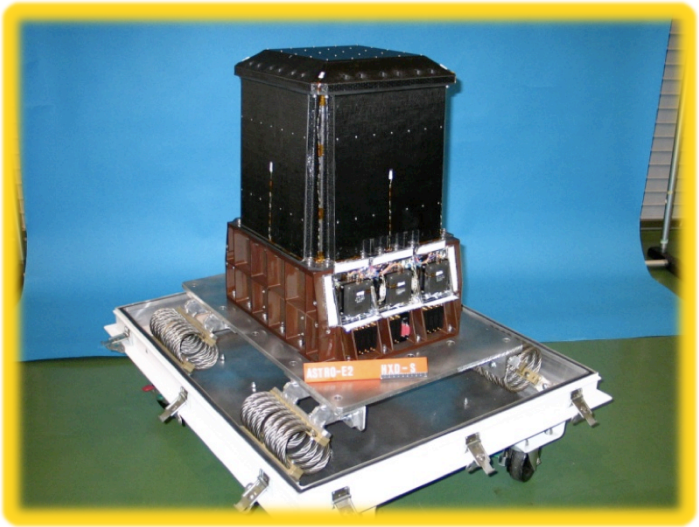
Calibration Status
Suzaku Hard X-ray Detector



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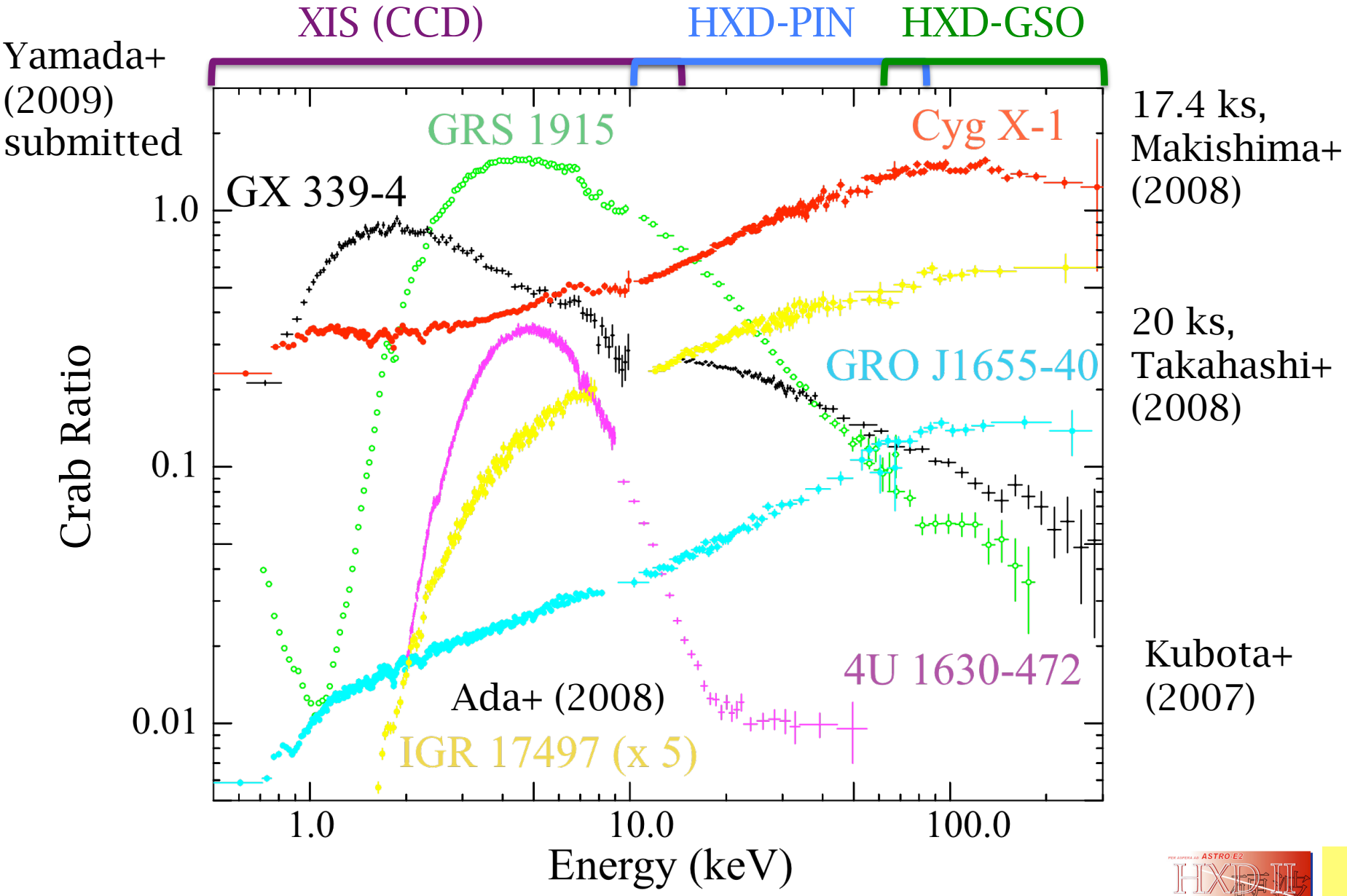
The University of Tokyo

