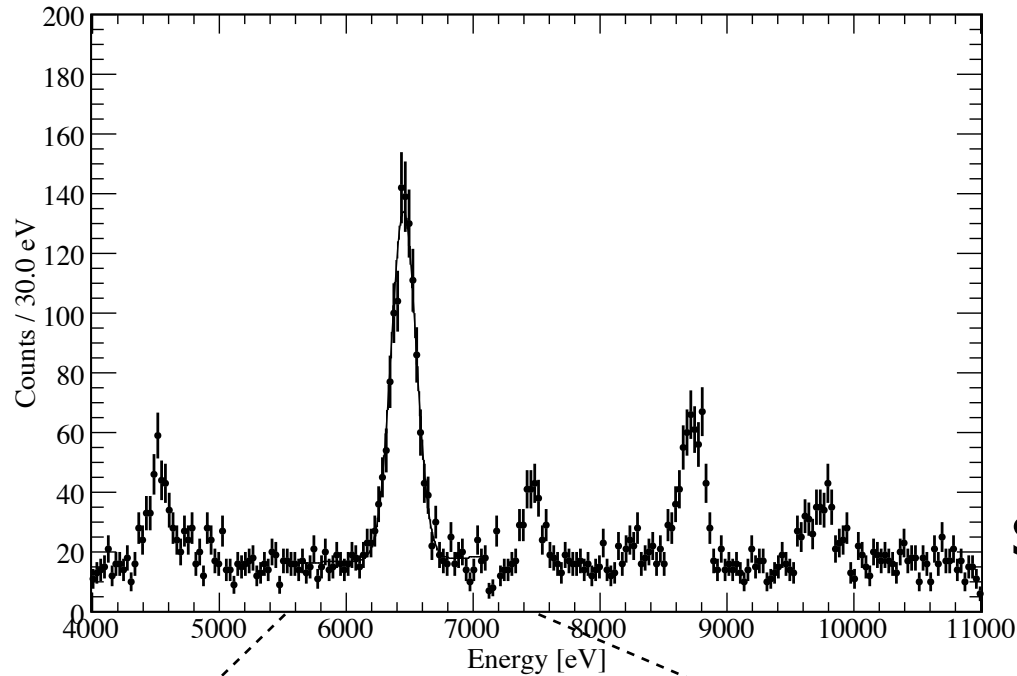


Width check

Comparison the width of K-He $L\alpha$ peak
with that of calibration peaks (Ti and Ni)

