E570 meeting report 19/May/2006 H. Tatsuno

An application of the Voigtian response function to E570 real data with a regard to Kβ' satellites

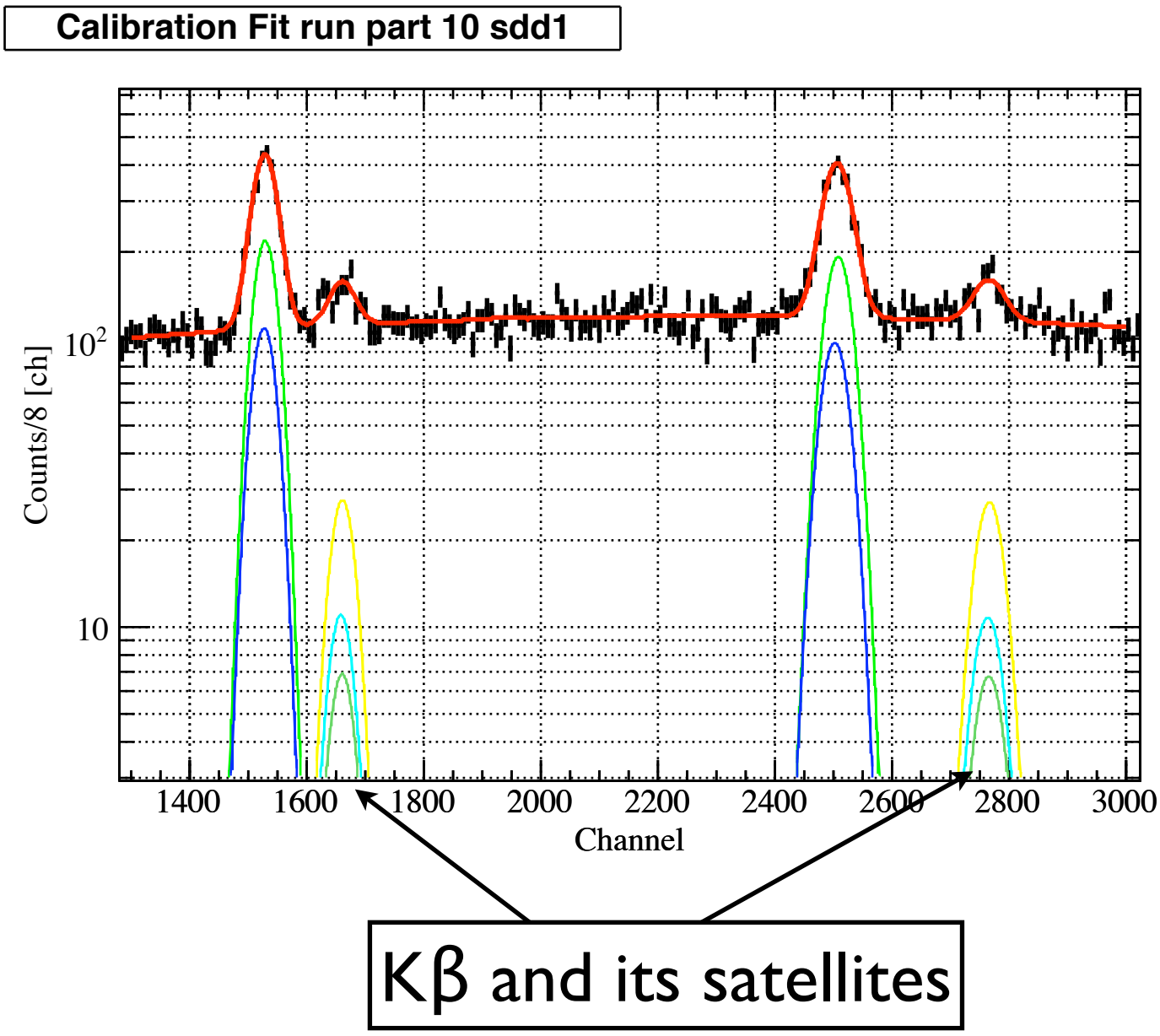
data set : E570 second cycle, run 466 - 468

only sdd1, with self trigger not k-stop cut, fout correlation cut and upper rate < 1kHz.

