

# V&V Summary Report

## L2 ASCDS Version : 10.7.1

Observation 22236 - L2 Version 1  
Chandra X-Ray Center

L2 Processing Date : May 28 2019

See axaff22236N001\_VV001\_vvref2.pdf for the full report

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2019.05.29
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	35.637327649236

## Comments

The ACIS focal plane temperature is warmer than -114.0 C degrees during the interval 675424066.61 - 675429965.91 (MET s) of this observation. The ACIS spectral response calibration for the front-illuminated chips is less accurate at these warmer temperatures than it is at -115.0 C. The focal plane temperature during part of this observation was warmer than the upper limit for optimum calibration of the ACIS gain and spectral resolution (i.e., -114.0 C for ACIS-I and -112.0 C for ACIS-S).

The Chandra calibration team calibrates the ACIS gain and spectral resolution using data from the external calibration source (ECS). ECS data show that the frontside-illuminated (FI) CCDs are more temperature sensitive than the backside-illuminated (BI) CCDs.

A summary of the current calibration status of the ACIS gain and spectral resolution can be found at:

[http://asc.harvard.edu/cal/Acis/Cal\\_prods/Gain\\_and\\_Spectral\\_Resolution/A\\_CIS\\_response\\_summary.html](http://asc.harvard.edu/cal/Acis/Cal_prods/Gain_and_Spectral_Resolution/A_CIS_response_summary.html)

The main points are:

- 1) The gain on BI chips remains within 0.3% (i.e., the systematic

uncertainty in the ACIS gain quoted on the Chandra Calibration Status Summary web page) at all measured temperatures.

2) The gain on FI chips remains within 0.3% below row 600 at all measured temperatures.

3) The gain on FI chips above row 600 can be underestimated by as much as 1% for focal plane temperatures exceeding -116 C.

4) The spectral resolution (i.e., FWHM) on BI chips is insensitive to the focal plane temperature.

5) Warmer focal plane temperatures increase the FWHM on FI chips by up to 30 eV near row 512 and by up to 70 eV near the top of the chips.

In summary, the user should be cautious in the spectral analysis of high S/N emission lines detected on the top half of FI chips in this observation. Default processing with the current version of the CALDB will underestimate photon energies by up to 1% and broaden emission lines by up to 70 eV.

seq_num	801762	Sequence number
obs_id	22236	Observation id
title	Shock structure, the electron-ion equilibration timescale and the disintegrating cool core in A2146	Proposal title
observer	Helen Russell	Principal investigator
object	Abell 2146	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	239.06125	Observer's specified target RA [deg]
dec_targ	66.346917	Observer's specified target Dec [deg]
ra_nom	238.91924159939	Nominal RA [deg]
dec_nom	66.379231725886	Nominal Dec [deg]
roll_nom	196.33882459969	Nominal Roll [deg]
revision	1	Processing version of data
ontime	35637.327649236	Sum of GTIs [s]
livetime	35171.69972768	Livetime [s]
ontime0	35621.499368072	Sum of GTIs [s]
ontime1	35634.104519129	Sum of GTIs [s]
ontime2	35627.863578439	Sum of GTIs [s]
ontime3	35637.327649236	Sum of GTIs [s]
ontime6	35634.022488952	Sum of GTIs [s]
l2events	143486	Number of level 2 events

