Catalog of Known Data Product Issues Index

Last updated January 28, 2022

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HAWC SERIES		
SERIES	**MISSION ID**	**ISSUES**
OC4L	2016-12-01_HA_F353, 2016-12-03_HA_F354, 2016-12-06_HA_F355, 2016-12-08_HA_F356, 2016-12-09_HA_F357, 2016-12-14_HA_F358, 2016-12-15_HA_F359, 2016-12-16_HA_F360	HAIMG_01, HALISS_01a, HALISS_01b HAPOL_01, HAPOL_03[FT355 Only]
OC5E	2017-05-11_HA_F393, 2017-05-12_HA_F394, 2017-05-13_HA_F395, 2017-05-17_HA_F396, 2017-05-18_HA_F397	
OC5N	2017-10-17_HA_F440, 2017-10-18_HA_F441, 2017-10-19_HA_F442, 2017-10-20_HA_F443, 2017-10-24_HA_F444, 2017-10-25_HA_F445, 2017-10-26_HA_F446, 2017-10-27_HA_F447, 2017-10-31_HA_F448, 2017-11-07_HA_F449, 2017-11-09_HA_F450, 2017-11-14_HA_F451, 2017-11-15_HA_F452, 2017-11-16_HA_F453, 2017-11-17_HA_F454	HAIMG_01, HALISS_01a, HALISS_01b HAPOL_01, HAPOL_02
OC9E	2021-11-03_HA_F886, 2021-11-04_HA_F887, 2021-11-05_HA_F888	HALISS_01a, HALISS_01b HAPOL_04

FORCAST SERIES		
SERIES	**MISSION ID**	**ISSUES**
OC1B	2013-06-21_FO_F108, 2013-06-26_FO_F109, 2013-07-02_FO_F110	IMG_01, IMG_02, IMG_03, IMG_04A, IMG_09, IMG_10 GRI_02, GRI_03, GRI_05,GRI_06, GRI_07
OC1DF	2013-09-10_FO_F128, 2013-09-12_FO_F129, 2013-09-13_FO_F130, 2013-09-17_FO_F131, 2013-09-19_FO_F132, 2013-10-25_FO_F135	IMG_03, IMG_04A, IMG_09, IMG_10 GRI_02, GRI_03, GRI_05, GRI_06, GRI_07

FORCAST SERIES		
SERIES	**MISSION ID**	**ISSUES**
OC2B	2014-03-20_FO_F153, 2014-03-22_FO_F154, 2014-03-25_FO_F155, 2014-03-27_FO_F156, 2014-03-29_FO_F157	IMG_04A, IMG_09, IMG_10 GRI_02, GRI_08
OC2D	2014-05-01_FO_F165, 2014-05-02_FO_F166, 2014-05-03_FO_F167, 2014-05-06_FO_F168, 2014-05-07_FO_F169, 2014-05-08_FO_F170	IMG_04A, IMG_06, IMG_09, IMG_10 GRI_01, GRI_02, GRI_04, GRI_10
OC2F	2014-06-04_FO_F176, 2014-06-06_FO_F177, 2014-06-11_FO_F178, 2014-06-13_FO_F179	
OC2H	2015-01-29_FO_F190, 2015-02-04_FO_F191, 2015-02-05_FO_F192, 2015-02-06_FO_F193	IMG_04B, IMG_05,IMG_08, IMG_09, IMG_10 GRI_01, GRI_02, GRI_04, GRI_09, GRI_10
OC3C	2015-05-29_FO_F211, 2015-05-30_FO_F212, 2015-06-03_FO_F214, 2015-06-04_FO_F215, 2015-06-05_FO_F216, 2015-06-13_FO_F217	
OC3D	2015-06-19_FO_F219, 2015-06-23_FO_F220, 2015-06-24_FO_F221, 2015-06-28_FP_F222, 2015-07-03_FO_F224, 2015-07-04_FO_F225, 2015-07-06_FO_F226, 2015-07-07_FO_F227	
OC3I	2015-09-11_FO_F238, 2015-09-16_FO_F239, 2015-09-17_FO_F240, 2015-09-18_FO_F241, 2015-09-22_FO_F242	IMG_04B, IMG_05,IMG_08, IMG_09, IMG_10 GRI_01, GRI_02, GRI_04, GRI_10
OC3L	2015-11-04_FO_F254, 2015-11-05_FO_F255, 2015-11-06_FO_F256, 2015-11-10_FO_F257, 2015-11-13_FO_F258, 2015-11-14_FO_F259, 2015-11-19_FO_F260, 2015-11-20_FO_F261	IMG_04C, IMG_05, IMG_07,IMG_08, IMG_09, IMG_10 GRI_01, GRI_02, GRI_04, GRI_10
OC4A	2016-02-04_FO_F272, 2016-02-05_FO_F273, 2016-02-06_FO_F274, 2016-02-09_FO_F275, 2016-02-10_FO_F276, 2016-02-11_FO_F277, 2016-02-17_FO_F278, 2016-02-18_FO_F279	IMG_04D, IMG_05, IMG_08, IMG_09, IMG_10 GRI_01, GRI_02, GRI_04, GRI_10