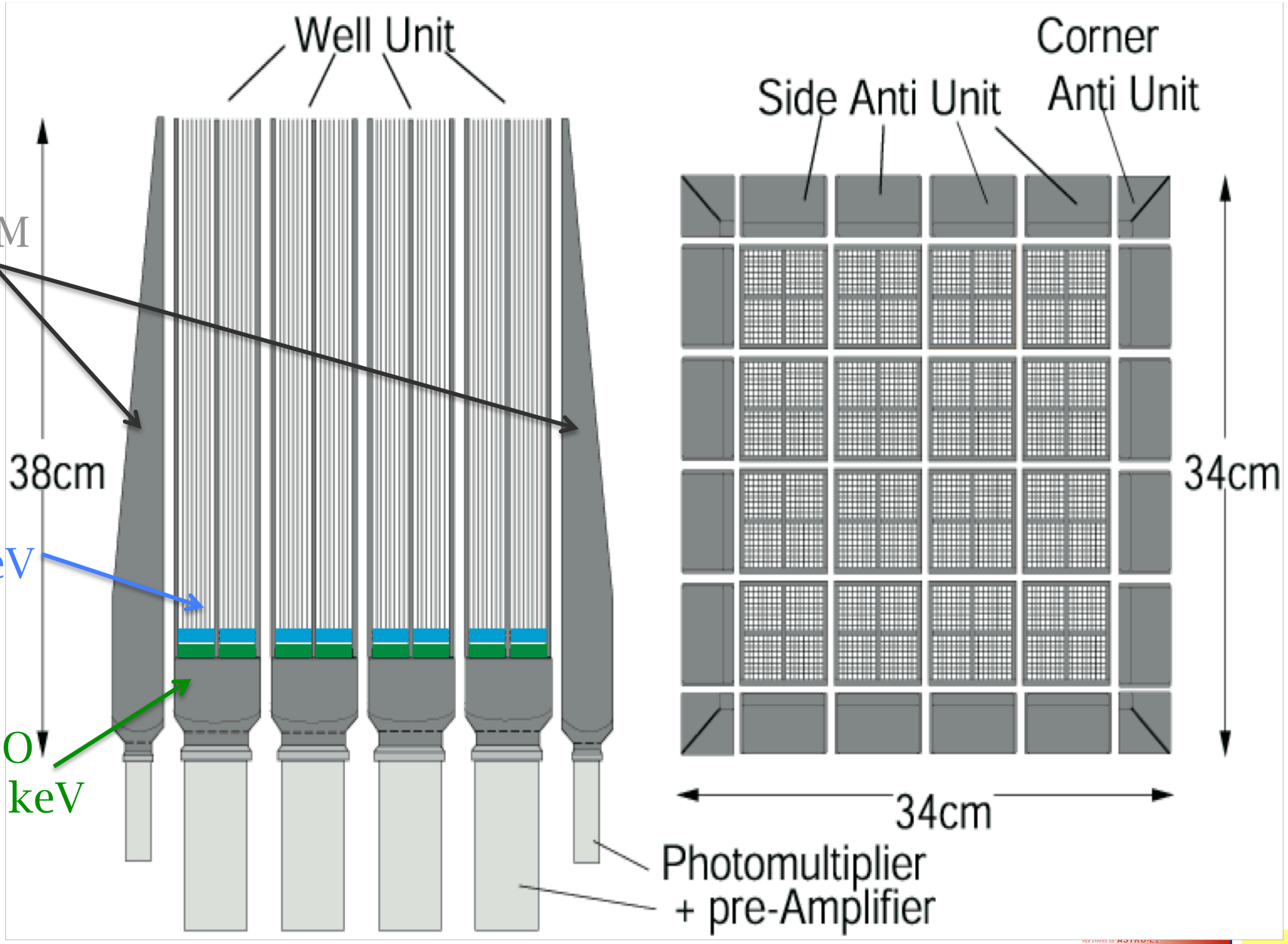
On behalf of the HXD team

IACHEC Meeting at 湘南, 2009, April 27-29th

Beautiful Suzaku wide-band spectra



Overview of Hard X-ray Detector (HXD)



Remaining issues on HXD calibration

- HXD-PIN
  - a discrepancy in normalization
    (XIS : PIN = 1.0 : 1.13 at HXD nominal position)
- HXD-GSO
  - implement “NEW” energy scale
    - activation line energies based on light yield
    - an analog offset shift since the satellite test
  - improvement of a gain history
    - recovery depending on the order of SAA pass
  - Response (simHXD) inc. light yield’s effect