An indication of finite natural-line width Γ_{2p}

1st cycle with fiducial-volume cuts

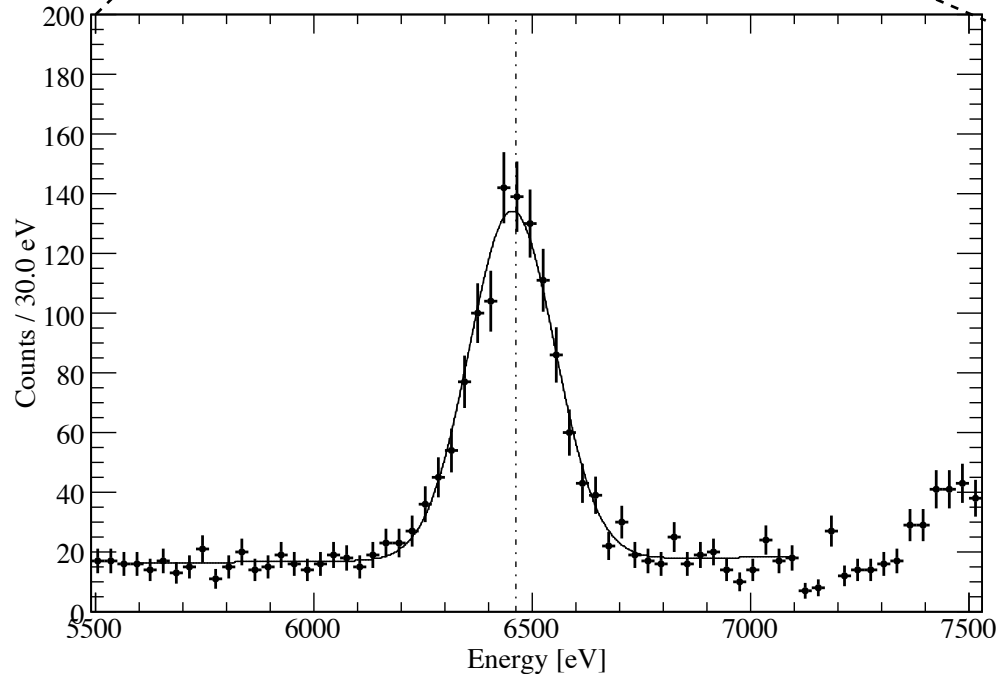


KHeX L α peak

Local fit

single Gaussian + linear BG

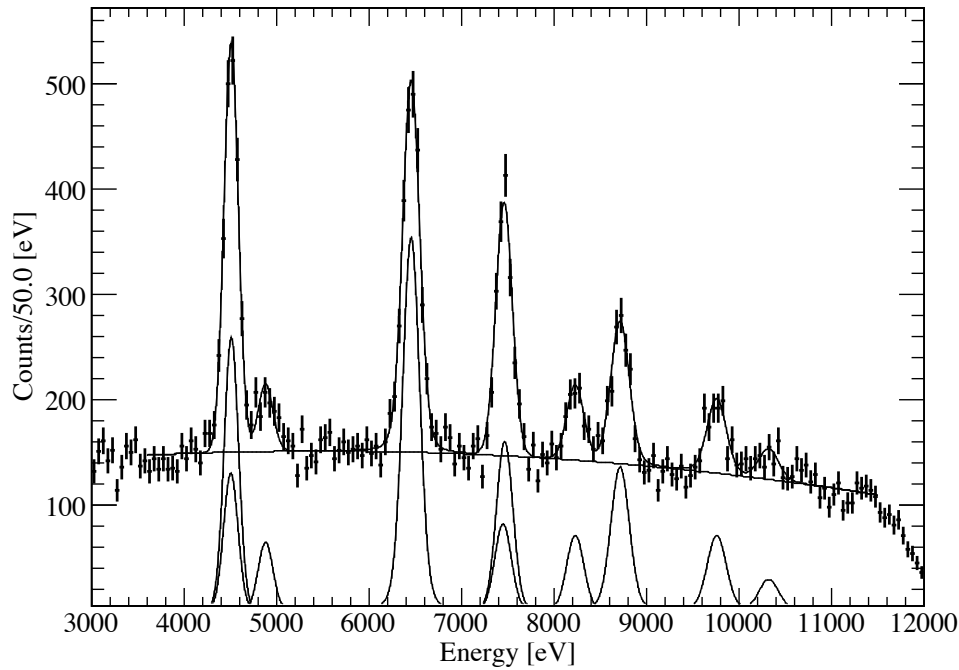
1st cycle with fiducial-volume cuts



mean = 6454.6 ± 4.2 eV
sigma = 98.2 ± 4.1 eV

1st cycle E549 trig. global

2



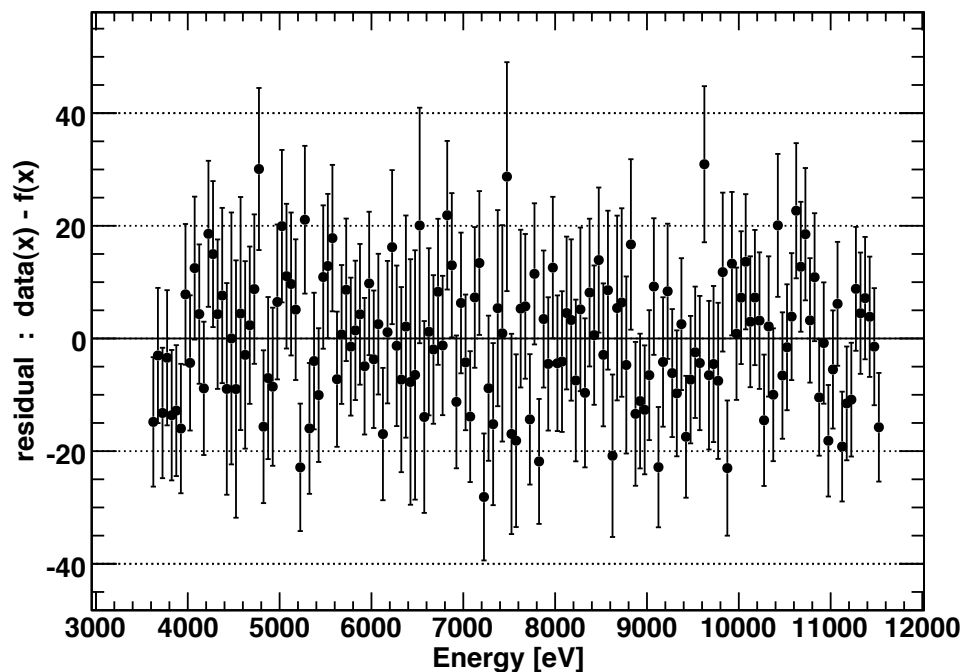
Without fiducial-volume cuts

Global fit

Gaussians + Voigtians
+ quadratic BG

shift = -6.2 ± 2.7 eV

