

Rosetta NavCam Calibrated Data Ext1 MTP026

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Overview

- Dataset: ro-c-navcam-3-ext1-mtp026-v1.0
- NavCam images during the extended phase 1, collected from 2016-02-09T23:25:00 to 2016-03-08T23:25:00
- Radiometrically calibrated, pixel artifacts fixed, vignetting corrected
- 819 images total, all from NavCam1

- Overall a clean dataset, easy to review
- Some problems found, including major ones, but all should be easy fix

Wrong SAMPLE_TYPE

- The SAMPLE_TYPE key in all label files has a wrong value of “IEEE_REAL”
 - Cannot be recognized by IDL readpds.pro, which can read in images without reporting error, but the loaded images have wrong values in all pixels
 - This probably doesn't comply with PDS3 standards?
 - After manually corrected to “PC_REAL”, images can be loaded by readpds.pro correctly
 - Images can also be loaded with my own Python code

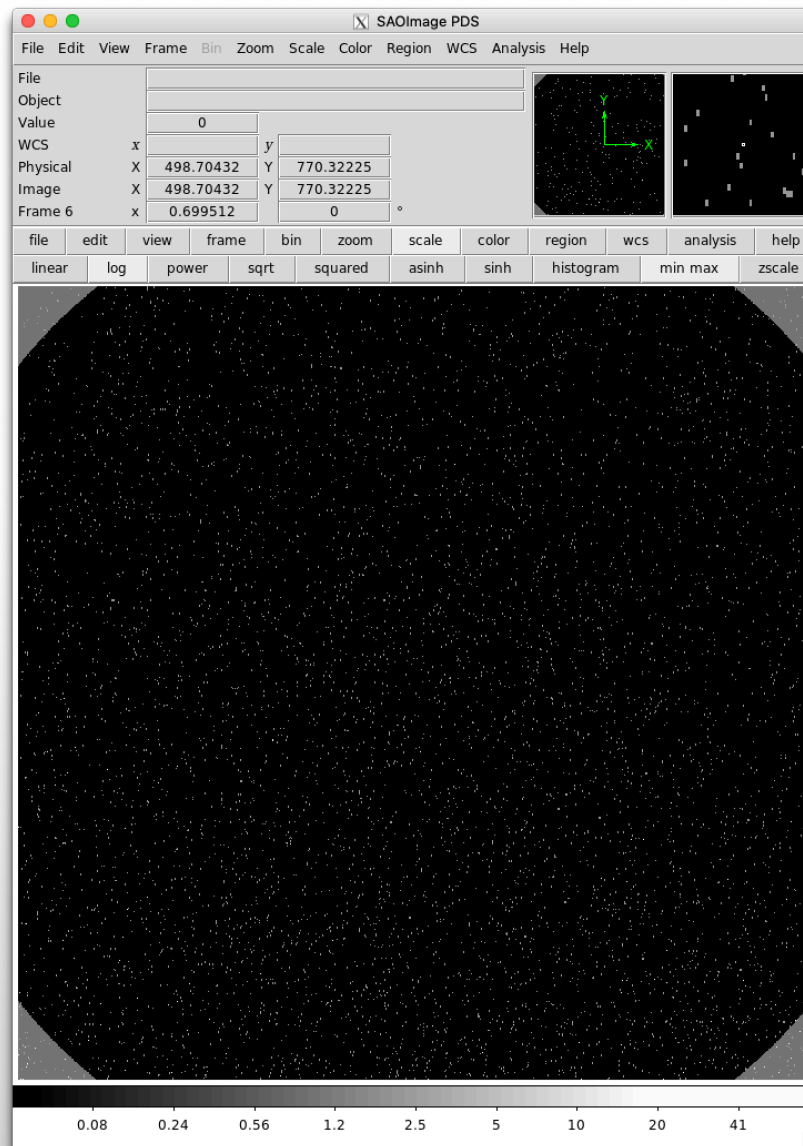
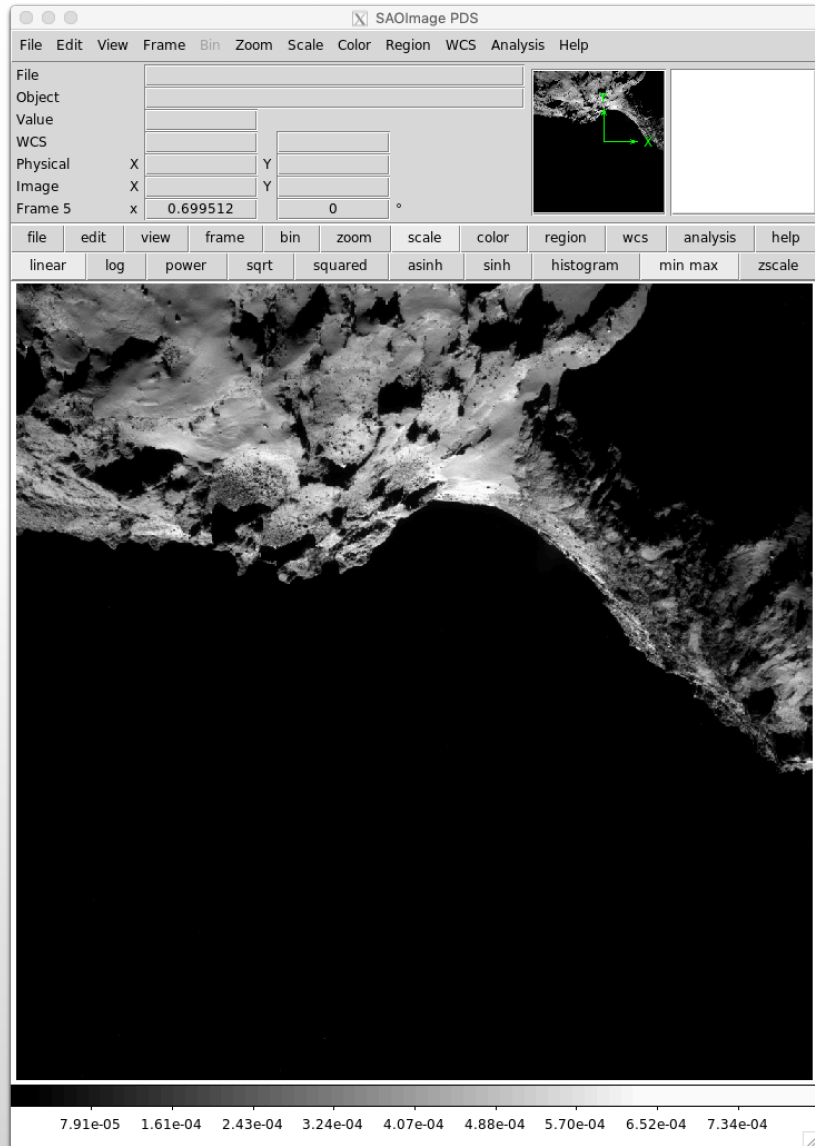
```
109  OBJECT                      = IMAGE
110      DERIVED_MAXIMUM          = 0.00111212977208
111      DERIVED_MINIMUM          = -1.34881829581e-05
112      LINES                     = 1024
113      LINE_SAMPLES              = 1024
114      SAMPLE_TYPE               = "IEEE_REAL"
115      SAMPLE_BITS               = 32
116      UNIT                      = "W/(m**2*s*r*nm)"
117      SOURCE_SAMPLE_BITS        = 12
118      SAMPLE_DISPLAY_DIRECTION  = "RIGHT"
119      LINE_DISPLAY_DIRECTION    = "UP"
120  END_OBJECT                   = IMAGE
```

