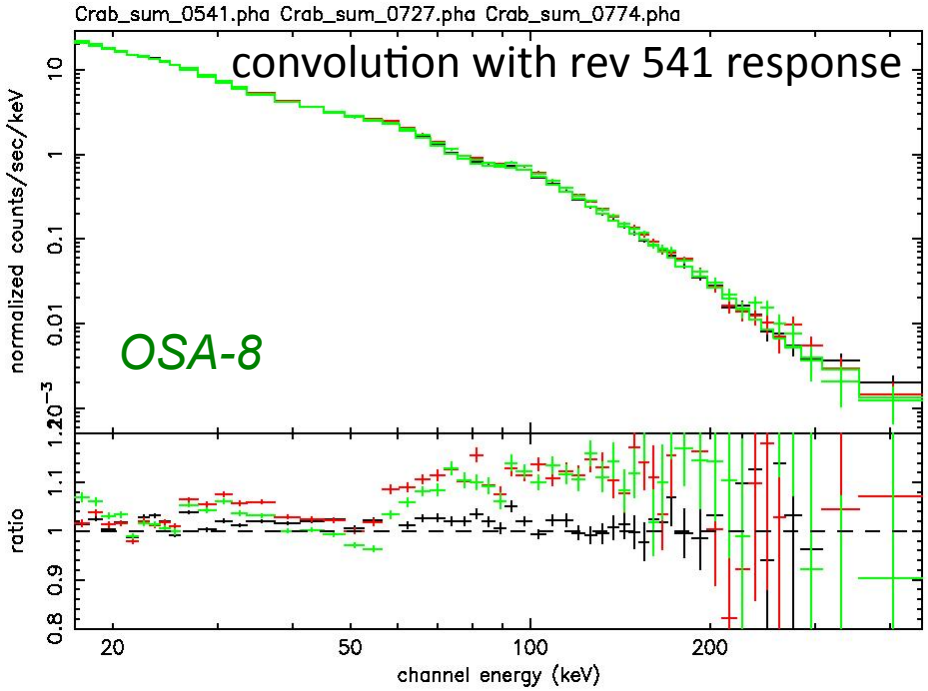
ARFs in the OSA 9 distribution

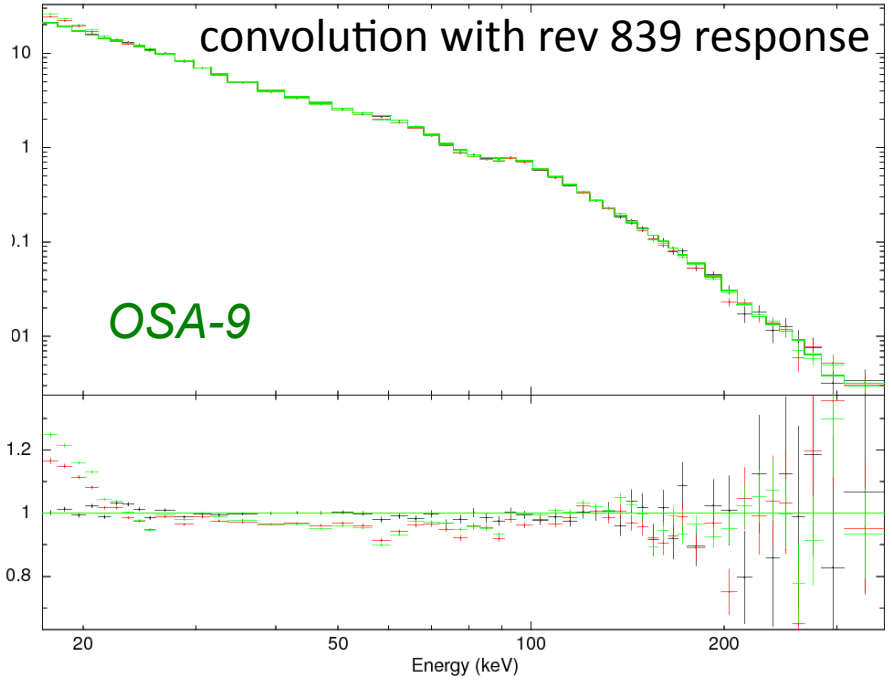
- List of ARFs delivered and validity periods