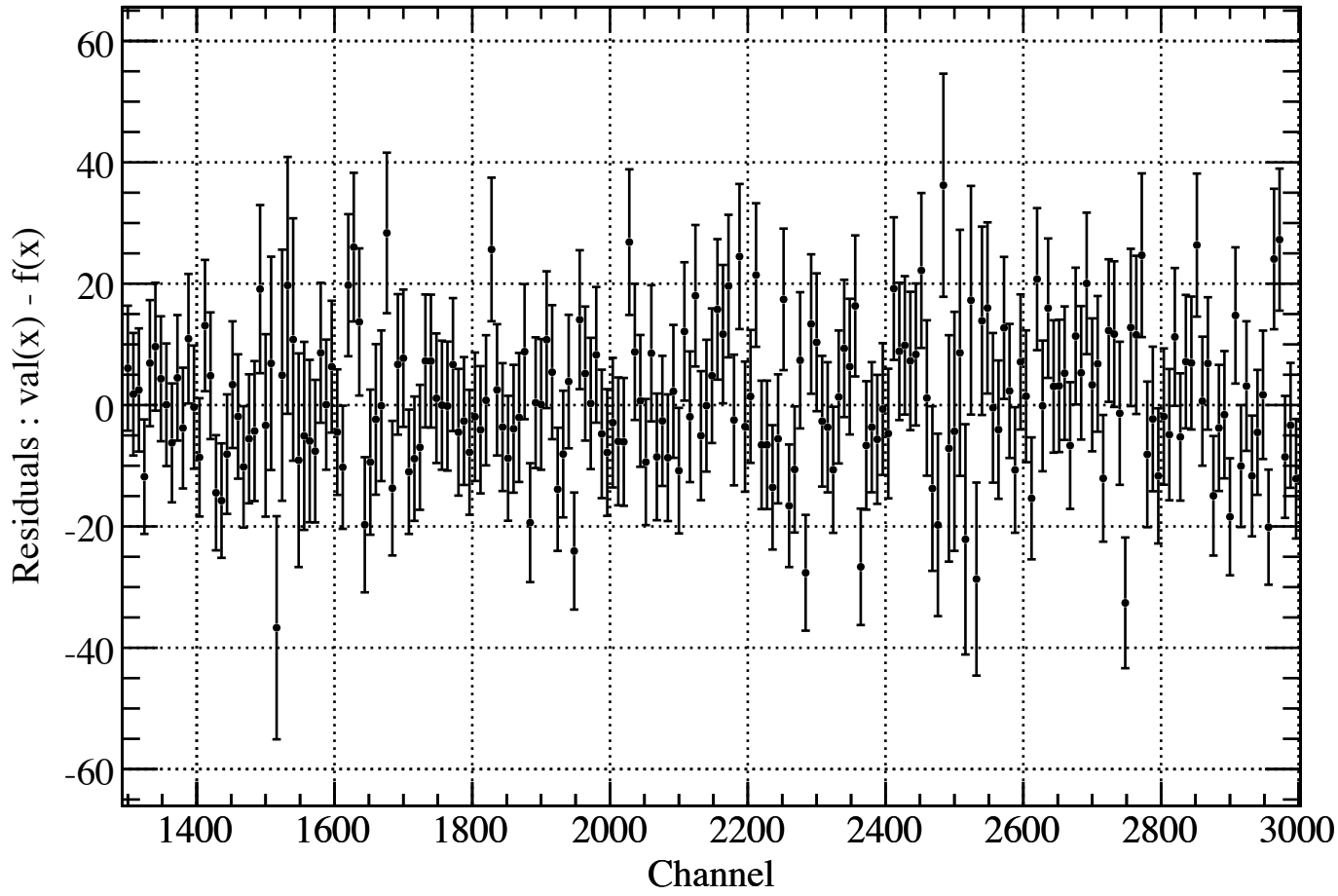
There are many assumptions for Kβ' satellites: intensity ratio, natural width, and energies.

