

# CIAO 2.3 CTI Enhancements

## ACIS\_PROCESS\_EVENTS

Now fully supports adjustment for the effects of charge-transfer inefficiency (CTI)

```
unix% acis_process_events infile= chip3_evt1.fits      \  
                           outfile= chip3_new_evt1.fits  \  
                           apply_cti=yes
```

Only applicable for CCDS 0,1,2,3, and 6 at -120 C

## New CTI-corrected FEFs and gain files

acisD2000-01-29ctiN0002.fits	CTI event correction table with trap density maps
acisD2000-01-29fef_pha_ctiN0001.fits	PHA FEF for CTI-corrected response functions
acisD2000-01-29gain_ctiN0001.fits	Gain for CTI-corrected events PHA-to-PI conversion

## MKRMF

Can now calculate PI matrices directly from PHA FEF files ( PI-on-the-fly )  
(default behavior; requires CALDB 2.18 or later)  
Modified CALDB lookups to work with CTI correction

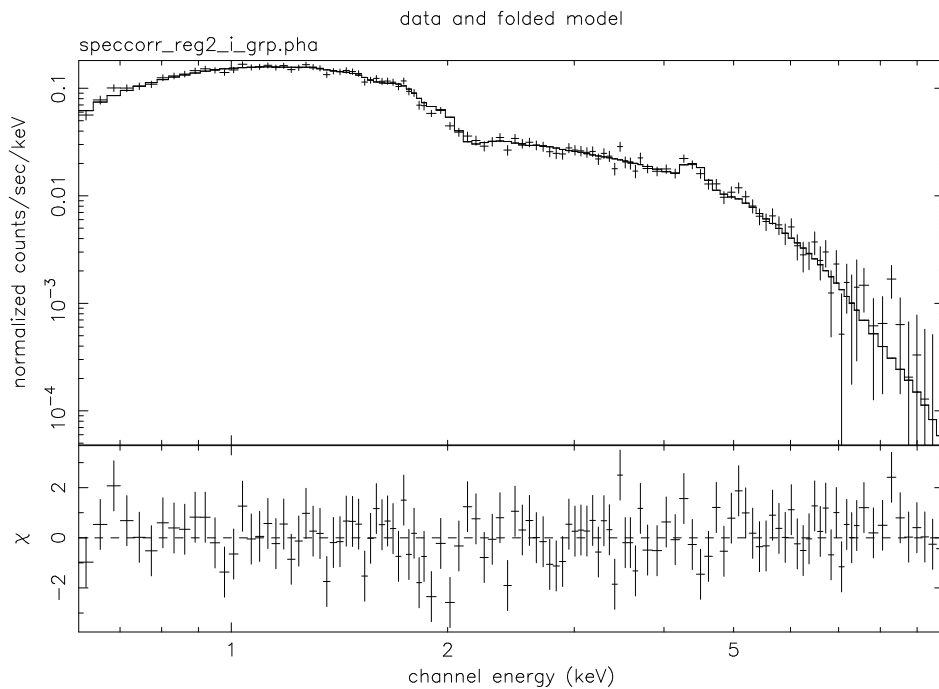


Figure 16: Best PI fit to distant cluster cl0016+16 with CTI-corrected FEFs. The region extends over 15 tiles and two nodes, I3c2 and I3c3.  $\chi^2_\nu = 0.88$ .

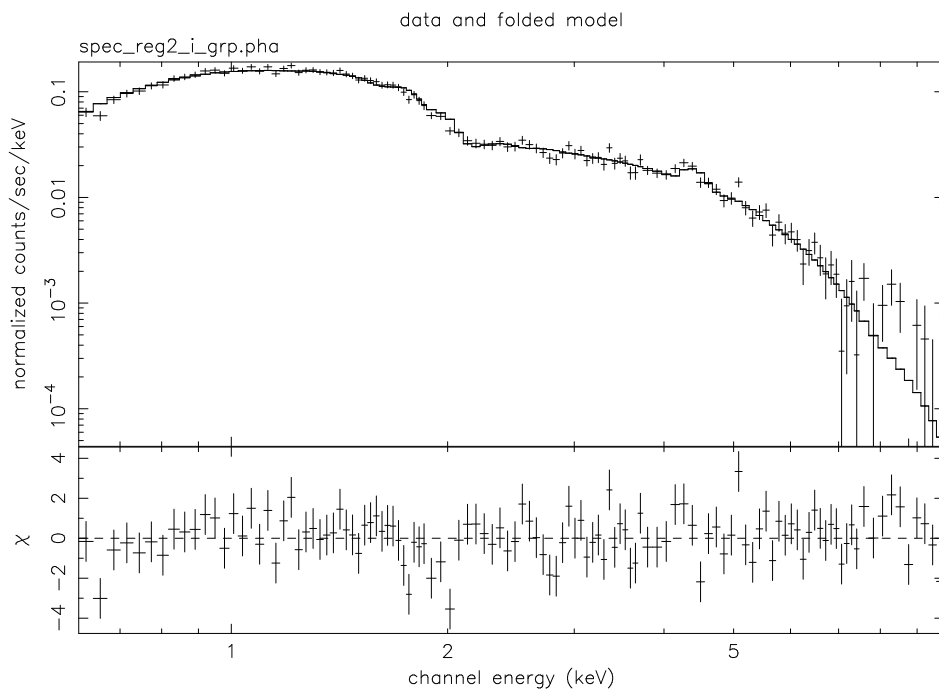


Figure 17: Best PI fit to distant cluster cl0016+16 with existing, released, non-CTI-corrected FEFs.  $\chi^2_\nu = 1.29$ .

The region extends over 15 tiles and two nodes, I3\_2 and I3\_3.

CTI-corrected fit parameters:

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Model: wabs[1]( mekal[2] )

Model par	Fit par	Model comp	Component	Parameter	Unit	Value	
1	1	1	wabs	nH	10 <sup>22</sup>	4.0700E-02	frozen
2	2	2	mekal	kT	keV	10.09	+/- 0.4926
3	3	2	mekal	nH	cm-3	1.000	frozen
4	4	2	mekal	Abundanc		0.2880	+/- 0.5278E-01
5	5	2	mekal	Redshift		0.5410	frozen
6	6	2	mekal	Switch		1.000	frozen
7	7	2	mekal	norm		3.6782E-03	+/- 0.6629E-04

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Chi-Squared = 100.3393 using 117 PHA bins.  
Reduced chi-squared = 0.8801696 for 114 degrees of freedom  
Null hypothesis probability = 0.816

Non CTI-corrected fit parameters:

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Model: wabs[1]( mekal[2] )

Model par	Fit par	Model comp	Component	Parameter	Unit	Value	
1	1	1	wabs	nH	10 <sup>22</sup>	4.0700E-02	frozen
2	2	2	mekal	kT	keV	9.820	+/- 0.4900
3	3	2	mekal	nH	cm-3	1.000	frozen
4	4	2	mekal	Abundanc		0.2154	+/- 0.4928E-01
5	5	2	mekal	Redshift		0.5410	frozen
6	6	2	mekal	Switch		1.000	frozen
7	7	2	mekal	norm		3.7487E-03	+/- 0.6508E-04

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Chi-Squared = 147.3535 using 117 PHA bins.  
Reduced chi-squared = 1.292575 for 114 degrees of freedom  
Null hypothesis probability = 1.935E-02