Period (IJD)	Revolution Interval	Crab observation reference (Rev)
1020.2-1207.9	1-63	Rev. 39
1207.9-1423.2	64-135	102
1423.2-1779.2	136-254	170
1779.2-2126.0	255-370	300
2126.0-2457.9	371-481	422
2457.9-2918.5	482-635	541
2918.5-3262.5	636-750	666
3262.5-3412.1	751-800	774
>3412.1	>801	839

Long term changes in count rate spectra of Crab

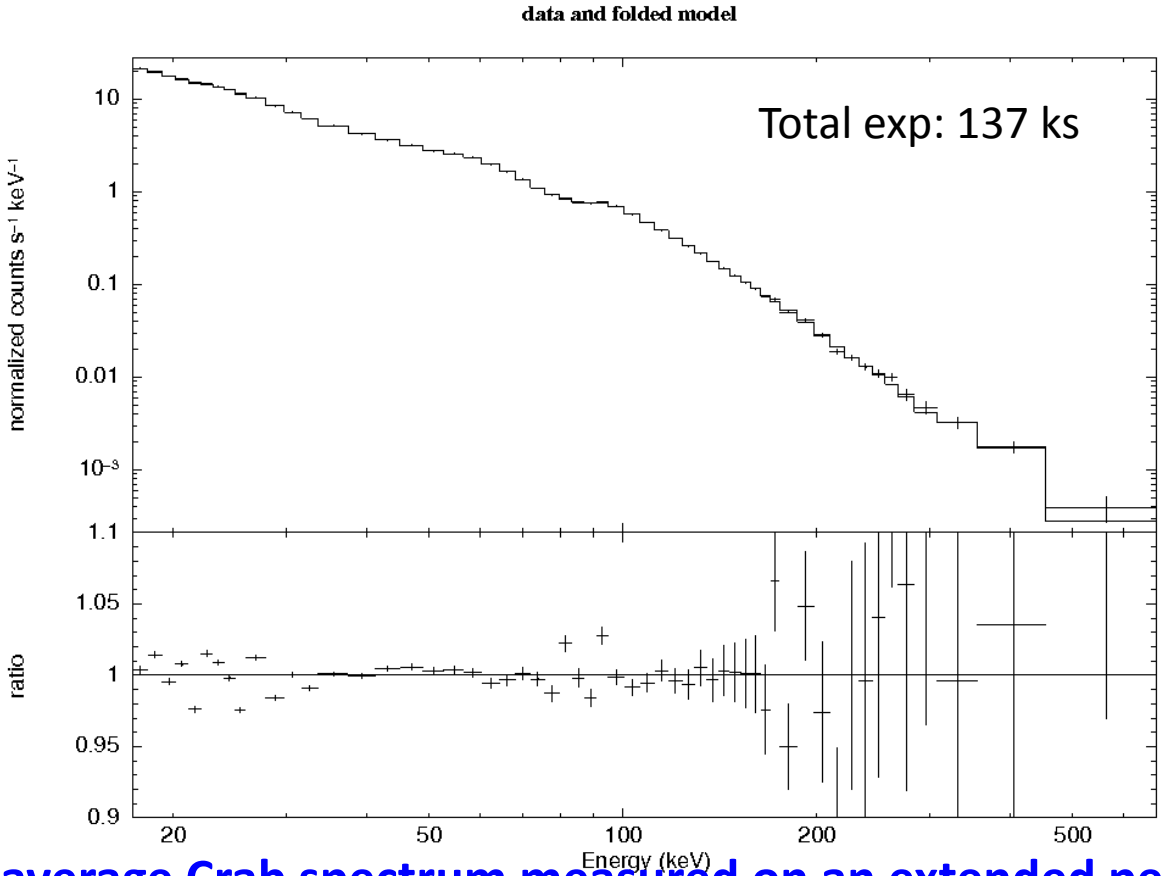


Rev. 541
Rev. 666
Rev. 774



Rev. 839
Rev. 902
Rev. 967

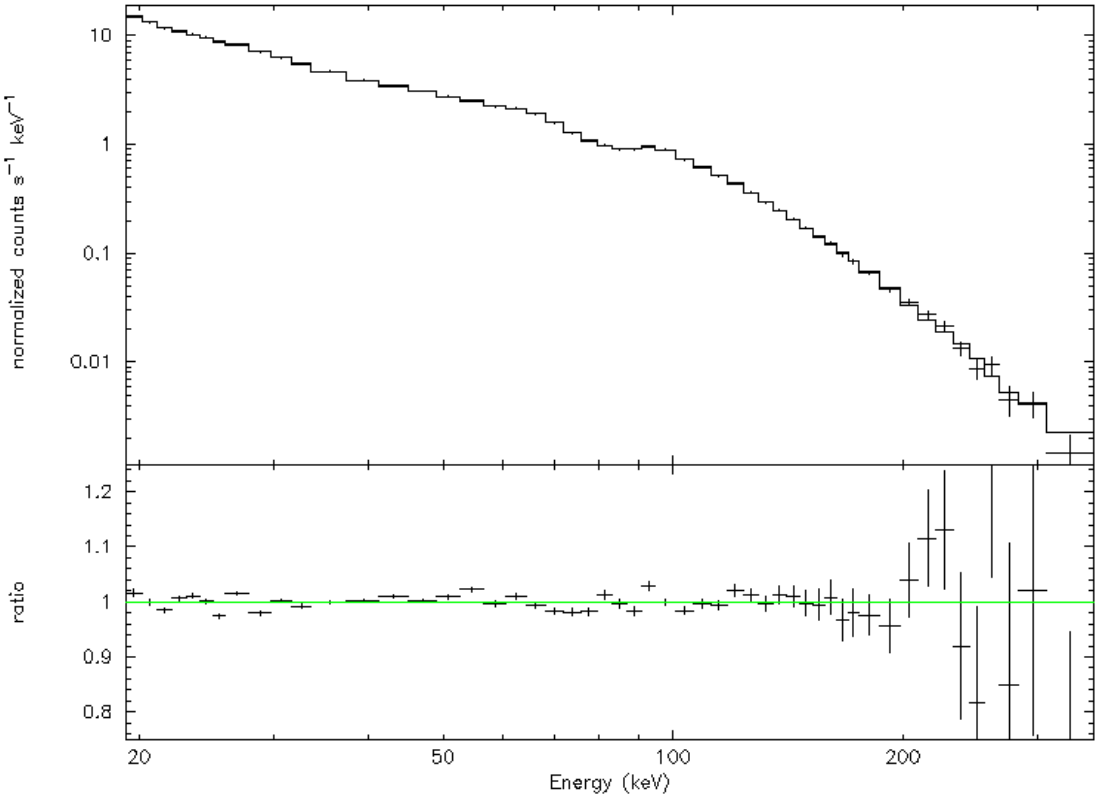
Accuracy of the OSA-9 time dependent correction



Fit of average Crab spectrum measured on an extended period (~2.5 years, source on-axis)