Gamma = 28 ± 11 eV



Resolution function

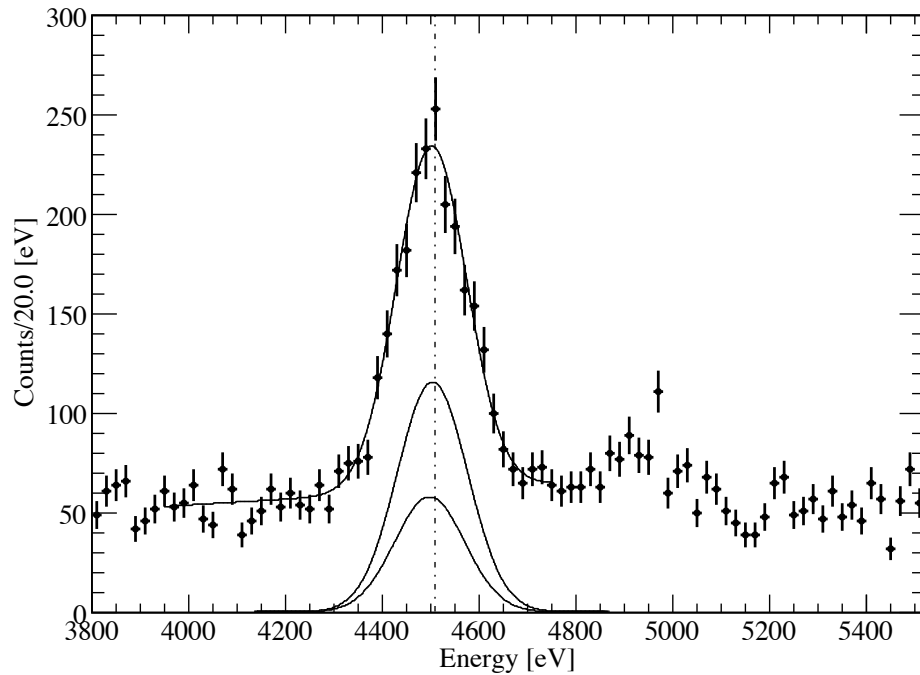
$$\sigma = \sqrt{N^2 + FwE}$$

determined by self-trigger data

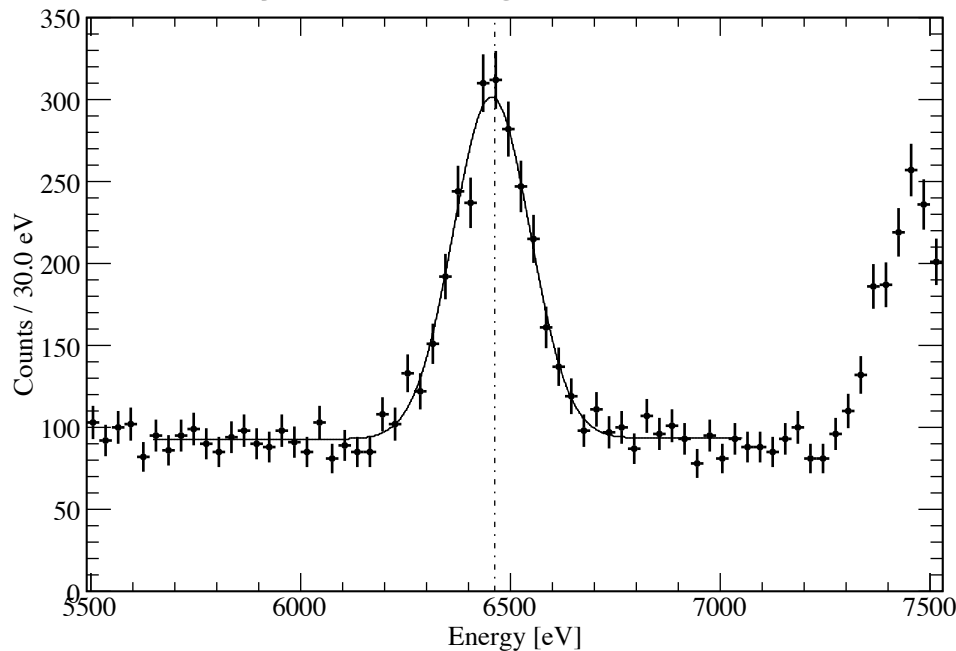
3

Without fiducial-volume cuts
Local fit
Gaussian + linear BG

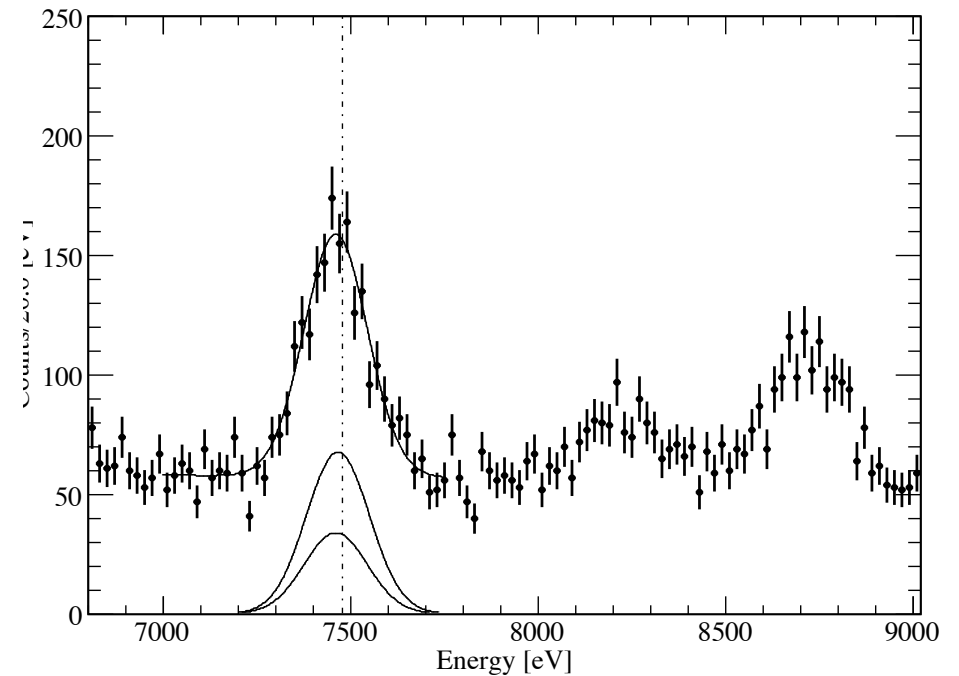
2nd cycle E549 trig. Ti local



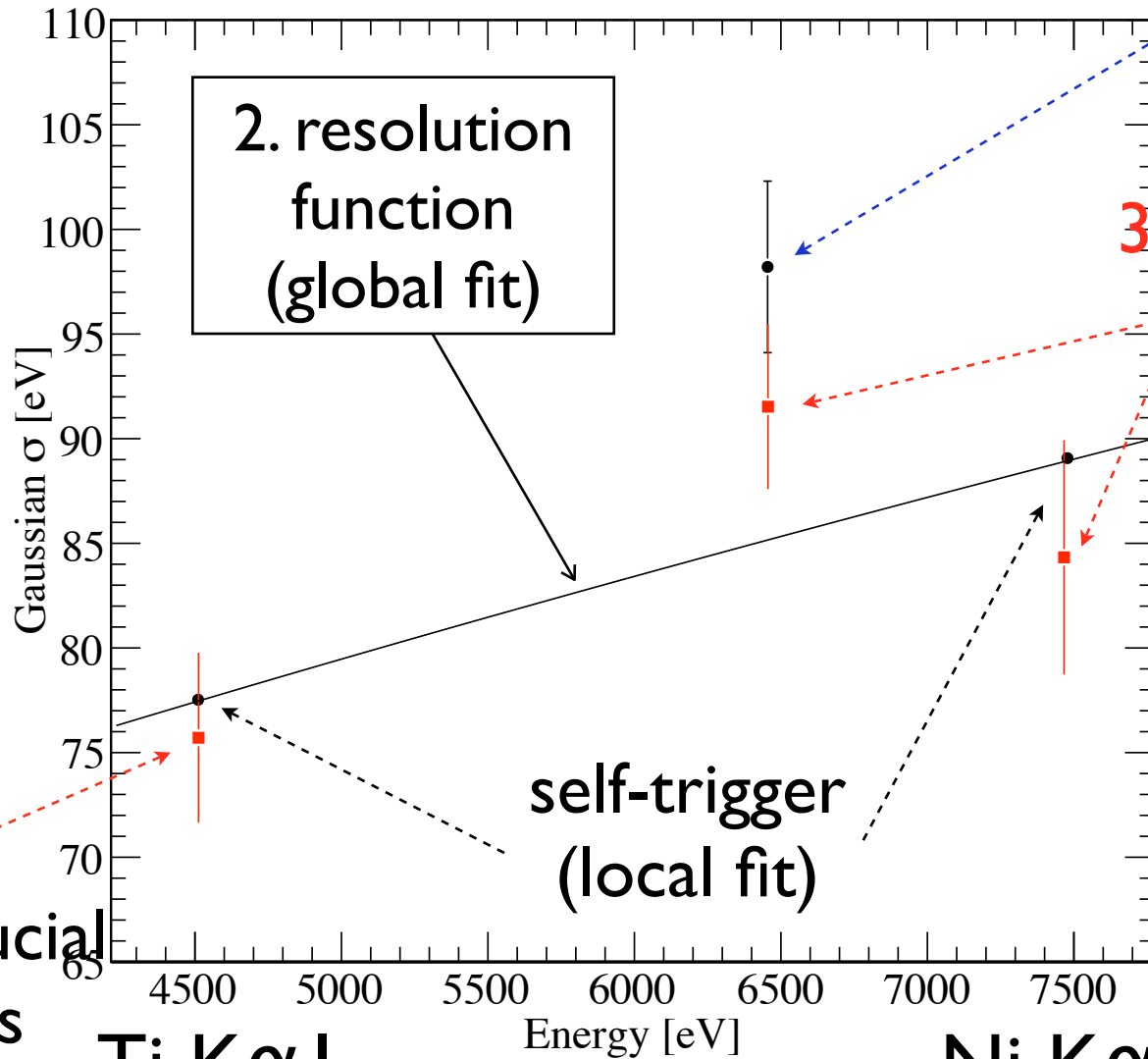
1st cycle E549 trig. KHeX La local



1st cycle E549 trig. Ni local



1st cycle σ and resolution func.