FORCAST SERIES		
SERIES	**MISSION ID**	**ISSUES**
OC4G	2016-07-11_FO_F318 , 2016-07-12_FO_F319, 2016-07-13_FO_F320, 2016-07-14_FO_F321, 2016-07-17_FO_F322, 2016-07-18_FO_F323, 2016-07-19_FO_F324, 2016-07-20_FO_F325	IMG_08 GRI_01, GRI_02, GRI_04, GRI_10
OC4I	2016-09-17_FO_F329, 2016-09-20_FO_F330, 2016-09-21_FO_F331, 2016-09-22_FO_F332, 2016-09-27_FO_F333	IMG_05, IMG_08 GRI_01, GRI_02, GRI_04, GRI_10
OC5J	2017-08-02_FO_F425, 2017-08-03_FO_F426, 2017-08-06_FO_F427, 2017-08-07_FO_F428	IMG_08, IMG_10, IMG_11, IMG_12, IMG_13 GRI_01, GRI_02, GRI_04, GRI_10, GRI_11
OC5K	2017-09-21_FO_F432, 2017-09-26_FO_F433, 2017-09-27_FO_F434, 2017-09-28_FO_F435	IMG_13 GRI_01, GRI_02, GRI_04, GRI_10
OC6J	2018-08-22_FO_F492, 2018-08-23_FO_F493, 2018-08-24_FO_F494, 2018-08-25_FO_F495, 2018-08-28_FO_F496, 2018-08-29_FO_F497, 2018-08-30_FO_F498, 2018-08-31_FO_F499, 2018-09-06_FO_F500, 2018-09-07_FO_F501, 2018-09-08_FO_F502, 2018-09-10_FO_F503	IMG_14, IMG_15, IMG_16 GRI_01, GRI_02, GRI_04, GRI_10
OC7D	2019-07-01_FO_F588, 2019-07-02_FO_F589, 2019-07-03_FO_F590, 2019-07-04_FO_F591, 2019-07-08_FO_F592, 2019-07-09_FO_F593, 2019-07-10_FO_F594, 2019-07-11_FO_F595	IMG_17 GRI_01, GRI_02, GRI_04, GRI_10, GRI_12
OC7G	2019-10-15_FO_F622, 2019-10-16_FO_F623, 2019-10-17_FO_F624, 2019-10-18_FO_F625, 2019-10-22_FO_F627, 2019-10-23_FO_F628, 2019-10-24_FO_F629, 2019-10-25_FO_F630	IMG_17 GRI_01, GRI_02, GRI_04, GRI_10, GRI_12
OC8I	2021-04-07_FO_F713, 2021-04-08_FO_F714, 2021-04-09_FO_F715	IMG_18 GRI_01, GRI_02, GRI_04, GRI_10, GRI_12

FORCAST SERIES		
SERIES	**MISSION ID**	**ISSUES**
OC8O	2021-06-23_FO_F751, 2021-06-30_FO_F752, 2021-07-01_FO_F753, 2021-07-02_FO_F754	IMG_18 GRI_01, GRI_02, GRI_04, GRI_10, GRI_12
OC9A	2021-07-07_FO_F755, 2021-07-08_FO_F756, 2021-07-09_FO_F757	IMG_18 GRI_01, GRI_02, GRI_04, GRI_10, GRI_12