Ti and Ni Kβ centroids are fitted using new response function with Kβ satellites, and the systematic shifts are reproduced.

Voigtian fit with lower-side tail and some satellites



Residuals of Fit



Fit result

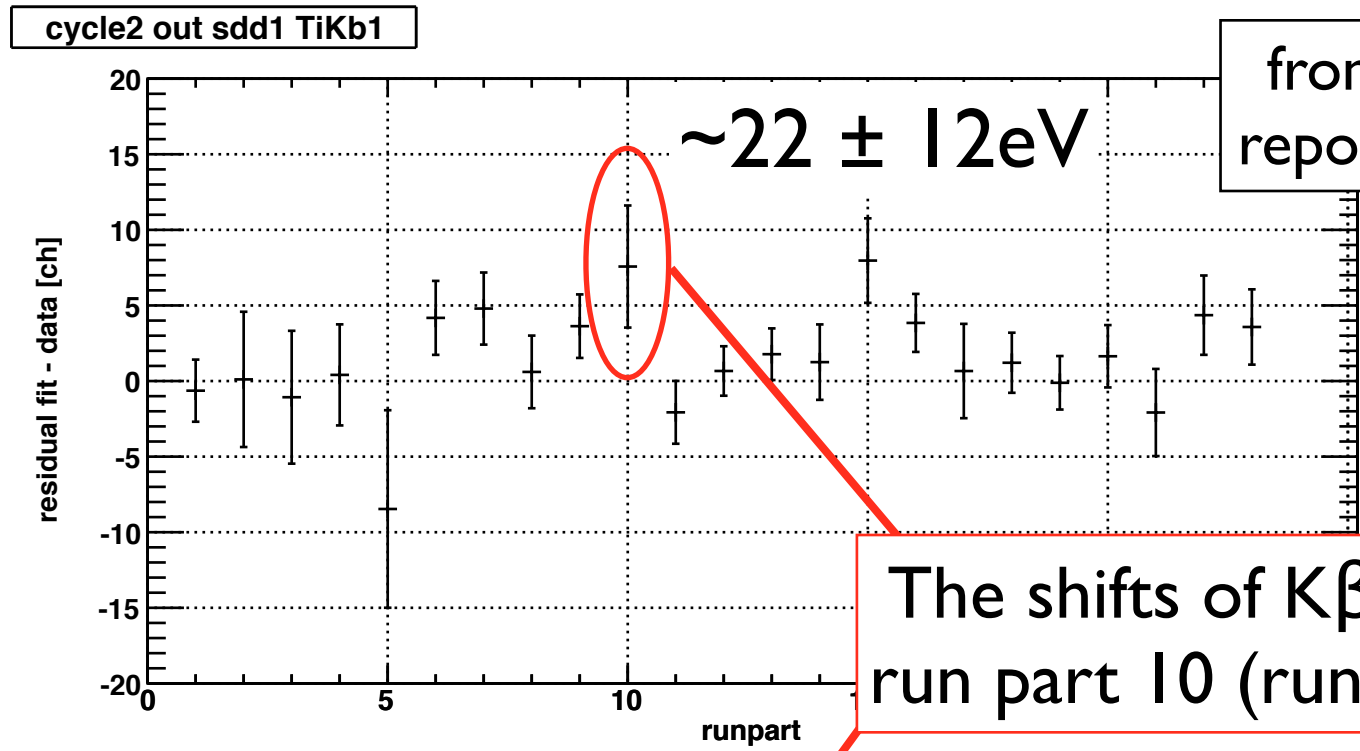
calibrated by Ti Kα1 and Ni Kα1 peaks, the energies of the X-rays are referenced from X-rays Data Booklet

ndf = 197
chi^2 = 225.378
chi^2/ndf = 1.14405
e2c = 3.03077 +- 0.00332793 [eV/ch]
intercept = -124.69 +- 5.48223 [eV]
Ti Kb1 mean = 4911 +- 12.2134 [eV]
Ni Kb1 mean = 8260.88 +- 11.9069 [eV]

the difference of K beta mean (fit - ref)
diff Ti Kb1 mean = -20.8113 +- 12.2134 [eV]
diff Ni Kb1 mean = -3.78307 +- 11.9069 [eV]