1. with fiducial volume cuts (local fit)

3. without fiducial volume cuts (local fit)

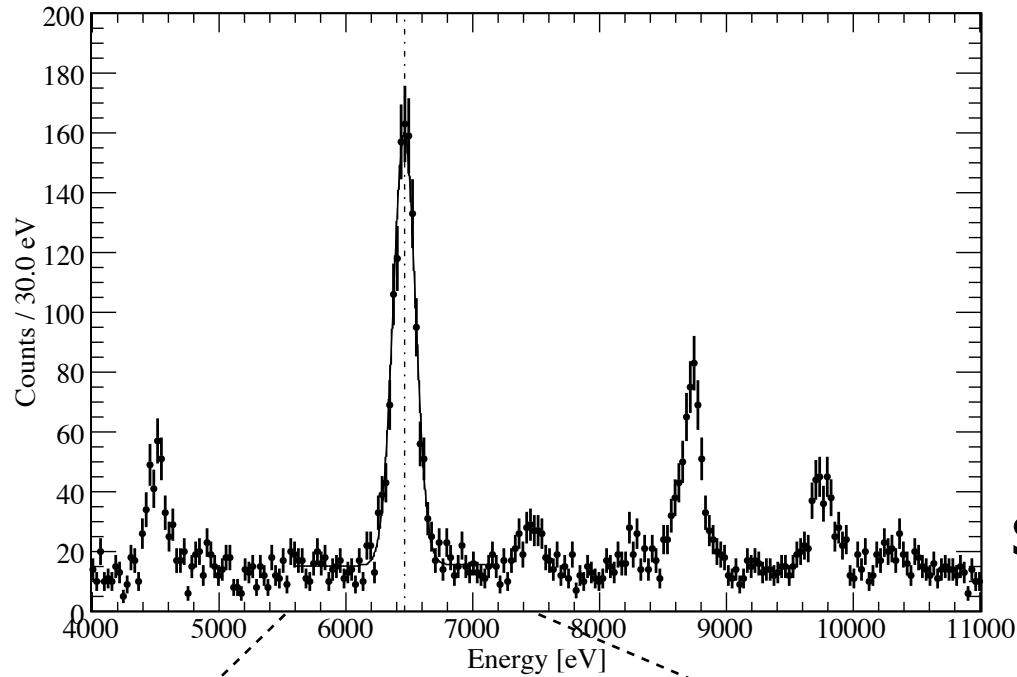
3. without fiducial volume cuts (local fit)

