V&V Summary Report
L2 ASCDS Version : 8.4.5

Observation 1793 - L2 Version 11
Chandra X-Ray Center

L2 Processing Date : Apr 4 2019

See axaff01793N008_VV001_vvref2.pdf for the full report

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2019.04.11
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	21.161

Comments

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Target far off-axis --- required custom region parameters (detailed
below).
===
WARNING: the grating line-spread-function is not calibrated off-axis;
there is no valid grating RMF data for this observation. Target very
off-axis. In tg_create_mask, the zeroth order region needs to be
decreased; off-axis, the default size is too large and causes short
wavelengths to be omitted from grating region. In tgextract, the
off-axis source extent requires the tg_d range to be increased.
===
Reprocessed using the following method: 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 1791
3242.07 4497.14 47.96 598.78 -3.401e-03 3.401e-03 -2.592e-02 -3.887e-03
3.887e-03 2.592e-02.
=====
```

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.
=====
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).
====
The focal plane temperature is warmer than -112.0 C during the interval
82417774.72 - 82438933.12 (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	390011	Sequence number
obs_id	1793	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	329.514151618	Nominal RA [deg]
dec_nom	-30.313392343199	Nominal Dec [deg]
roll_nom	26.244106104089	Nominal Roll [deg]
revision	11	Processing version of data
ontime	21160.155836657	Sum of GTIs [s]
livetime	20892.213202337	Livetime [s]
ontime4	21160.237886757	Sum of GTIs [s]
ontime5	21160.155836657	Sum of GTIs [s]
ontime6	21160.114796668	Sum of GTIs [s]
ontime7	21160.196846753	Sum of GTIs [s]
ontime8	21160.073756665	Sum of GTIs [s]
ontime9	21160.032686755	Sum of GTIs [s]
l2events	272326	Number of level 2 events