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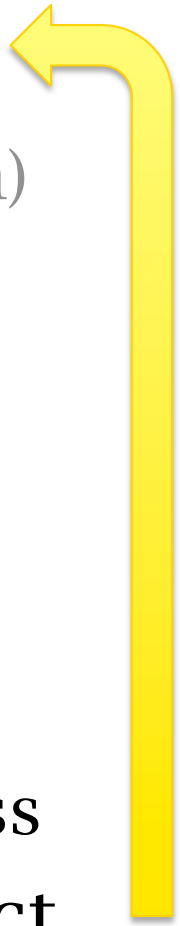
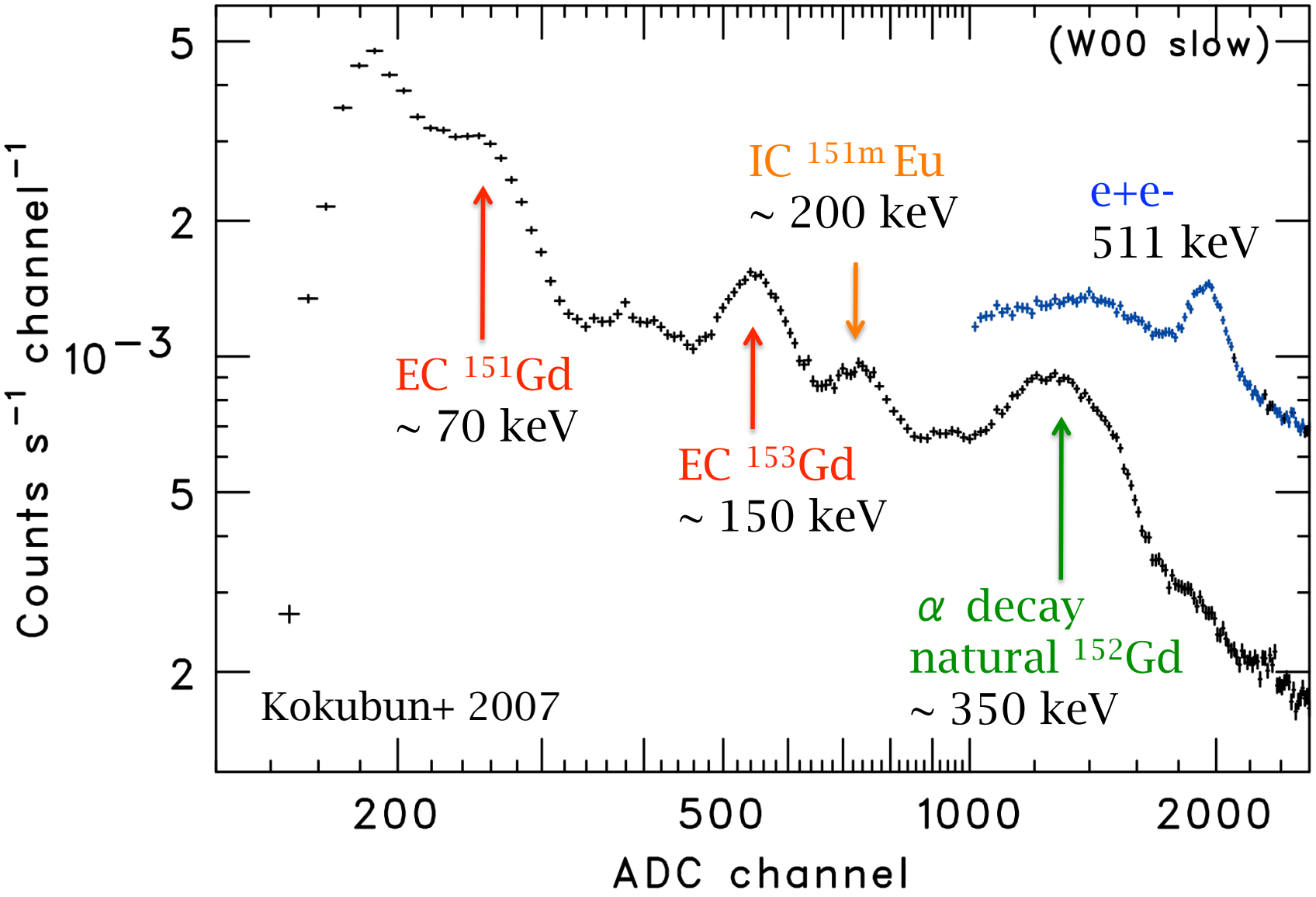