Ti $K\alpha I$

Ni $K\alpha I$

KHeX $L\alpha I$

2nd cycle with fiducial-volume cuts

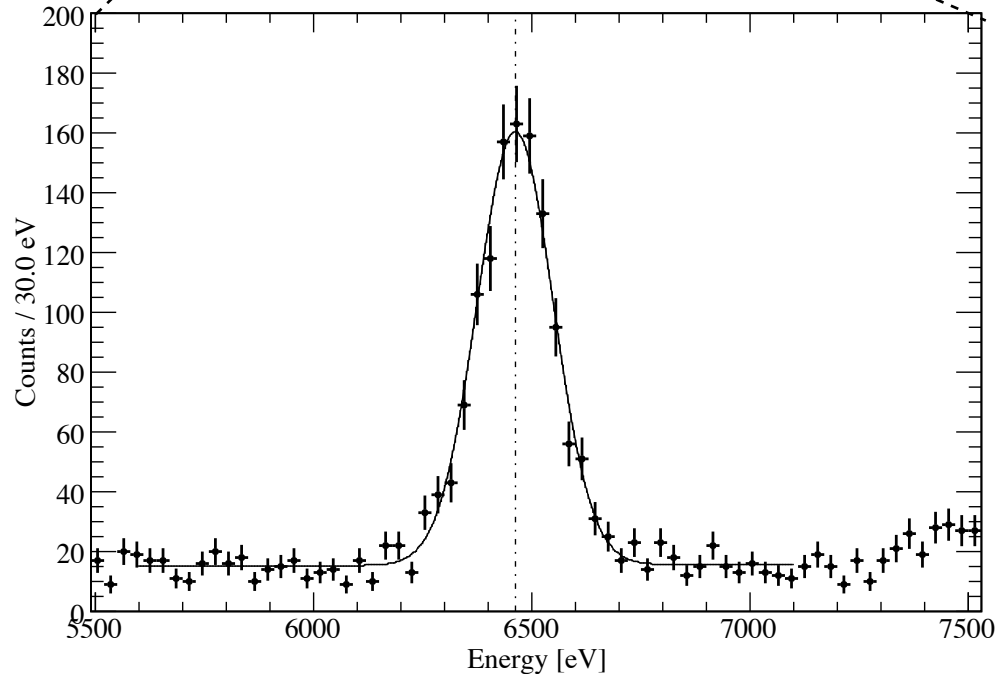


KHeX L α peak

Local fit

single Gaussian + linear BG

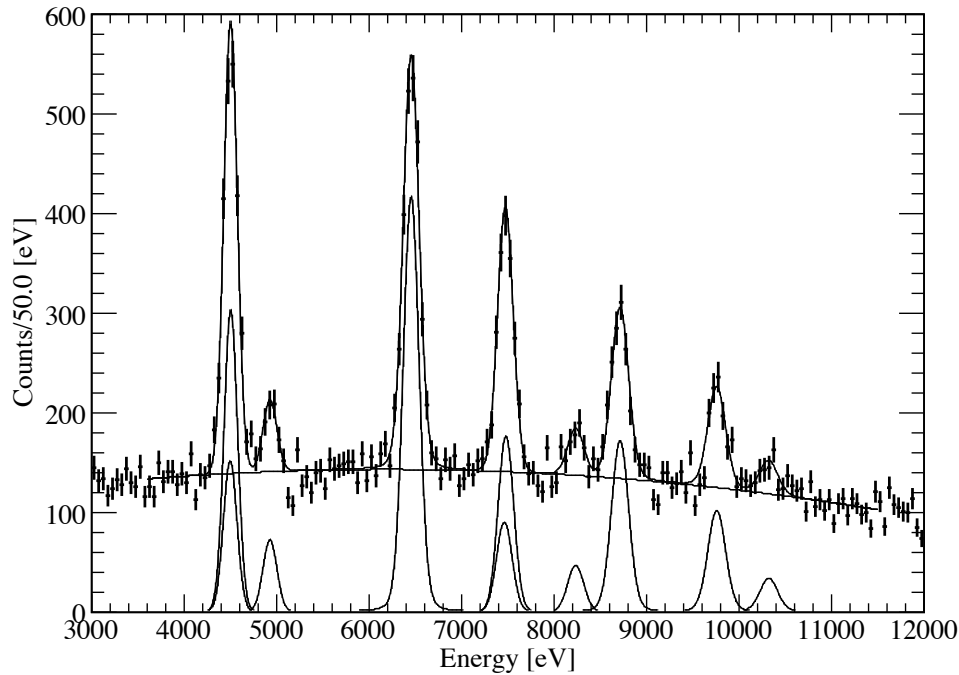
2nd cycle with fiducial-volume cuts



mean = 6462.5 ± 3.4 eV
sigma = 87.1 ± 3.2 eV

2nd cycle E549 trig. global

2



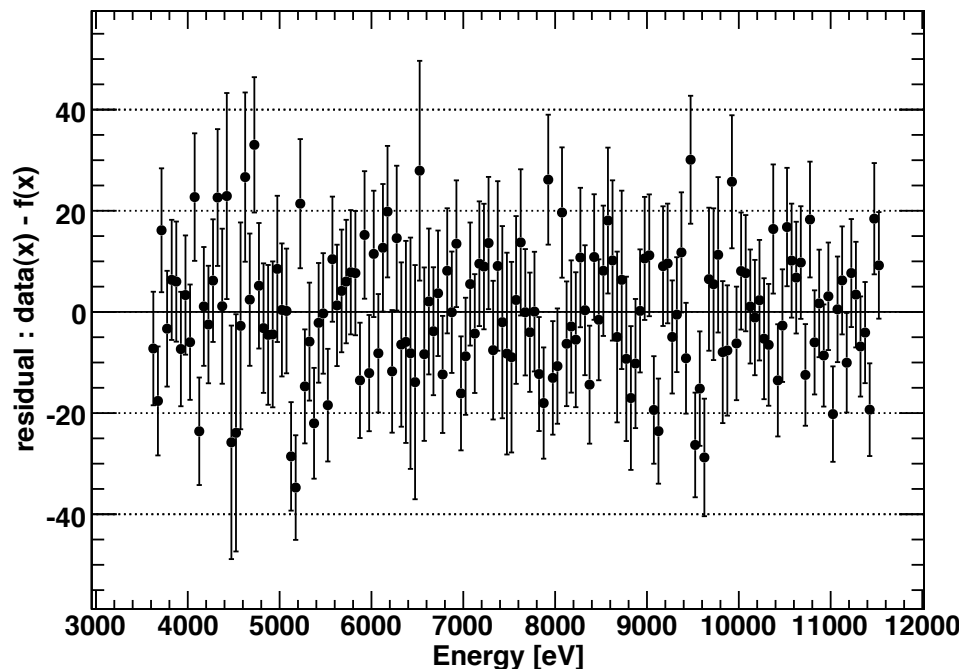