FLITECAM SERIES		
SERIES	**MISSION ID**	**ISSUES**
OC2A	2014-02-19_FP_F146, 2014-02-20_FP_F147, 2014-02-25_FP_F148, 2014-02-27_FP_F149	FPIMG_01 FPGRI_01, FPGRI_02
OC3E	2015-06-28_FP_F222, 2015-06-29_FP_F223	FPIMG_01 FPGRI_01
OC3J	2015-09-29_FC_F243, 2015-10-01_FC_F244, 2015-10-02_FC_F245	

FIFI-LS SERIES		
SERIES	**MISSION ID**	**ISSUES**
ALL	ALL	FIFI_01, FIFI_02, FIFI_03
OC8B	2020-08-18_FI_F676, 2020-08-20_FI_F677, 2020-08-28_FI_F678, 2020-09-01_FI_F679, 2020-09-02_FI_F680, 2020-09-03_FI_F681, 2020-09-04_FI_F682	FIFI_04

Table 1: Details of known issues for HAWC

MODE	ISSUES	SERIES
*[1]	[HALISS_01a] **Dark Outlines:** When observing very bright extended sources with little sky background, dark areas appear to outline the bright emission.	All
	[HALISS_01b] **Intermittent Artifacts:** Occasionally artifacts seen as dark regions off-source or dark spots appear on the array due to insufficient mapping coverage.	All
Imaging	[HAIMG_01] **Ghosting:** Streaks and false sources in data due to very bright targets, can resemble chop smear.	OC4L, OC5E, OC5N
Polarim.	[HAPOL_01] **Chop Smear:** Smearing due to observations being taken while chopping secondary still moving. Causing streaking and false sources above and below bright objects.	OC5E, OC5N
	[HAPOL_02] **Nod Misalignment:** A mechanical issue associated with the telescope has resulted in misalignment or imperfect matching of the Nods in HAWC Chop-Nod mode (C2N(NMC)) mode with large Nod Throws≥120 arcsec). This has resulted in double sources with misalignments on scales greater than 3 arcsec (more at larger Nod Throws). This primarily affects polarimetry mode where Chopping and Nodding are used rather than a Lissajous pattern.	OC4L, OC5E, OC5N
	[HAPOL_03] **Helium Contamination:** Helium contamination on the detector caused time variable phase shifts of $\sim$ 30 degrees at 10 Hz. This only occurred on 2016-12-06_HA_F355.	OC4L* [*FT355 only]
	[HAPOL_04] **Flux Calibration:** This series had a few cancelled and postponed flight resulting in low numbers of standard star observations and all observations below altitude of 39K. This resulted in reference flux calibration values that were considerable off compared to the historic data. Therefore, this series has been calibrated with an average values derived from historic data.	OC9E

[1]These issues occur using the scanning Lissajous mode which is currently only used for imaging but may be used for scanning polarimetry in the future.

Table 2: Details of known issues for FORCAST

MODE	ISSUES	SERIES
Imaging	[IMG_01] **Smearing due to incorrect chop settle time (F108, F109):** For some of the observations on flights 108 and 109, the chop settle time was set incorrectly resulting in some chop smear in the images; see QA notes for further information.	OC1B
	[IMG_02] **Flaring in observations using Barr #3 dichroic:** Some of the observations taken with the Barr #3 dichroic suffered from significant flaring (the Barr #3 has since been discontinued). Affected observations are indicated in the AOR QA notes.	OC1B
	[IMG_03] **Elongated PSF:** The PSF is significantly elongated in the cross- elevation direction. This is due to telescope jitter; efforts are being taken to improve it for future observations. The axis ratio of point sources is typically 1.3.	OC1B, OC1DF
	[IMG_04A] **WCS Incorrect (A):** The WCS solution provided with the data is inaccurate because the secondary mirror offsets are not accounted for correctly yet. Errors are of order the chop/nod amplitude: typically 30" in NMC mode, and as much as 200–400" for C2NC2 mode.	OC1B, OC1DF, OC2B, OC2D, OC2F
	[IMG_04B] **WCS Incorrect (B):** For NMC mode, the WCS solution provided with the data has been corrected using the requested coordinates (OBSRA/OBSDEC) and is likely to be correct. However, since there is no way to independently verify, the quality of the WCS is still marked as UNKNOWN, and hence the WCS should be used with some caution. For C2NC2 mode, the WCS quality is marked as PROBLEM and is likely to be inaccurate by as much as 200–400".	OC2H, OC3C, OC3D