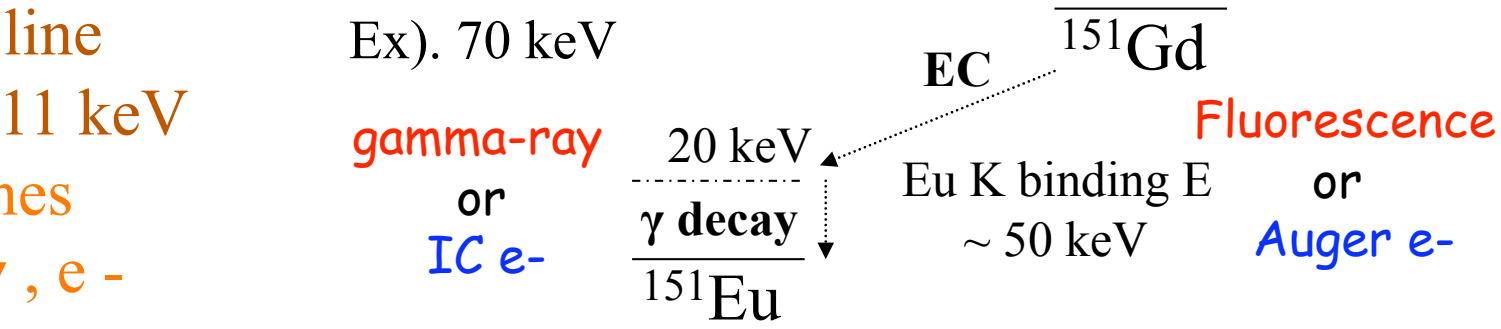
The Background Spectrum of HXD-GSO

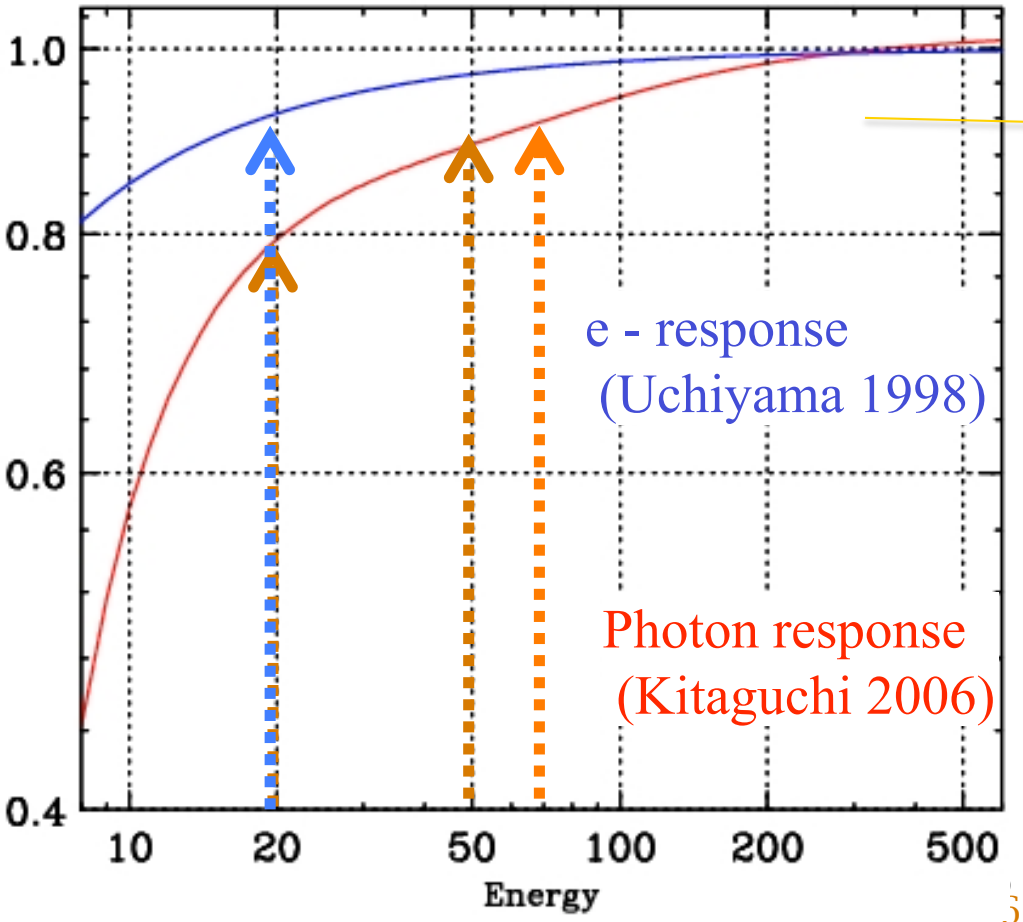


The non-linear effect of light yields in GSO

Annihilation line
→ Single γ 511 keV
Activation lines
→ Multiple γ , e -