Without fiducial-volume cuts

Global fit

Gaussians + Voigtians
+ quadratic BG

shift = -6.2 ± 2.7 eV

Gamma = 20 ± 9 eV



Resolution function

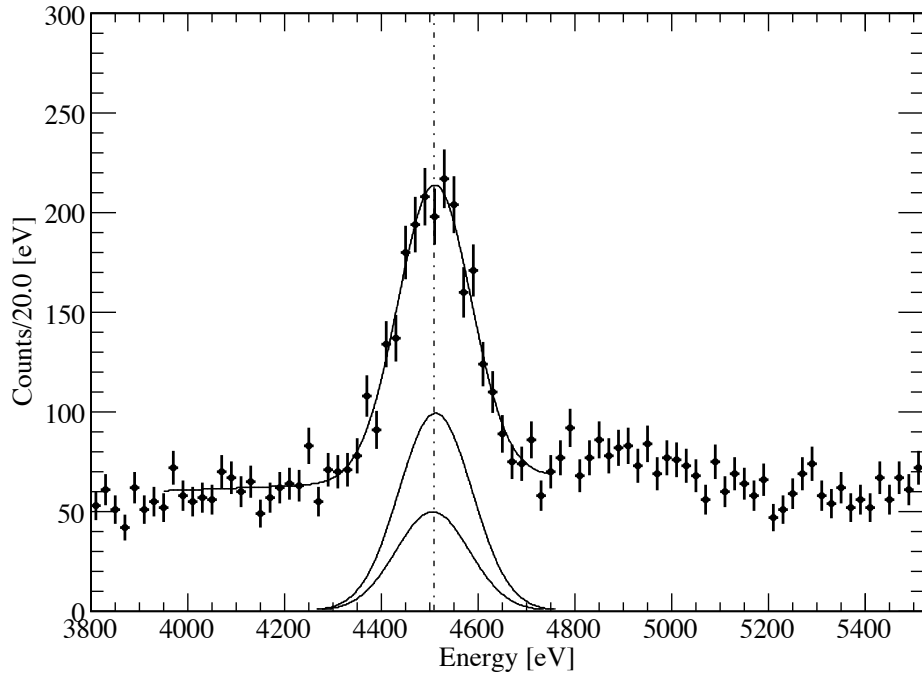
$$\sigma = \sqrt{N^2 + FwE}$$

determined by self-trigger data

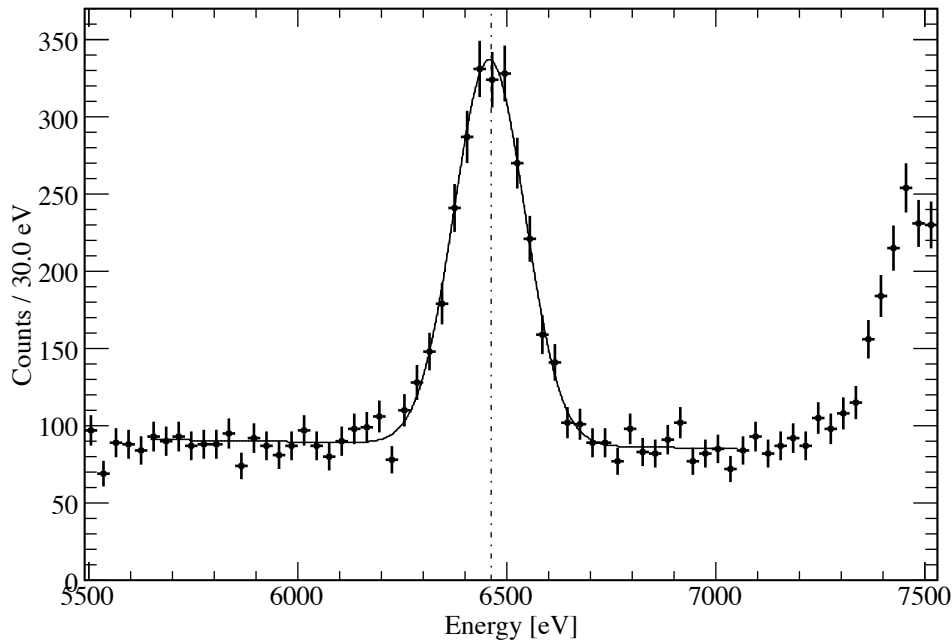
3

Without fiducial-volume cuts
Local fit
Gaussian + linear BG