Table 2: Details of known issues for FORCAST

MODE	ISSUES	SERIES
Imaging	[IMG_04C] **WCS Incorrect (C):** For C2NC2 mode the WCS quality is marked as PROBLEM and is likely to be inaccurate by as much as 200–400". The WCS solution provided with the raw data for NMC and NXCAC modes is now accurate to within 10" (though may have WCS quality marked as UNKNOWN).	OC3I, OC3L
	[IMG_04D] **WCS Incorrect (D):** The WCS for all modes is now accurate to within 10" or better.	OC4A
	[IMG_05] **Mis-matched Chop/Nods:** When the chop and nod amplitudes are not quite matched for FORCAST NMC data, directly stacking the frames results in an elongated or doubled central source that may not be useful for science. However, shifting the frame before stacking causes mismatches in the background structure, which results in strong artifacts in the background of the image.	OC2H, OC3C, OC3D, OC3I, OC3L, OC4A, OC4I
	[IMG_06] **Vignetting:** A number of observations from OC2D suffered from telescope vignetting. If an observation was potentially vignetted, the LEVEL 3 (flux calibrated) file will have the following HISTORY record in the FITS header: *HISTORY Vignetted, calibration is uncertain!*	OC2D, OC2F
	[IMG_07] **Bad Corner Pixels:** There is a bad pixel cluster in the LWC channel of the FORCAST array in the upper right corner that has recently gotten worse. This has no effect on the rest of the data in the image, but can cause problems with auto scaling in image display tools (e.g. ds9) and in mosaicking.	OC3L
	[IMG_08] **Minor issue with droop correction in LWC:** Observations taken in the LWC short wavelength filters (8.6, 11.3, 11.8, and 24.2 mic.) show minor artifacts close to bright sources due to small errors in the Droop Correction parameters. Most science observations are not affected by this issue. The parameters will be updated in a future pipeline release	OC2H, OC3C, OC3D, OC3I, OC3L, OC4A, OC4G, OC4I
	[IMG_09] **UTCSTART Keyword for C2NC2 Mode:** The value for UTCSTART in the FITS headers for observations obtained in the C2NC2 mode is likely to be incorrect by up to $\sim$ 1 min.	OC1B, OC1DF, OC2B, OC2D, OC2F, OC2H, OC3C, OC3D, OC3I, OC3L, OC4A
	[IMG_10] **Smearing due to sky rotation:** Possible smearing at edges of imaging data in some filters for long exposures with large rotations on sky. This is due to small inaccuracies in boresite definition (center of rotation) during rotation step while coadding (COA/CAL files).	OC1B, OC1DF, OC2B, OC2D, OC2F, OC2H, OC3C, OC3D, OC3I, OC3L, OC4A
	[IMG_11] **Incorrect boresite:** Boresite was setup incorrectly causing errors in the WCS. These were updated manually where possible using WISE. 2MASS, or UCAC4 positions in the final COA and CAL files.	OC5J