Ex). 70 keV



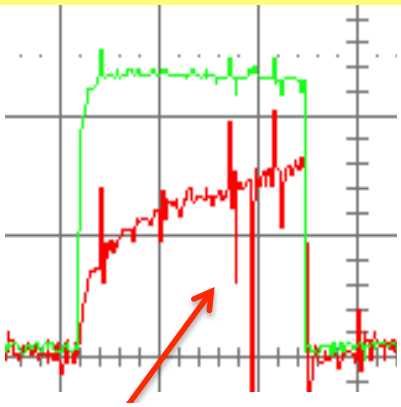


E vs. light yeilds relation of GSO

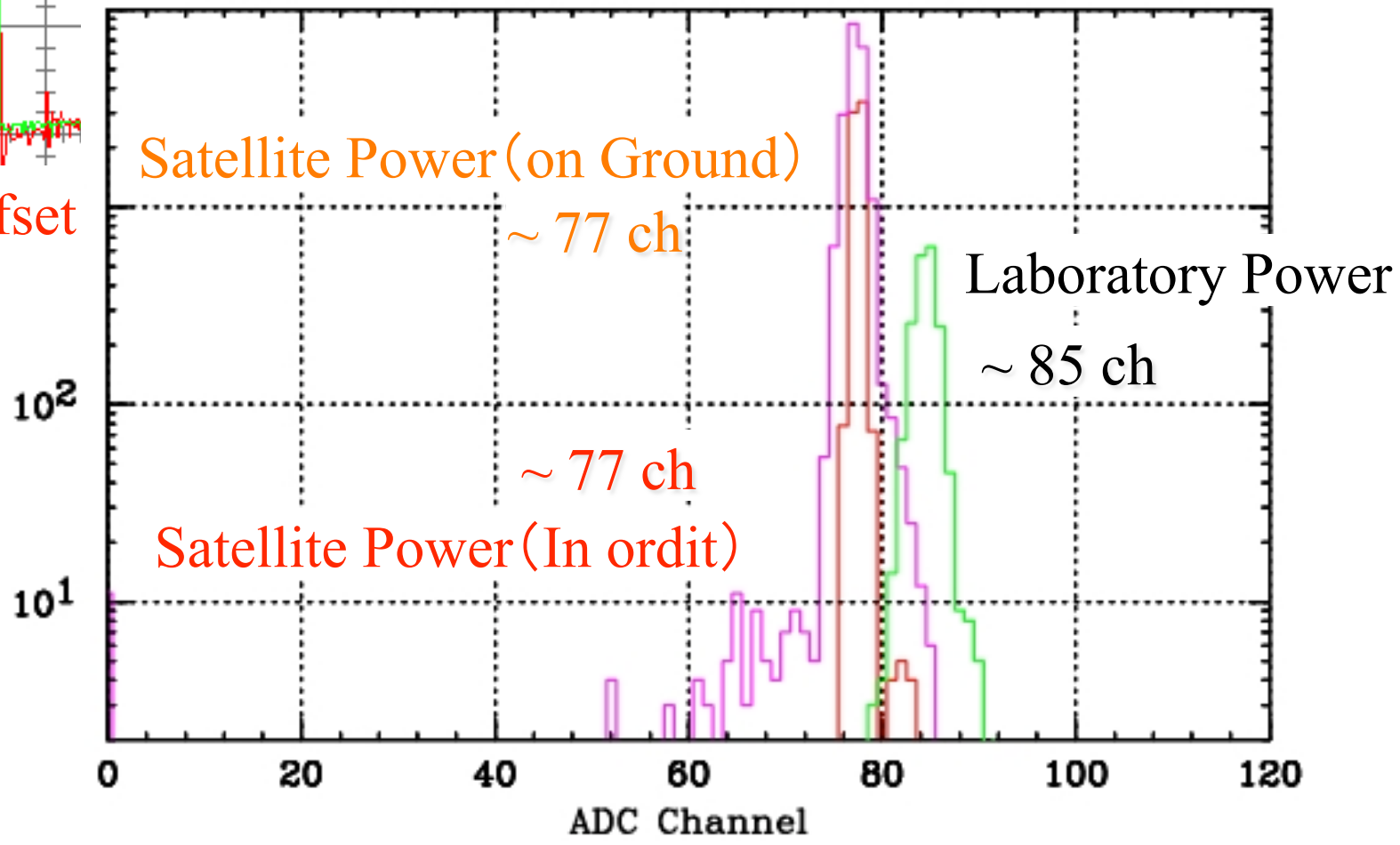
Several e- or γ reduces light yeilds, considering all decay probability, The correct energy are,