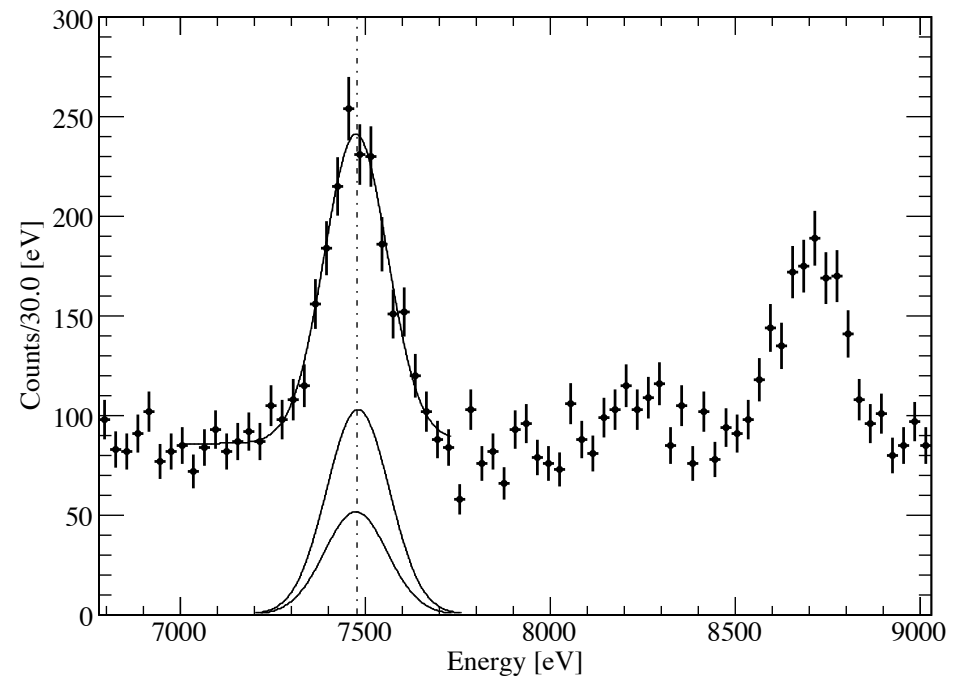
1st cycle E549 trig. Ti local



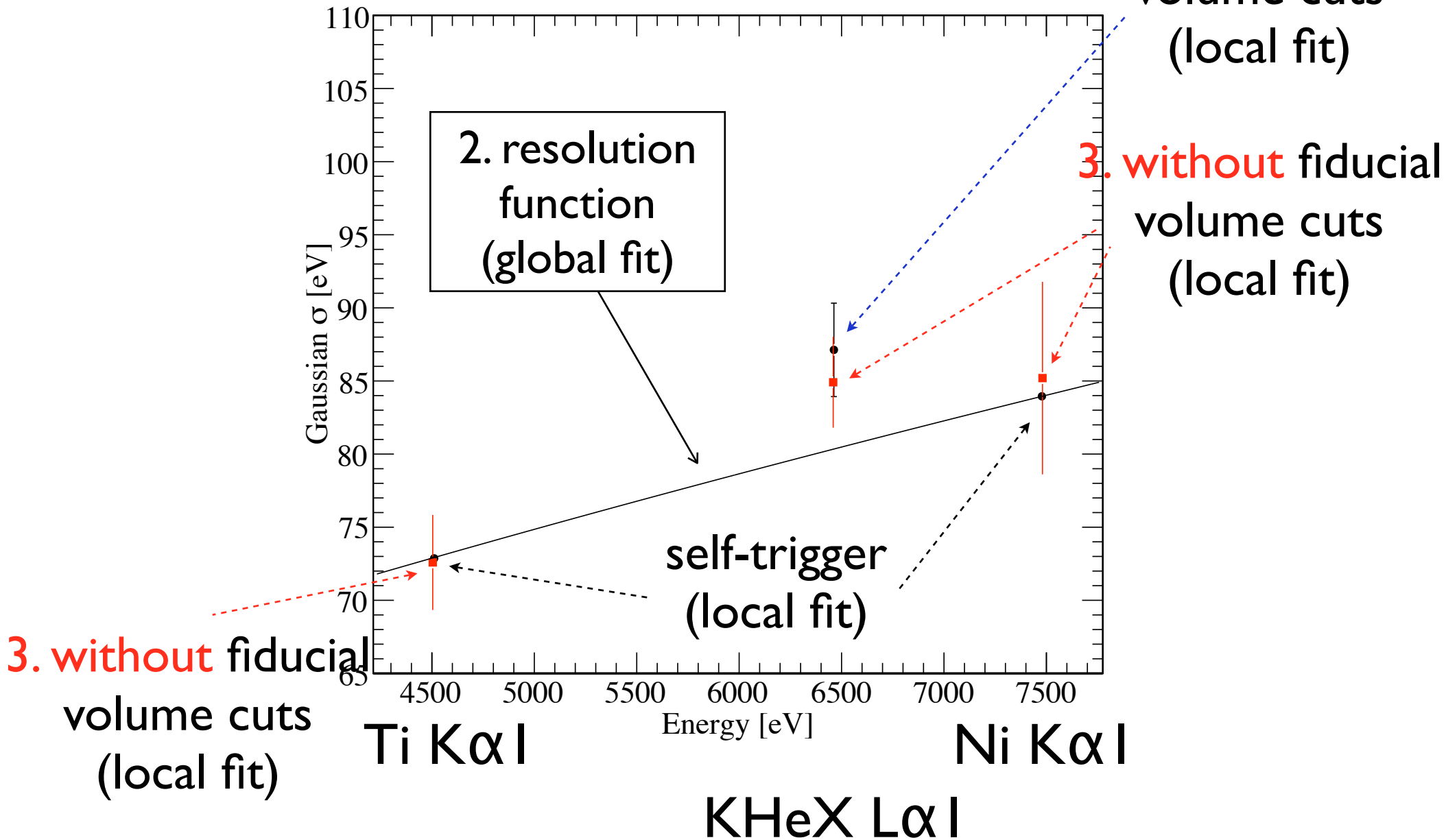
2nd cycle E549 trig. KHeX La local



2nd cycle E549 trig. Ni local

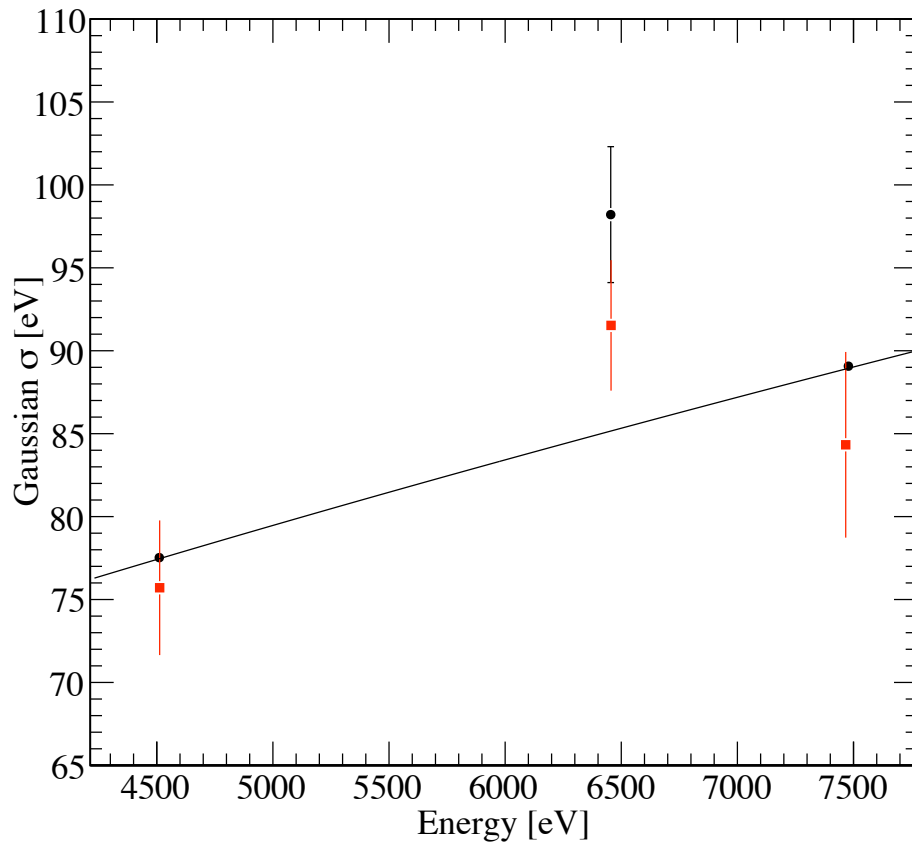


2nd cycle σ and resolution func.

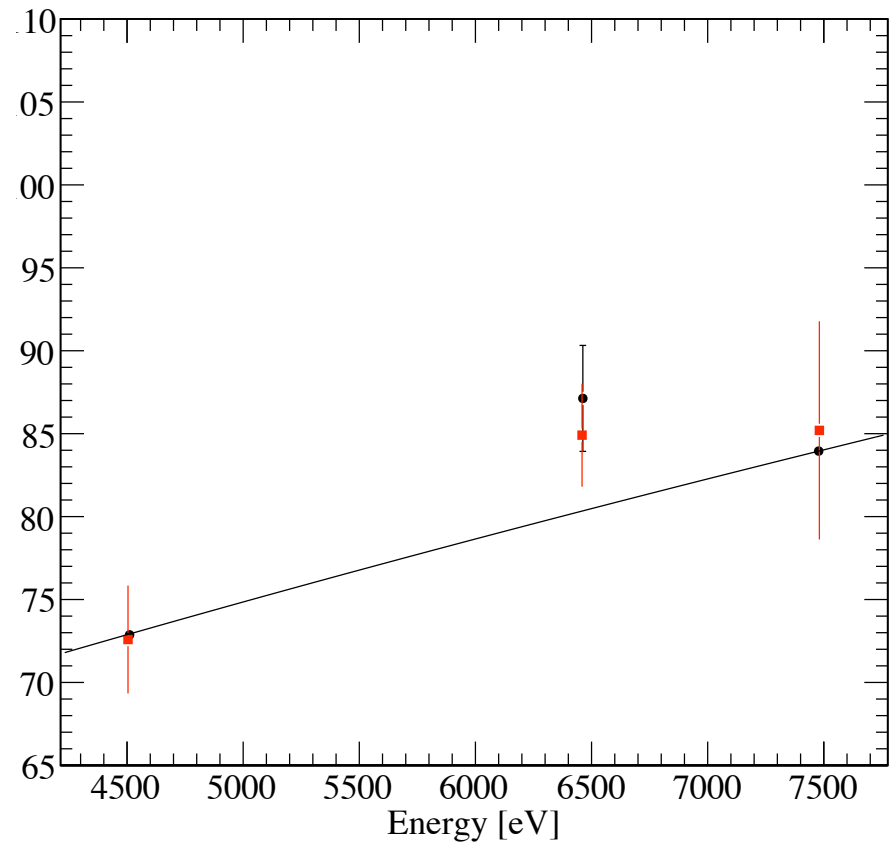


Summary

1st cycle σ and resolution func.



2nd cycle σ and resolution func.

