67P Polarimetry

EARTH_BASED Rosetta Science Archive Review
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Michael S. P. Kelley
University of Maryland

RID 112 - HST data description and analysis is missing from the EAICD

Description of Discrepancy: The EAICD indicates the STScI website should be referred to, but this is insufficient for archiving standards.

Recommended Solution: Provide suitable descriptions of the HST data and the reduction steps applied to generate the reduced (level 3) data.

113 - Telescope and instrument names in labels

Description of Discrepancy: In all data labels, the telescope ID includes the name of the instrument. Instead, it must be limited to the telescope to facilitate searching between data sets. In addition, if PDS or PSA has already archived data from any of these telescopes, the appropriate ID should be used. The current values in the data set are:

TELESCOPE_ID = "BNAO-ROZHEN-FORERO2"
TELESCOPE_ID = "ESO-VLT-U1-FORS2"
TELESCOPE_ID = "HST-ACS-WFC"
TELESCOPE_ID = "SAO-RAS-BTA-SCORPIO2"
TELESCOPE_ID = "WHT-ISIS"

113 - Telescope and instrument names in labels

Description of Discrepancy, continued: Furthermore, the instrument name should be moved to the INSTRUMENT_NAME field, and a PDS or PSA compliant INSTRUMENT_ID used or generated. The current values are identical for all data:

INSTRUMENT_ID = "POL"
INSTRUMENT_NAME = "POLARIMETRY"

Recommended Solution: Consult with PDS and PSA about the appropriate IDs for the telescopes and instruments, and correct all data labels.

114 - Invalid Keyword Values

Description of Discrepancy: Some label values are invalid, including all uses of NULL. The following should be updated:

STOP_TIME is NULL but observation stop times should be used. For example, the HST ACS pipeline does estimate the observation stop time. For instruments without stop times, should START_TIME + EXPOSURE_DURATION be used?

RIGHT_ASCENSION, DECLINATION: Some labels have values of NULL but comments to see the file header. Instead the values should be copied to the labels.

114 - Invalid Keyword Values

Description of Discrepancy, continued:

COORDINATE_SYSTEM_ID is "NULL", "FK5 2000", or "J2000". Only J2000 is valid. The others should be updated to valid values. EQUINOX_EPOCH should be added, as needed for COORDINATE_SYSTEM_ID.

AIRMASS = "NULL" for some labels. If not already computed, it can be estimated from RA, Dec, observatory location, and time.

116 - Time unit: seconds

Description of Discrepancy: The use of <SEC> for a time unit does not appear to be valid according to the PDS standards.

Recommended Solution: <SEC> should use the SI abbreviation <S>.

119 - Missing basic imaging and spectroscopy keywords

Description of Discrepancy: Several basic image keywords are missing: HORIZONTAL_PIXEL_SCALE, VERTICAL_PIXEL_SCALE, CELESTIAL_NORTH_CLOCK_ANGLE, SAMPLE_DISPLAY_DIRECTION, LINE_DISPLAY_DIRECTION, FILTER_NAME.

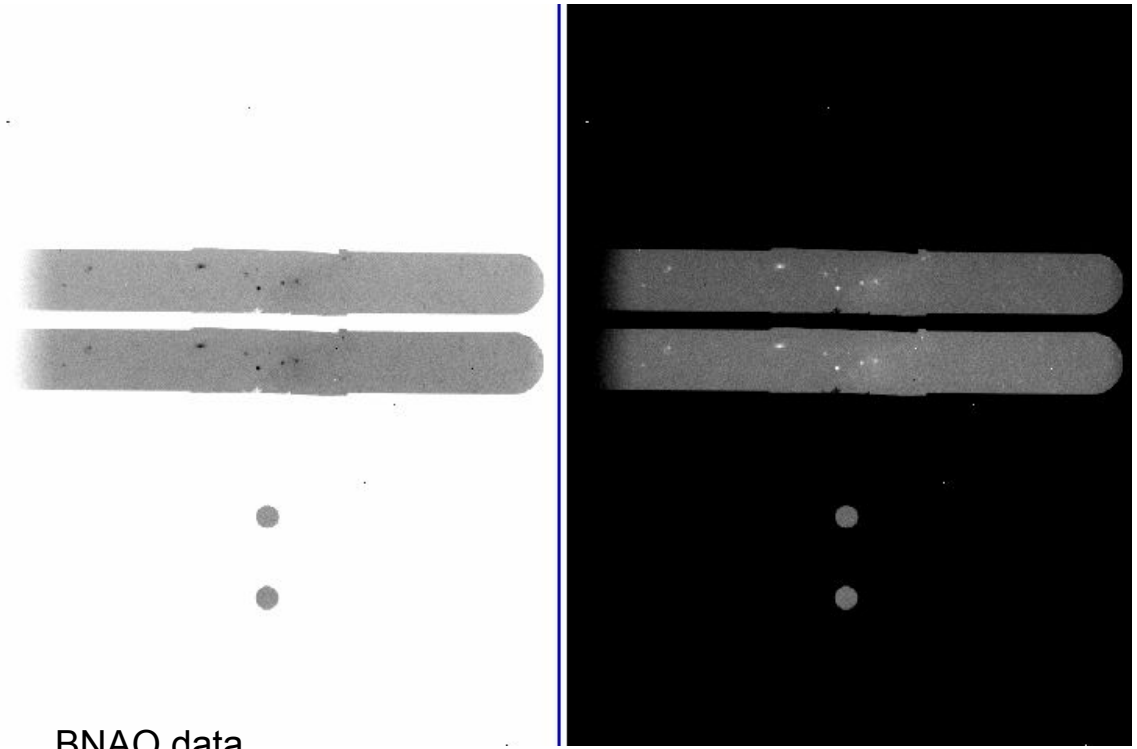
The BTA spectra are missing similar spectroscopic keywords.