The *ratio* values are at the level of a few % in the single channels

Cyg X-1 rev 929, best correction

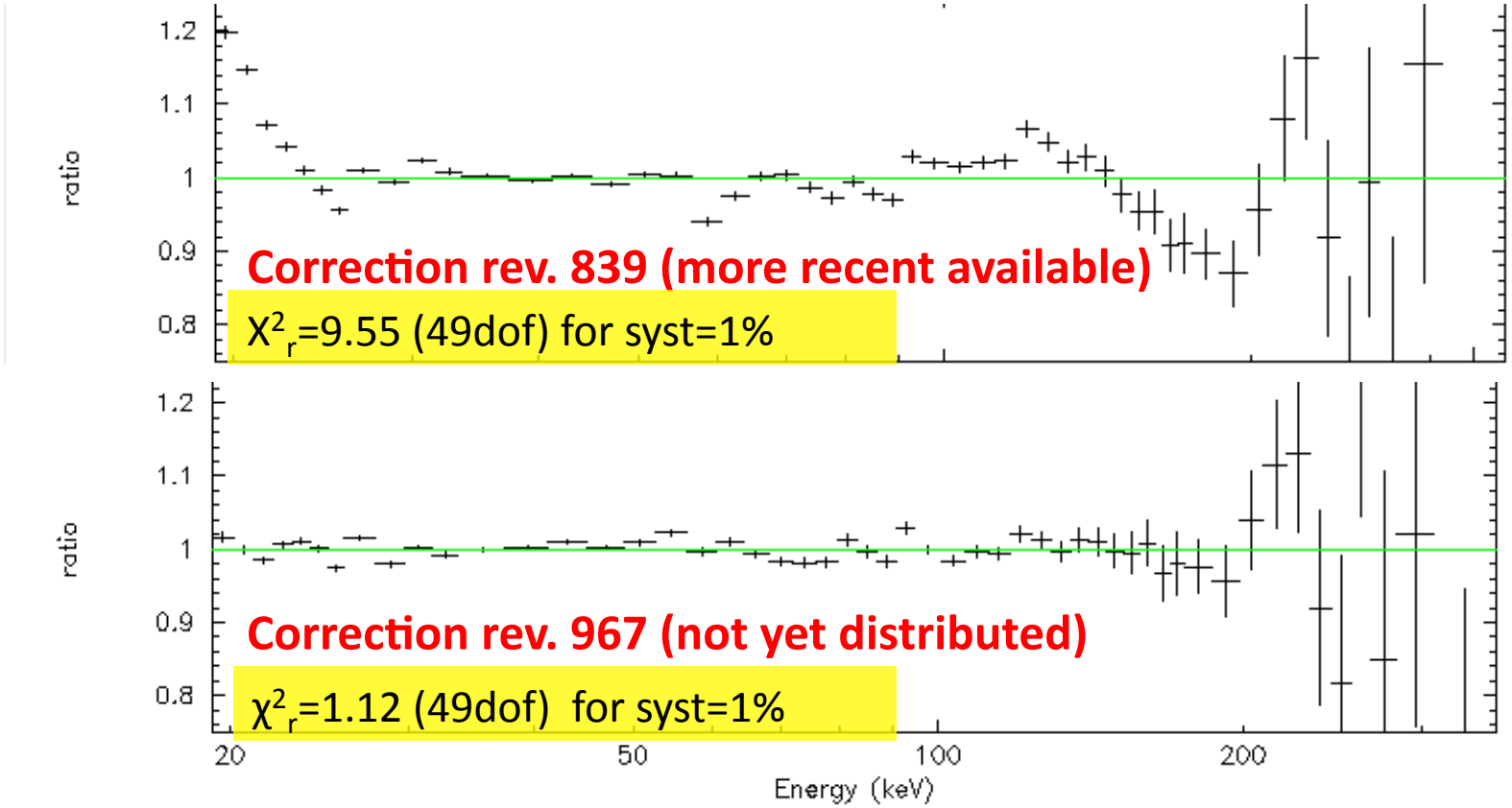


PL with high energy cutoff
Γ=1.46±0.20, E_{cut}=(154±7) keV
$\chi 2_r$=1.12 for syst=1%

Fit of Cyg X-1 spectrum measured on 2010, 24-25 May. Exposure 102 ks

The data are fitted by response obtained from the **Crab observation of rev 967**, (**not currently included in OSA**)