Table 2: Details of known issues for FORCAST

MODE	ISSUES	SERIES
Imaging	[IMG_12] **Poor Nod subtraction:** Excess noise is seen as a ripple effect in the background in the 19.7 micron filter (FOR_F197) due to poor NOD subtraction. Dithering alleviated most of the problem but still resulted in poorer than normal background subtraction.	OC5J
	[IMG_13] **Nod Misalignment:** A mechanical issue associated with the telescope has resulted in misalignment or imperfect matching of the Nods in one FORCAST mode (NMC mode with large Nod Throws≥120 arcsec). This has resulted in double sources with misalignments on scales of 3-5 arcsec. Only data showing header keywords containing NODSTYLE=NMC and NODAMP≥120 are affected.	OC5J, OC5K
	[IMG_14] **Window Degradation:** Degradation of the FORCAST entrance window resulted in poor background subtraction and artifacts that could not be removed by the pipeline. Calibration factors in the SWC are substantially different (by ∼35%) from those derived from previous cycles. Data files are marked as USABLE and observers are cautioned that ancillary data maybe required to assess the calibration accuracy. The LWC was also affected and both channels saw variable backgrounds with streaks and large bright and dark areas.	OC6J
	[IMG_15] **Array Debris:** String-like artifact on the FORCAST short wavelength camera (SWC) array is prominent in data with insufficient dithering. Pipeline was unable to remove this artifact with a custom bad pixel mask due to strong variations in the background due to the degradation of the entrance window.	
	[IMG_16] **Distortion:** Possibly due to the degradation of the entrance window in Cycle OC6J, images appear to be distorted with the distortion gradually increasing with distance from the center of the array. This distortion is beyond what is regularly being corrected by the pipeline.	
	[IMG_17] **Window:** New entrance window greatly improved the background noise as compared to OC6J, but still suffered from some structure seen as arcs of positive and/or negative emission at the very edges of the array.	OC7D, OC7G
	[IMG_18] **Debris:** Some debris has fallen onto the FORCAST array resulting in larger than normal NaN regions in the bad pixel masks. Dithering was added to programs to remove this effect from the data, but it still may be seen in single non-dithered images and acquisitions.	OC8I, OC8O, OC9A

Table 2: Details of known issues for FORCAST

MODE	ISSUES	SERIES
Grism	[GRI_01] **Ghosting in G6:** Currently the G6 grism suffers from significant ghosting for bright sources, which shows up as a faint spectrum just above the main source in the 2-d image. Furthermore, analysis of both stellar and asteroid response curves (i.e. red and blue) indicates that if there is an effect on the flux calibration, it must be less than 5%.	ALL except OC1B & OC1DF
	[GRI_02] **Cross-correlation artifacts:** Some FORCAST grism spectra may show very low-level artifacts due to small wavelength shifts between the observation data and the telluric model incurred by slight inaccuracies in the cross-correlation. To verify whether a feature is an artifact or not, download the MRG file for the observation (which is not shifted) and divide by the telluric spectrum and response curve in the original L3 file. Comparing this result to the original L3 spectrum should reveal which features are artifacts due to anomalous shifts.	ALL
	[GRI_03] **Telluric correction:** All FORCAST spectra should be compared to the telluric model spectrum to identify possible artifacts (e.g. "P Cygni" lines) due to a mis-match between the true PWV and what is assumed for the telluric model. This issue is mitigated for reprocessed data (with SNR $>$ 10) from cycle 2, 3 and 4.	OC1B, OC1DF
	[GRI_04] **Edge Artifact:** This artifact is observed in FOR_G063 and FOR_G111 grisms. In the 2D image of FOR_G063, it manifests as a small ($\approx$ 5 pixel) bright dot close to the PSF of the source. This results in enhancement of flux in the first 5 pixels (i.e for wavelengths $<$ 5.5 μm) of the spectra. A similar effect is seen in FOR_G111 but instead of enhancement of flux, a drop in the flux is seen for the last 5 pixels (i.e. wavelengths $>$ 13.5 μm). It is recommended that the users should determine if their data is affected by this artifact and if the edges of the spectra should be excluded from analysis.	ALL
	[GRI_05] **Bad blocker for grism G6:** Due to a bad blocker filter, observations with the G6 grism (FOR_G329) have significant contamination from other orders. These observations have not been processed further and should not be used for science. A new blocking filter has been installed for Observing Cycle 2 to address this issue.	OC1B, OC1DF
	[GRI_06] **G4xG3 Ghosting:** Any data taken in the G4xG3 cross-dispersed mode are significantly contaminated by ghost images and should not be used for science. There are lower-level ghosts in the G1 and G3 spectra, especially for bright sources.	OC1B, OC1DF
	[GRI_07] **G3 wavecal issue (minor):** The wavelength calibration for the G3 grism (FOR_G111) is off by a little over a pixel near 12.8 microns.	OC1B, OC1DF
	[GRI_08] **B Beam not extracted in some cases:** Due to an error in the nodding specification, the negative ("B") beam in some observations was too faint to extract. In these cases, only the positive ("A") beam was extracted.	OC2B
	[GRI_09] **Wavelength calibration for FOR_XG063:** Currently the wavelength solution for the G2xG1 mode (FOR_XG063) in the highest orders is extrapolated due to lack of suitable reference lines. Initial testing indicates that the current wavelength solution may be off by 3–4 pixels for wavelengths shorter than 5.7 microns	OC2H, OC3C, OC3D
	[GRI_10] **First Frame Artifact:** Two dark structures are seen on the right side of the array for grisms FOR_G227 and FOR_G329. This only occurs in the first frame of a set and disappears by the second frame. This may be due to a settling of the array temperature when changing frametimes, though the exact cause is not known.The effect is small and mostly inconsequential for bright objects, however it may cause significant issues due to noise in the background region for the faint spectra.	ALL except OC1B & OC1DF
	[GRI_11] **Nod Misalignment:** A mechanical issue associated with the telescope has resulted in misalignment or imperfect matching of the Nods in one FORCAST mode (NMC mode with large Nod Throws$\geq$120 arcsec). This can result in double instances of the source and/or the source being slightly out of the slit in one Nod beam. Only data showing header keywords containing NODSTYLE=NMC and NODAMP$\geq$120 are affected. This mode was only used with one source on FT428	OC5J