Recommended Solution: Add the missing keywords. Check with PSA or PDS about spectral keywords for BTA spectroscopy.

122 - Incorrect data object descriptions

Description of Discrepancy: Image objects indicate the data are 16-bit IEEE_REAL (i.e., floating point) but the FITS headers have BITPIX=16, meaning 16-bit integers. Moreover, the FITS headers have a BZERO of 32768 (i.e., a data value offset). These discrepancies cause reading the data using the PDS label to return the wrong data values.

Recommended Solution: Make sure the PDS label correctly describes the data as intended.



BNAO data.

123 - BNAO documentation does not describe the data

Description of Discrepancy: The document states that two Wollaston prisms are used to split the incoming light into four small approximately square images. But the data instead show two sub-images and two tiny circles.

Recommended Solution: Additional documentation should be provided that correctly describe the images in the data set.

123 - BNAO documentation does not describe the data

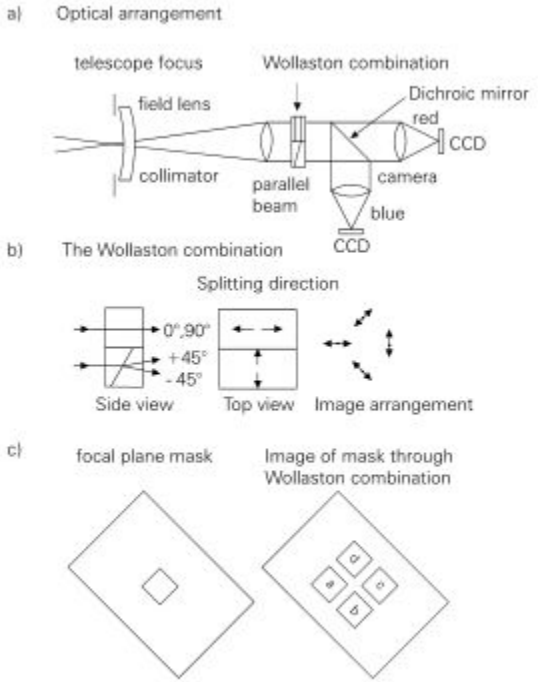
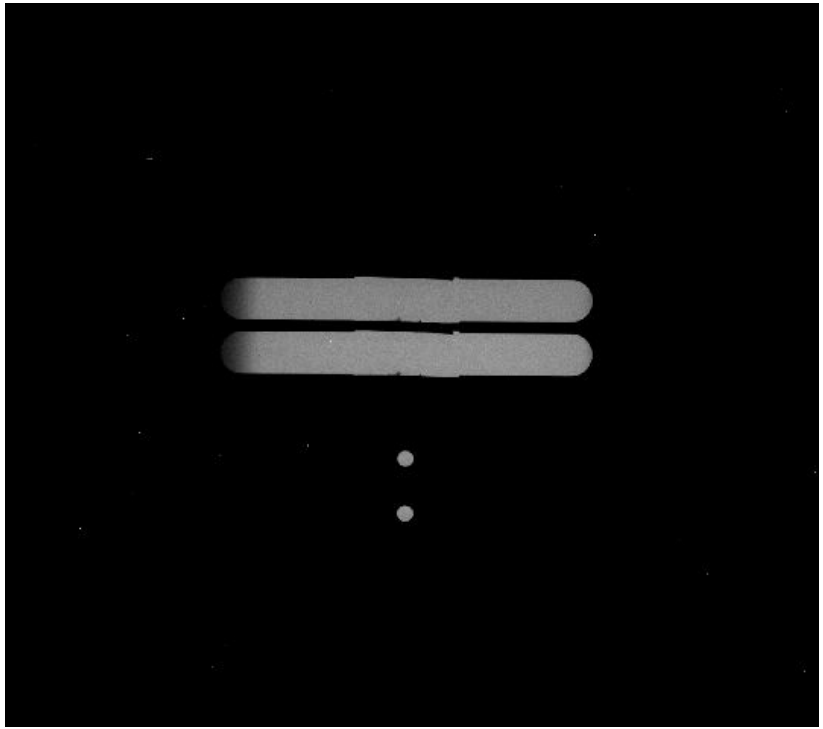


Figure 2: Optical scheme of the Two-Channel Focal Reducer in polarimetric mode.



124 - Polarization state descriptions missing

Description of Discrepancy: The waveplate orientation is not in the PDS label or FITS header for BNAO data.

For HST, there is no data description at all.

For BTA, the documentation indicates data may be taken with a half-waveplate or a quarter-waveplate. The PDS documentation does not indicate which is used, or the waveplate orientation.

Similar comments for the others.

124 - Polarization state descriptions missing

Recommended Solution: Since PDS3 does not have the appropriate polarimetry keywords, the best solution is a documentation table that lists the waveplate used, and its orientation for each file. For HST, it is the polarizer that should be documented.

Perhaps FILTER_NAME can be used? Contact PDS or PSA for guidance.

127 - HST data not fully labeled and documented

Description of Discrepancy: There are additional headers in the raw HST data that are not described in the PDS label or documentation. The extension names suggest error and data quality flags are included, but the corresponding images are missing. However, without the documentation, a user does not know if these headers should have been deleted, or if the data was deleted by mistake.

For the reduced data, there are four additional images and one table, but they are not labeled or documented.

Recommended Solution: Fully label and document the HST data. Add the missing data to the raw FITS files. Add a description of the steps performed on the HST data to arrive at the calibrated data set.