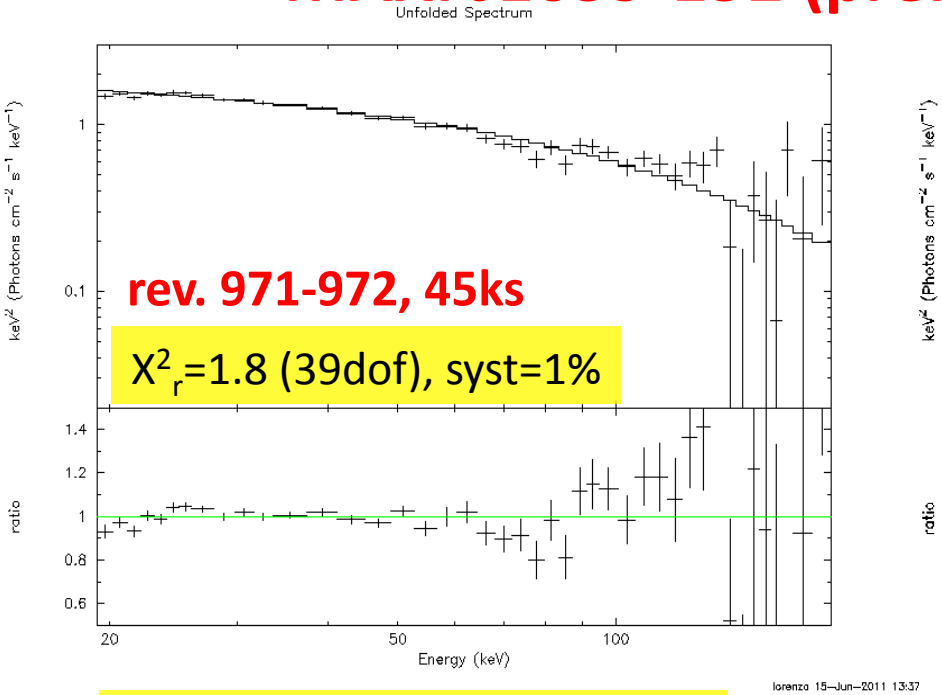
Cyg X-1 rev 929

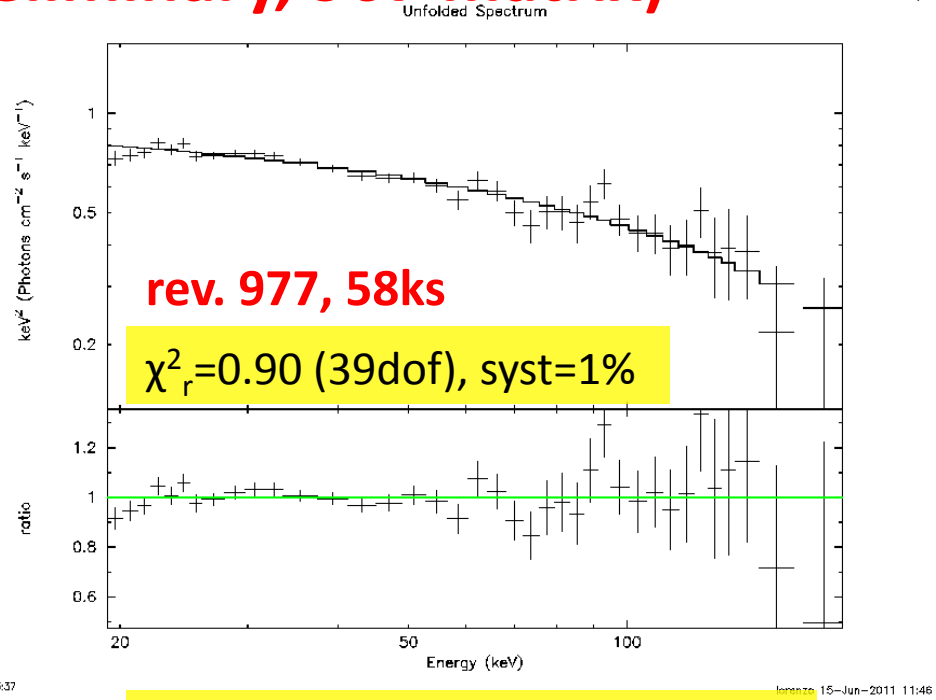


Fit of Cyg X-1 spectrum measured on 2010, 24-25 May

Instrumental features are visible below 25 keV and around 60 keV, generated by the latest delivered calibration Matrix (rev.839)

MAXI J1659-152 (preliminary, 967 matrix)