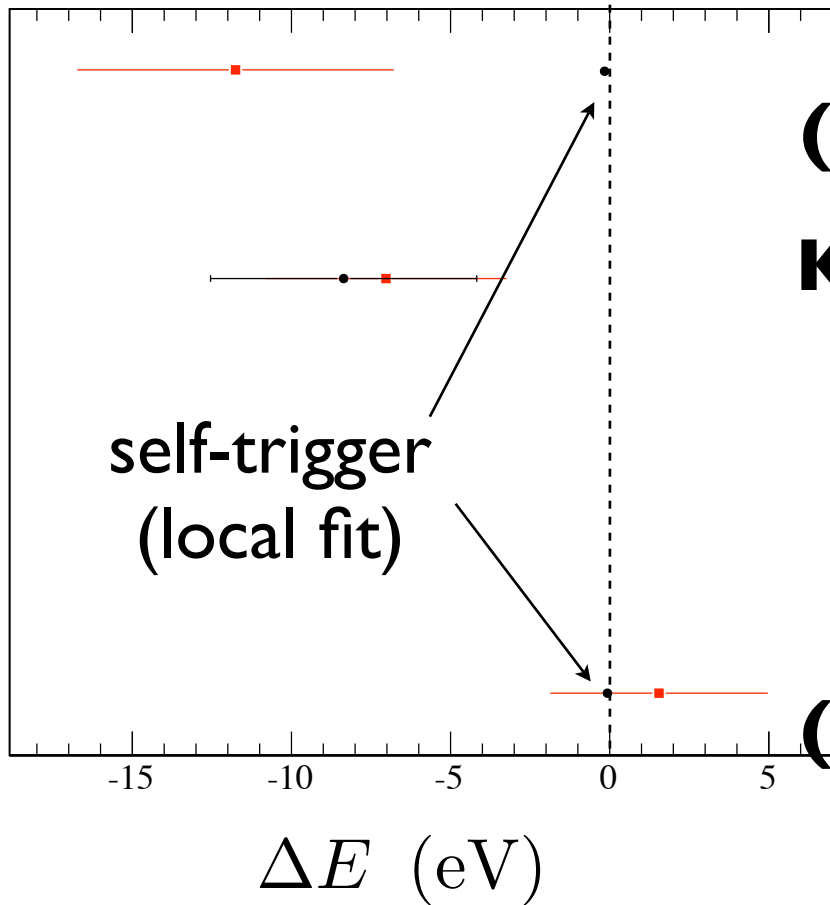


The K-He $L\alpha$ peak is *wider* than the calibration peaks (SDD-resolution func.)

→ indication of finite natural-line width Γ_{2p}

How about Gaussian means (local-fits) ?

1st cycle
Gaussian means



Ni K α I
(7478.15)

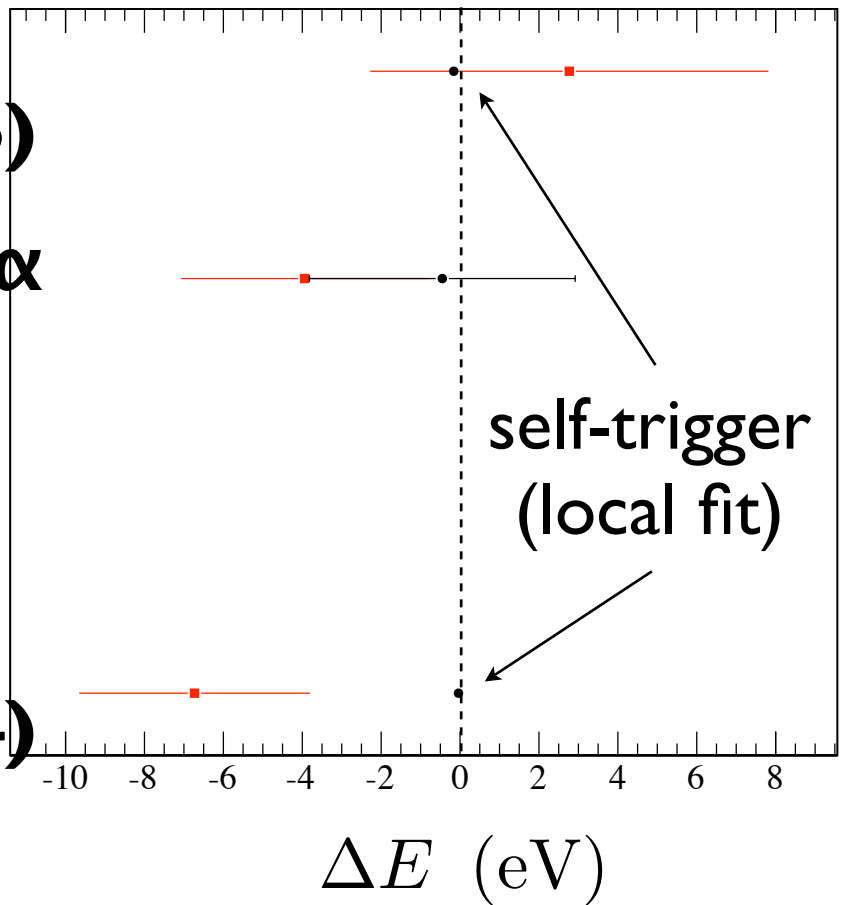
KHeX L α
(6463)

Ti K α I
(4510.84)

self-trigger
(local fit)

ΔE (eV)

2nd cycle
Gaussian means

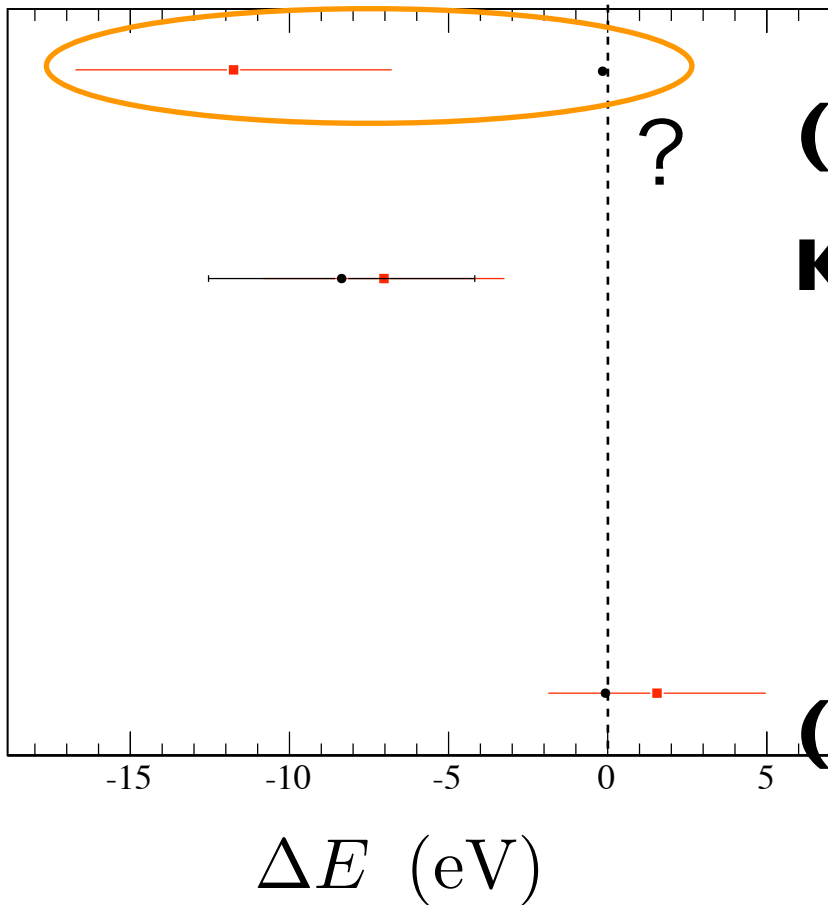


self-trigger
(local fit)

ΔE (eV)

E549 trig. without fiducial-volume cuts

1st cycle
Gaussian means



2nd cycle
Gaussian means

