V&V Summary Report
L2 ASCDS Version : 8.4.5

Observation 1794 - L2 Version 10
Chandra X-Ray Center

L2 Processing Date : Apr 5 2019

See axaff01794N007_VV001_vvref2.pdf for the full report

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2019.04.15
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	21.161

Comments

Note: off-axis (13.7 arcmin) and psf-broadened. In tgextract, the off-axis source extent requires the tg_d range to be increased. Used custom extraction regions.
Reprocessed using the following method: Grating region information for custom extractions. Columns x, y, r, w give parameters for tg_create_mask Columns s1, s2, d1, d2, u1, u2 give paramters for tgextract. Customized parts of the usage are as follows: tg_create_mask use_user_pars = yes sA_zero_x = $x sA_zero_y = $y sA_zero_rad = $r sA_width_heg = $w sA_width_meg = $w sA_width_leg = $w tgextract min_tg_d = $s1 max_tg_d = $s2 min_downbkg_tg_d = $d1 max_downbkg_tg_d = $d2 min_upbkg_tg_d = $u1 max_upbkg_tg_d = $u2 PKS 2155 series (LETG/ACIS): # obsid x y r w s1 s2 d1 d2 u1 u2 1794 2586.22 4820.53 86.59 919.04 -8.099e-03 8.099e-03 -3.045e-02 -9.718e-03 2.430e-02 7.192e-02.
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Zeroth order is extended. The zeroth order sky position was determined using a software tool developed by CXC called findzero, which is available in CIAO as part of the tgdetect2 tool. The tool calculates the point of intersection of the readout streak on the ACIS CCD and the meg dispersed spectral arm, rather than using a centroid position of the source. The findzero results are more accurate than source centroid in

this case.
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To compensate for a few bad pixels not marked as bad that were not
removed in the Level 2 processing, a custom bad pixel file with
additional bad pixels at (chipx, chipy) = (232:234,322:339) in S1 was
added in this processing. As a result, the user will NOT find a
relatively bright square of pixels on the S1 chip for level 2 data
caused by the application of the dither algorithm to the bad pixels in
question, as opposed to previous processing(s).
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The ACIS focal plane temperature is warmer than -114.0 C degrees during
the interval 82439689.74 - 82455532.94 (MET s) of this observation.
This temperature is the upper limit of the verified ACIS calibration for
the front-illuminated chips. The focal plane temperature is warmer than
-112.0 C during the interval 82439689.74 - 82453513.74 (MET s) of this
observation. This temperature is the upper limit of the verified ACIS
calibration for the back-illuminated chips. 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	390012	Sequence number
obs_id	1794	Observation id
title	GRATINGS CALIBRATION OBSERVATIONS OF PKS2155-304	Proposal title
observer	Dr. CXC Calibration	Principal investigator
object	PKS2155-304	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	329.716667	Observer's specified target RA [deg]
dec_targ	-30.225556	Observer's specified target Dec [deg]
ra_nom	329.4774750894	Nominal RA [deg]
dec_nom	-30.32457315319	Nominal Dec [deg]
roll_nom	25.261647347543	Nominal Roll [deg]
revision	10	Processing version of data
ontime	21158.40001969	Sum of GTIs [s]
livetime	20890.479618582	Livetime [s]
ontime4	21158.40001969	Sum of GTIs [s]
ontime5	21158.40001969	Sum of GTIs [s]
ontime6	21158.40001969	Sum of GTIs [s]
ontime7	21158.40001969	Sum of GTIs [s]
ontime8	21155.159029543	Sum of GTIs [s]
ontime9	21155.159029543	Sum of GTIs [s]
l2events	258550	Number of level 2 events