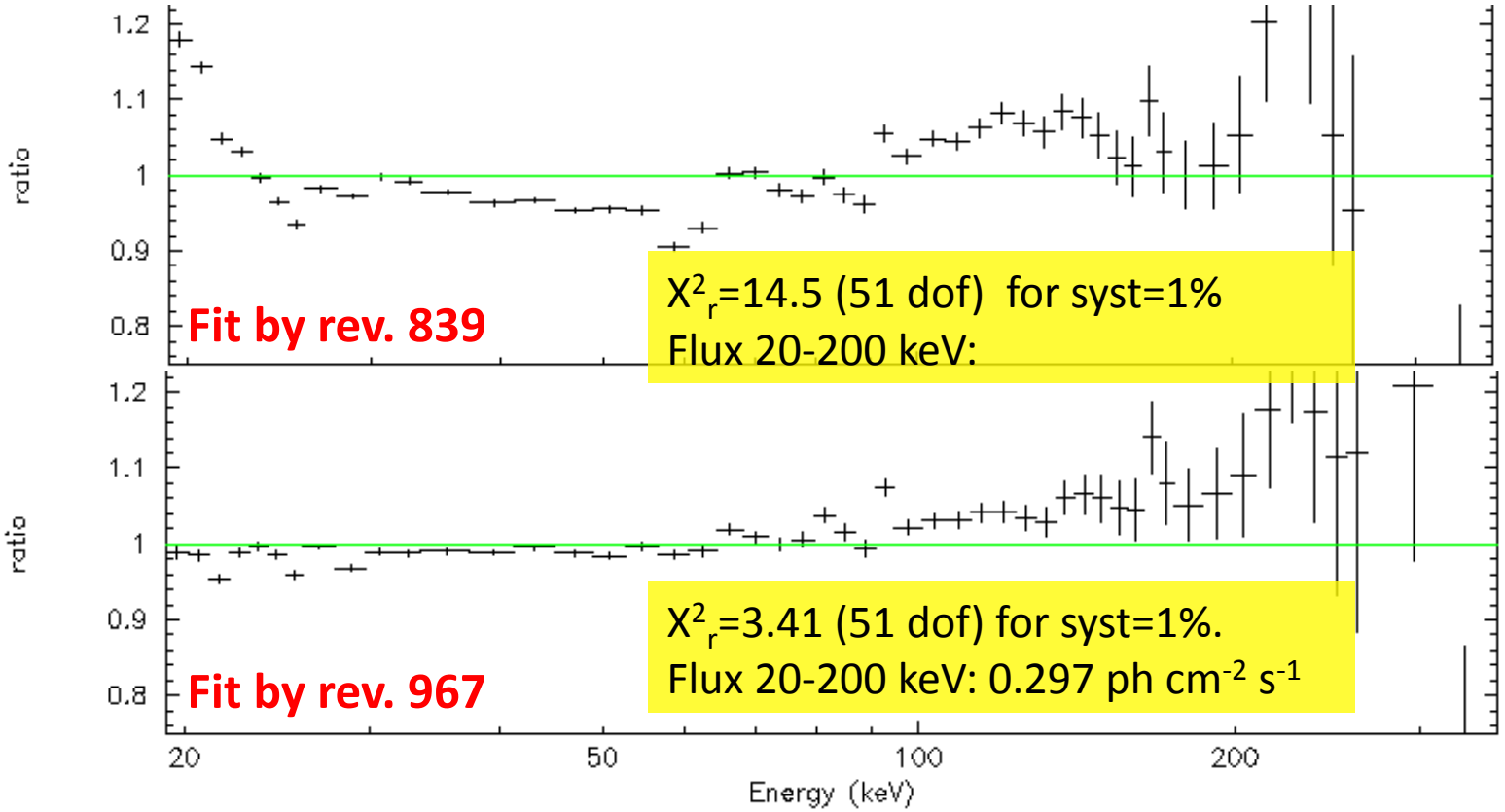
PL with high energy cutoff
Γ=2.03±0.20, E_{cut}=(85±15) keV
$\chi 2_r$=1.83 for syst=1%

PL with high energy cutoff
Γ=2.04±0.12, E_{cut}= 160±50 keV
$X2_r$=0.90 for syst=1%

Fit of MAXI J1659-152 spectra measured in Sept & Oct 2010

The fit is not satisfactory for the rev.971. It improves slightly ($\chi 2_r$=1.6) using a reflection model (pexriv).

Crab rev 1019, 85 ks



Fit of Crab spectrum measured on 2011, 17-19 Feb (83ks)

Similar features as for Cyg X-1 in correction generated by the latest calibration (rev.839). Correction by rev.967 also gives an unsatisfactory fit…working on it…

Conclusions

- The approach of calibration using the Crab as standard candle leads to an efficient correction of systematic features
- There is the urgent need to update the current calibration dataset (ARFs) to avoid instrumental features compromising **spectral measurements below 25 keV**, appearing **since ~rev.900**
- **A new ARF is ready** (rev. 967) and is being delivered to Saclay for testing (P. Laurent and L. Natalucci are working on it)
- In Fall 2011 is expected a further re-calibration, however it is possible that all the ARF dataset will have to be updated due to new *energy correction* (expected for **OSA10**)
- This will be a substantial improvement for the spectral fitting procedure