Table 2: Details of known issues for FORCAST

MODE	ISSUES	SERIES
	[GRI_12] **Wavelength Calibration:** The wavelength calibration for the G111 grism is uncertain due to changes in the instrument and the unavailability of valid calibration files. Users are cautioned that the reduced spectra for this grisms may exhibit spurious emission and absorption features, due to the misalignment of the telluric absorption features in wavelength. The spectra will be re-reduced and re-calibrated in the future when accurate wavelength calibration files are available.	OC7D & OC7G

Table 3: Details of known issues for FLITECAM

MODE	ISSUES	SERIES
Imaging	[FPIMG_01] **Optical distortion not corrected:** Optical distortion has not been measured/corrected. Uncertainty in the WCS solution is 0.7" near the reference pixel (CRPIX1/2) and ∼3" near the frame edge.	OC2A, OC3E, OC3J
Grism	[FPGRI_01] **No grism flatfield:** A suitable flat field has not been derived for wavelengths shortward of 2 microns. In addition, the spectra cross a region of low QE that is difficult to correct for in the flat fielding procedure at longer wavelengths. Consequently, we have opted not to combine the "A" and "B" beam spectra for observations that were nodded along the slit. In these cases, the data for each "beam" are stored as separate apertures in the final, combined spectrum file. See the GI Handbook for FLITECAM data for a description of how the data from each aperture are stored.	OC2A, OC3E, OC3J
	[FPGRI_02] **Cannot process 1" slit grism observations:** Grism observations using the 1" slit currently cannot be processed due to lack of sufficient calibration data. As soon as the needed calibration data are available, these datasets will be processed and distributed.	OC2A

Table 4: Details of known issues for FIFI-LS

MODE	ISSUES	SERIES
ALL	[FIFI_01] **Telluric correction:** All FIFI-LS spectra should be compared to the telluric model spectrum to identify possible artifacts (e.g. "P Cygni" lines) due to a mis-match between the true PWV and what is assumed for the telluric model.	ALL
	[FIFI_02] **Re-sampling:** The processing re-samples the raw data onto a regular wavelength and spatial grid. The re-sampling can create artifacts if there is not good sampling or at the edges (in both wavelength and spatial maps). The GI should contact the SSC if he/she believes there are processing artifacts present in his/her data products.	ALL
	[FIFI_03] **Masking:** The projection in the final cube are masked to avoid having interpolated values where no data have been taken. The GI should be aware that the projections in the "Uncorrected" flux data have not been masked in the current version of the pipeline.	ALL
Blue Channel	[FIFI_04] **Blue Channel:** For flights 676 and 677, an issue with the instrument electronics caused the data from the blue channel to have much higher noise than usual. Blue channel data from these flights are marked as "PROBLEM" and should not be used for science. The blue channel was turned off for the remaining flights of the series.	OC8B