The shifts of Kβ centroids : fit value − reference

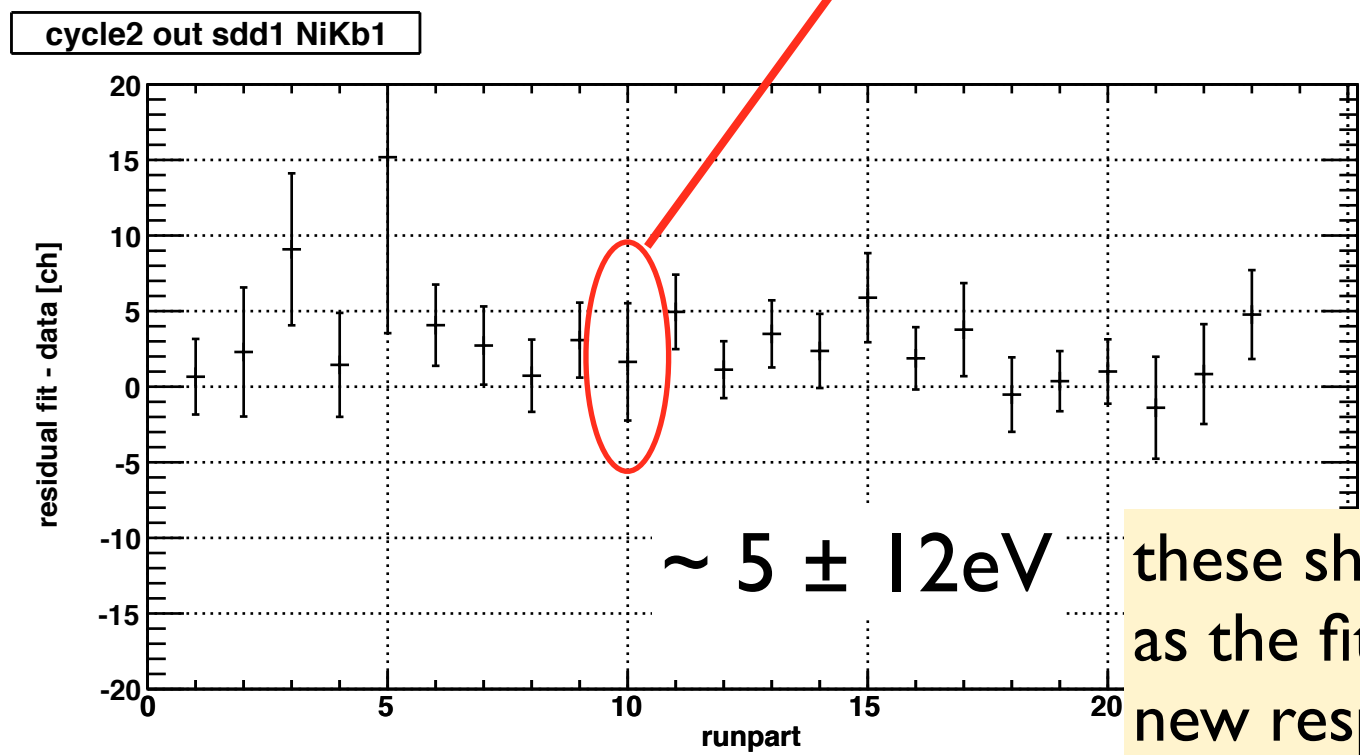
⇨ compared with the previous fit values (25/Apr/2006 report)



from 25/Apr/2006
report by H.Tatsuno

Δ ch

The shifts of Kβ centroids
run part 10 (run 466 - 468)



Δ ch

these shifts are same
as the fit values of
new response function

Summary

The response function using Voigtian + lower-side tail + some satellites can be applied to the calibration of E570 data. (But it takes long time to converge and the convergence is unstable.)

Even so, the shits of Kβ centroids still exist.

Now our state is ....

Kβ line has a systematic shift relative to Kα line, which cannot be explained by satellites.

There is no way to know the absolute shifts of Kβ and Kα ionized by fast pions.