Missing display orientation for quality images

```
108
109 OBJECT                = IMAGE
110   DERIVED_MAXIMUM      = 0.00111212977208
111   DERIVED_MINIMUM      = -1.34881829581e-05
112   LINES                = 1024
113   LINE_SAMPLES         = 1024
114   SAMPLE_TYPE          = "IEEE_REAL"
115   SAMPLE_BITS          = 32
116   UNIT                 = "W/(m**2*s*r*nm)"
117   SOURCE_SAMPLE_BITS   = 12
118   SAMPLE_DISPLAY_DIRECTION = "RIGHT"
119   LINE_DISPLAY_DIRECTION = "UP"
120 END_OBJECT            = IMAGE
121
122 OBJECT                = EXT_QUALITY_FLAGS_IMAGE
123   LINES                = 1024
124   LINE_SAMPLES         = 1024
125   SAMPLE_TYPE          = "MSB_UNSIGNED_INTEGER"
126   SAMPLE_BITS          = 8
127   DESCRIPTION          = ""
128   For each pixel, the bit values in the quality map give information about the
129   processing steps applied. The significance of bit values set to 1 is:
130   bit 0  vignetting correction applied
131   bit 1  pixel-pair artefact correction applied (average)
132   bit 2  pixel-pair artefact correction applied (interpolation)
133   bit 3  warm pixel correction applied (interpolation)
134   bit 4  negative value after bias subtraction and smear correction
135   bit 5  pixel was saturated in raw data (i.e. DN=4095 in Level 2 product)
136   bit 6  bad pixel belonging to the bottom row of a full-frame image
137   bit 7  missing information in telemetry data (i.e. DN=0 in Level 2 product)
138   "
139 END_OBJECT            = EXT_QUALITY_FLAGS_IMAGE
140 END
```

- The SAMPLE_DISPLAY_DIRECTION and LINE_DISPLAY_DIRECTION are present for the IMAGE object, but missing for all EXT_QUALITY_FLAGS_IMAGE object

Otherwise all images load well and displayed well



- Manually correct `SAMPLE_TYPE` for `readpds.pro`, or ignore it with my own Python code, then images can be loaded and displayed well
- Example image `ros_cam1_20160223t131104c` shown here
- Data on the left, quality image on the right
- Both looks nominal, with reasonable values in the pixels
- All images in `extras/` directory are exactly the same as those in `data/` directory

Geometric information

- Loaded SPICE kernels to calculate the geometric parameters of all images
- Good match for all except for sub-s/c coordinates, for which I cannot correctly load the comet attitude kernels CATT....bc, no idea why

Other minor problems

- In dataset.cat:
 - Lines 84, 89-92, 97, 102-105, 111, 116-119: The naming conventions described here are not entirely consistent with the description in the interface control document, or the actual file names
 - Character “T” is used here in date-time string, but “t” is used in actual file names
 - Trailing “c” and “q” are not explained here
 - Trailing “F” is inconsistent with the actual case
 - Line 126-147: Suggest using exactly the same keywords as in the label file here when explain them. The keywords explained here omit the underscores connecting separate words in the keywords
 - Line 155: DATA_QUALITY key described here is not found in any label file
 - Line 167: The name of mission phase “Escort Phase” is not consistent with the text earlier (line 27) “Extension 1 Phase”. Based on mission.cat, the extension phase is not part of escort phase.
- Label files missing for data files in calib/
- File name mismatch: actual file name “ro-sgs-if-0001.asc”, but inside the interface control file the file name is written as “ro-sgs-if-0001.txt”