70 keV	- 6 %
150 keV	- 5 %
196 keV	- 3 %

The Analog Offset Shift

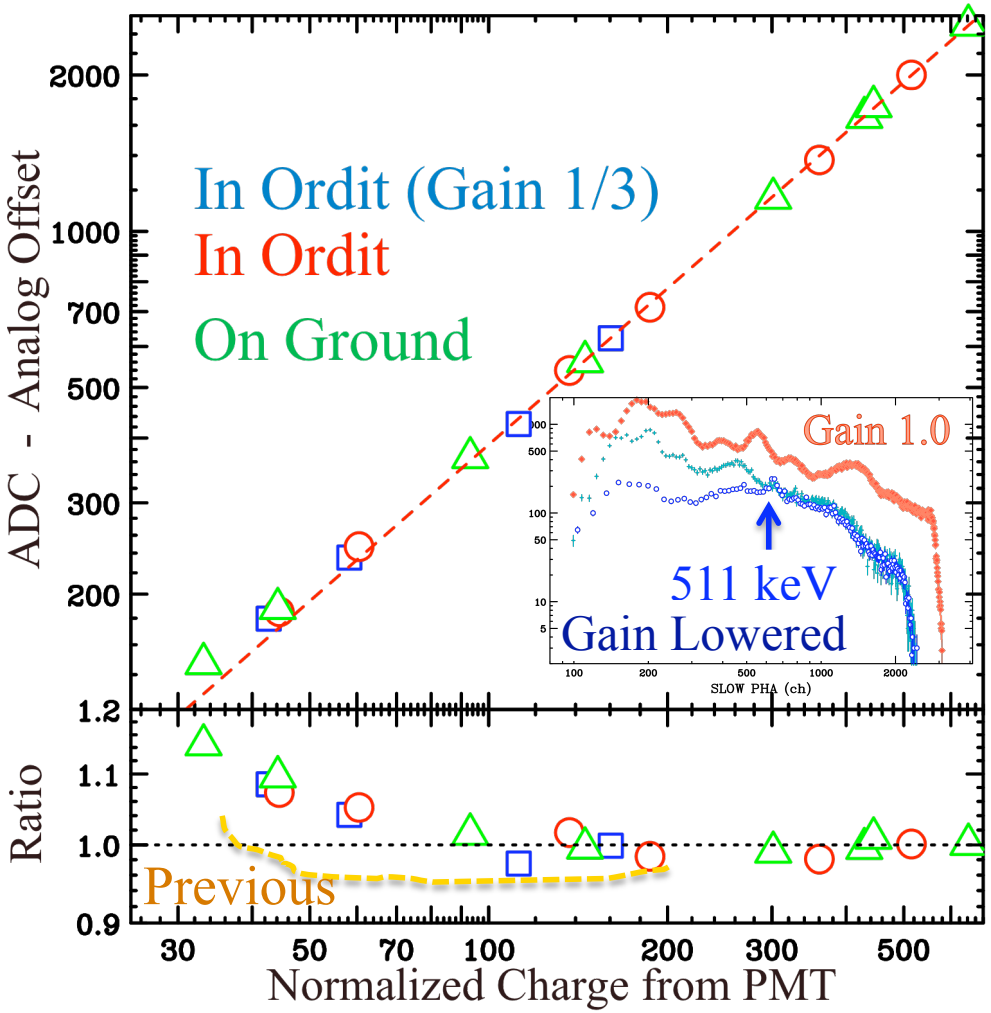


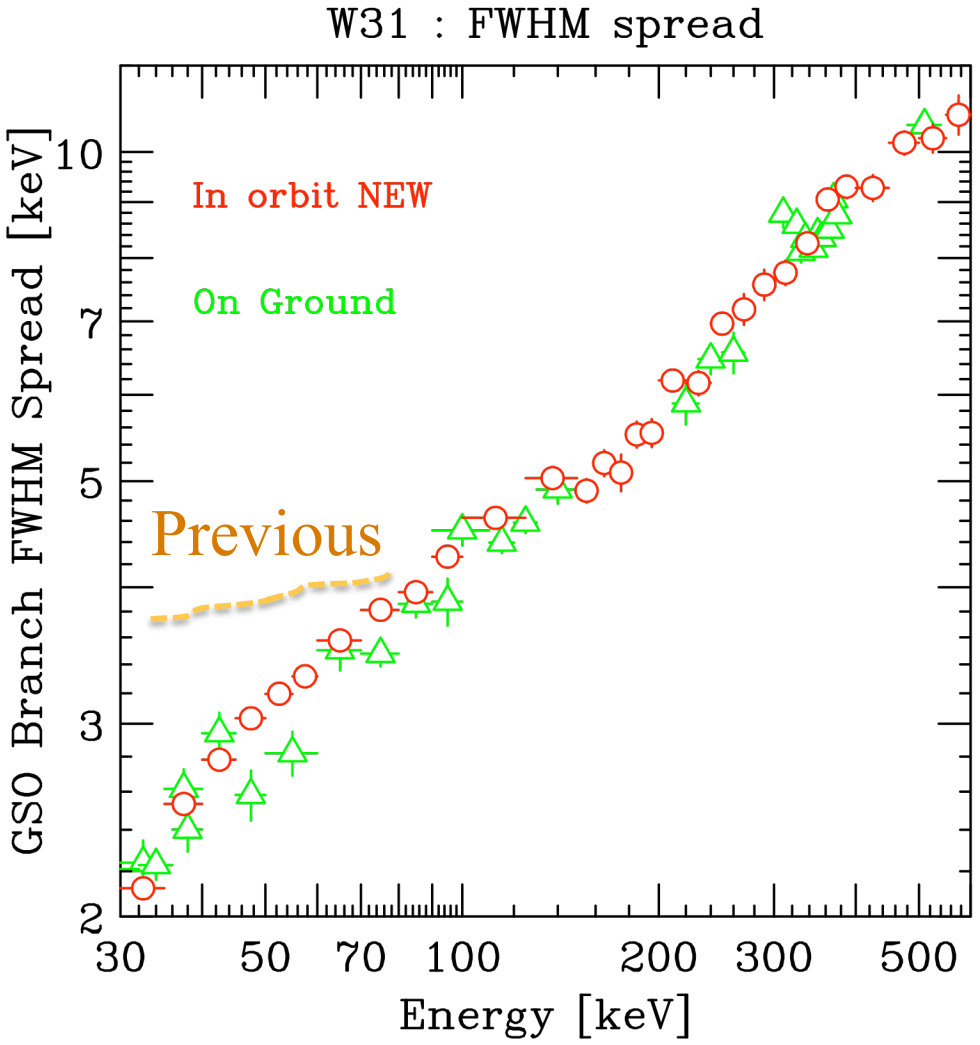
Analog Offset



After using the satellite power, the analog offset changed by ~ 8 ch lower

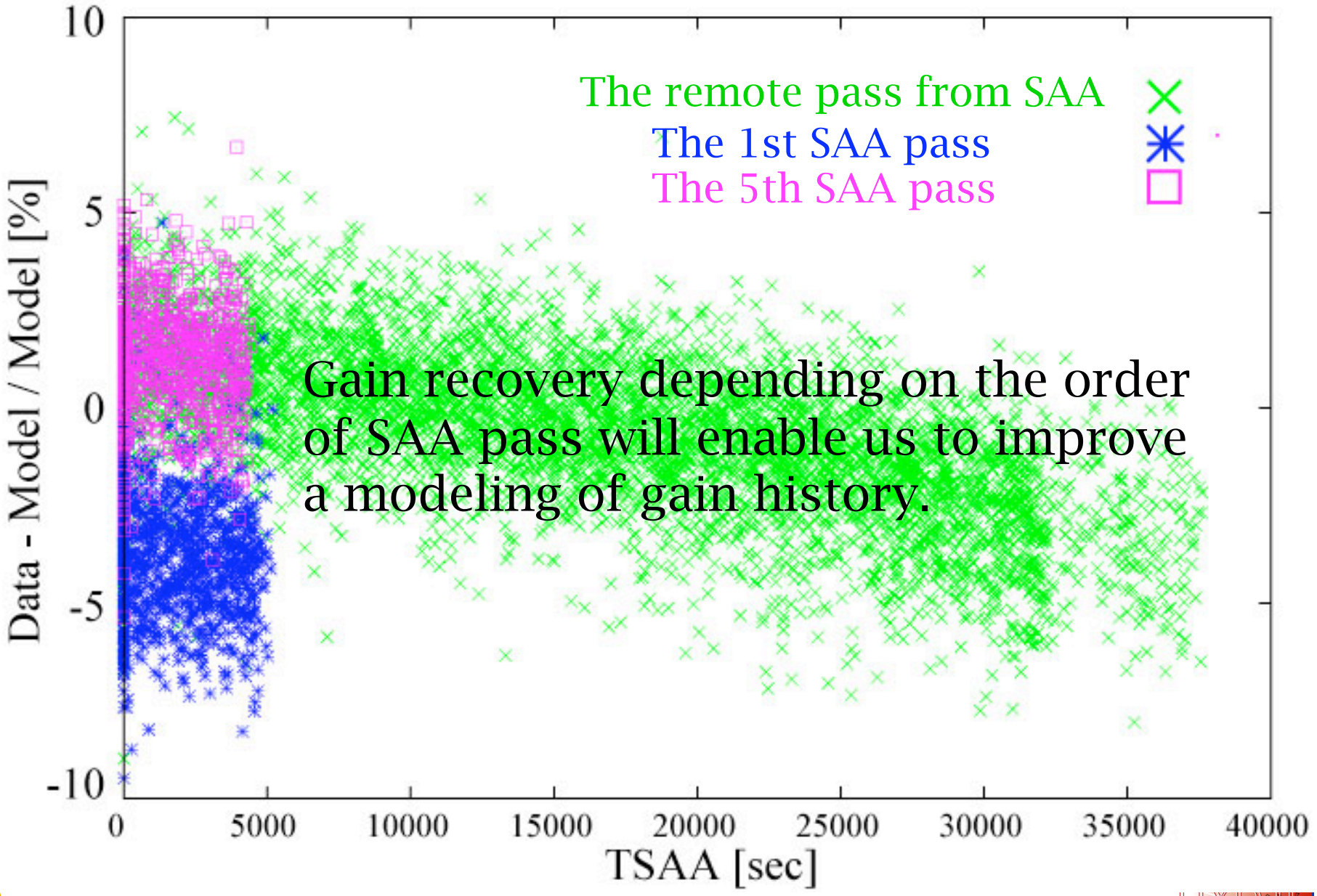
Agreement with On-Ground measurements





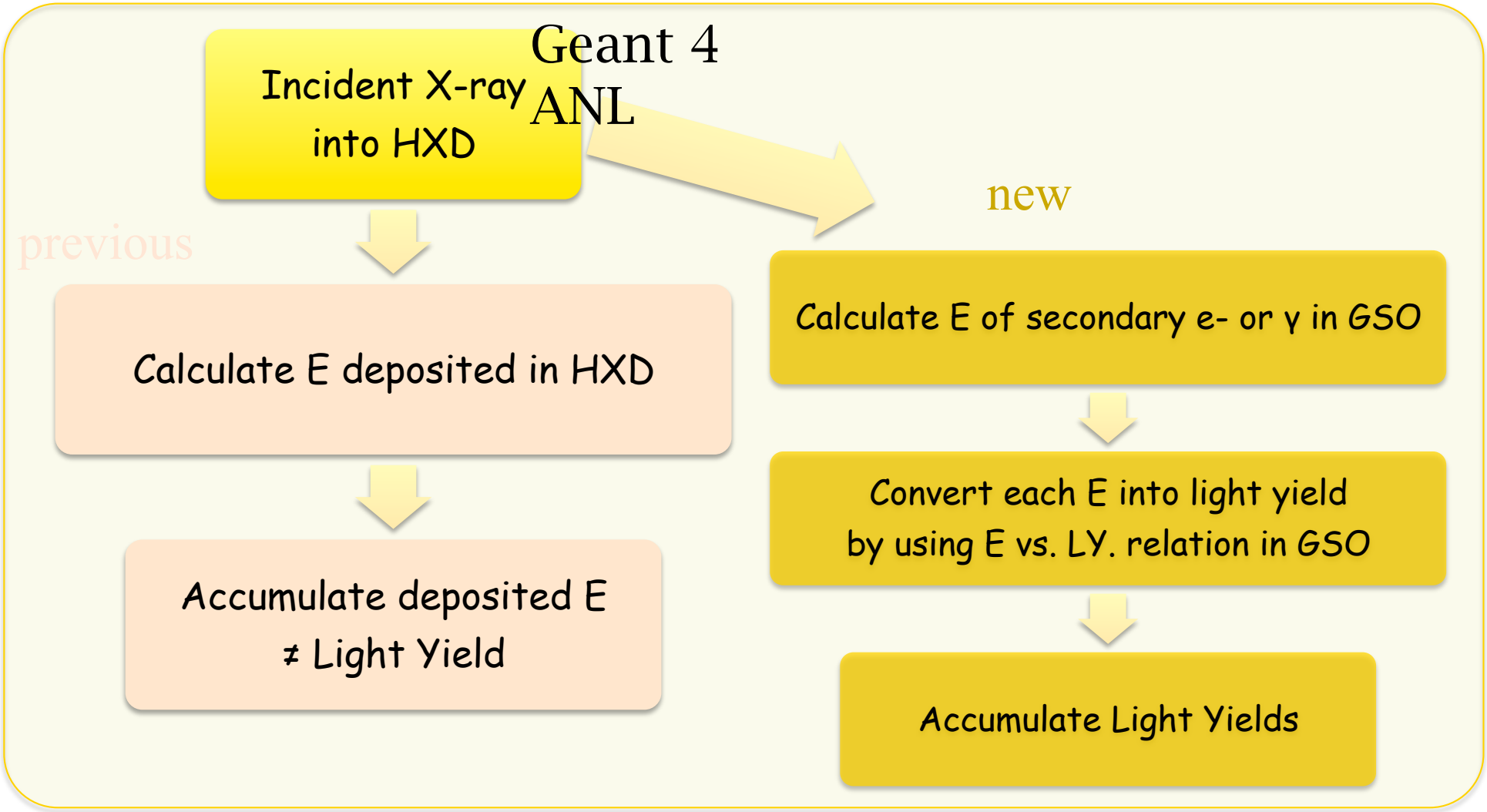
The "NEW" energy scale will be released soon.

Gain change with the order of SAA passes



Response Simulator includes Light yields

SimHXD : Framework of Response Generator (Terada et al. 2005)



A New GSO response will be coming in the near future.

Summary

- HXD on board Suzaku has realized the wide-band and high-quality observation without any serious problems.
- The new HXD-GSO energy scale are obtained by utilizing the calculation of light yield and the shift of an analog offset, which will be released soon.
- The dependency of a gain variation on the order of SAA pass will improve the accuracy of modeling gain history. The new gain history will be created soon.
- The framework of the current response generator (simHXD) is needed to be modified so that it includes the effects of light yield in GSO.

Thank you
(photo; 2004/04/30 HXD completed)