

V&V Summary Report

L2 ASCDS Version : 10.7.1

Observation 22173 - L2 Version 2
Chandra X-Ray Center

L2 Processing Date : Apr 18 2019

See [axaff22173N002_VV001_vvref2.pdf](#) for the full report

V&V Scientist	Beth Sundheim
V&V Date (YYYY-MM-DD)	2019.04.18
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	22.51524283278

Comments

A spatial region of the original bias map for CCD = 3 suffered from anomalously high data values. Pixels in the event data that were bias-corrected by one of the original affected bias pixels may have an apparent energy shift. While the change in energy is expected to be small (~20 eV), it depends on many parameters that have not yet been fully explored for this bias anomaly. The bias map for CCD = 3 has been reconstructed for this processing to remove this anomaly using scaled data from a comparable bias map from another observation. The pixels affected by the anomaly are bounded by sky coords:

(307.85524,44.11127), (307.86221,44.11065), (307.86632,44.13487),
(307.85771,44.12589).

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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

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	502997	Sequence number
obs_id	22173	Observation id
title	PSR J2030+4415: A Breakthrough Target for Bowshock Studies	Proposa
observer	Roger Romani	Principal investigator
object	PSR J2030+4415	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	307.714167	Observer's specified target RA [deg]
dec_targ	44.260861	Observer's specified target Dec [deg]
ra_nom	307.70943196931	Nominal RA [deg]
dec_nom	44.263416784333	Nominal Dec [deg]
roll_nom	83.15995603237	Nominal Roll [deg]
revision	2	Processing version of data
ontime	22515.24283278	Sum of GTIs [s]
livetime	22221.064609689	Livetime [s]
ontime2	22511.937702537	Sum of GTIs [s]
ontime3	22515.160752773	Sum of GTIs [s]
ontime6	22515.201792836	Sum of GTIs [s]
ontime7	22515.24283278	Sum of GTIs [s]
ontime8	22508.837732196	Sum of GTIs [s]
l2events	160254	Number of level 2 events

