

PDS/SBN Data Review

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MRI Raw and Calibrated Data of C/Garradd

Summary

- MRI images of Comet C/Garradd collected from Feb 20 to Apr 9, 2012
- Comet was 1.74 AU to 2.11 AU from the Sun, and 1.88 AU to 1.30 AU from the D1 flyby spacecraft
- Raw (level-2) and calibrated (level 3/4) have similar dataset and storage structures
- Datasets include all required components, well documented with clearly written documents. No major issues identified

Catalog Files

- Checked dataset.cat:
 - Line 167/234: “This extension uses *one byte of eight (,) bit flags* to ...” not clear to me.
 - Line 255/334: The table doesn't seem to be aligned

| | | | | | | |
|-----|--|-----------|--------|--------|------|----------------------|
| 253 | | | X-Size | Y-Size | Bin | |
| 254 | | Mode Name | (pix) | (pix) | Type | Comments |
| 255 | | | | | | |
| 256 | | 3 SF2S | 256 | 256 | | Sub-frame, shuttered |
| 257 | | | | | | |

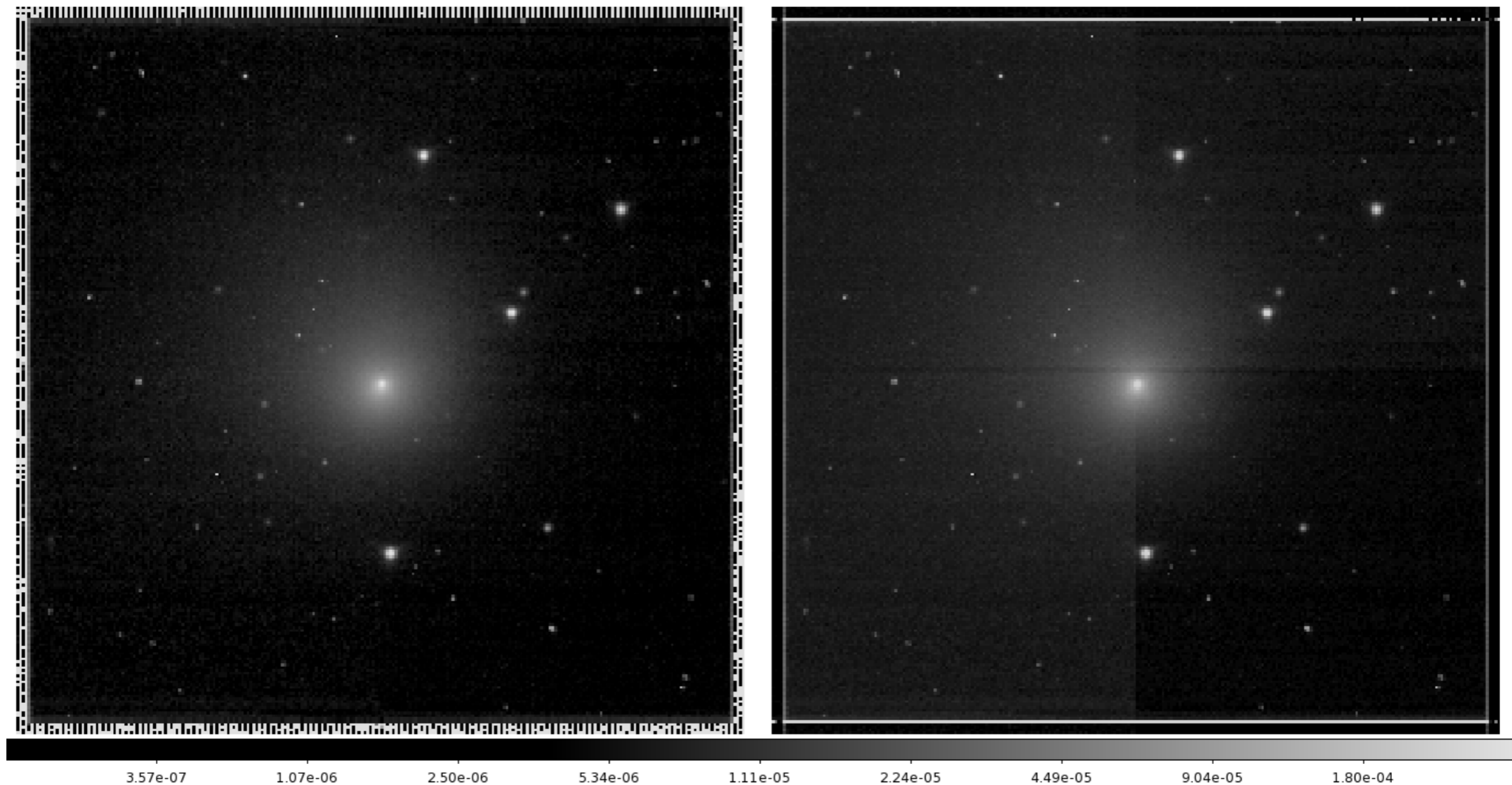
- Explanation of x-size for the table: “X-size is the *Spectral* dimension” is wrong
- Line 273/351, in the table listing filters: Center wavelength of CLEAR6 is 650 nm not 600 nm
- Did not check other catalog files

Documents

- mri_2/3_4_epoxi_garradd.lbl:
 - Line 68/71: Specified format for column 2 is not consistent with Julian date
 - Line 96/99: Confusing sentence: *If the target was within several fields-of-view, the actual target name was used although the target may not be in the image.*
 - Line 126/129: typo: delete “this”
 - Line 279/282: Center wavelength for CLEAR6 is 650 nm not 600 nm
 - Suggest to remove all columns that have the same values or N/A for all images, including COMPRESSED_IMAGE_VALUE, MISSION_PHASE_NAME, MISSION_ACTIVITY_TYPE, OBSERVATION_DESC, SUB_SPACECRAFT/SOLAR_LONGITUDE/LATITUDE, BODY_POSITIVE_POLE_CLOCK_ANGLE

Images

Image ID: mv12022019_4010000_001

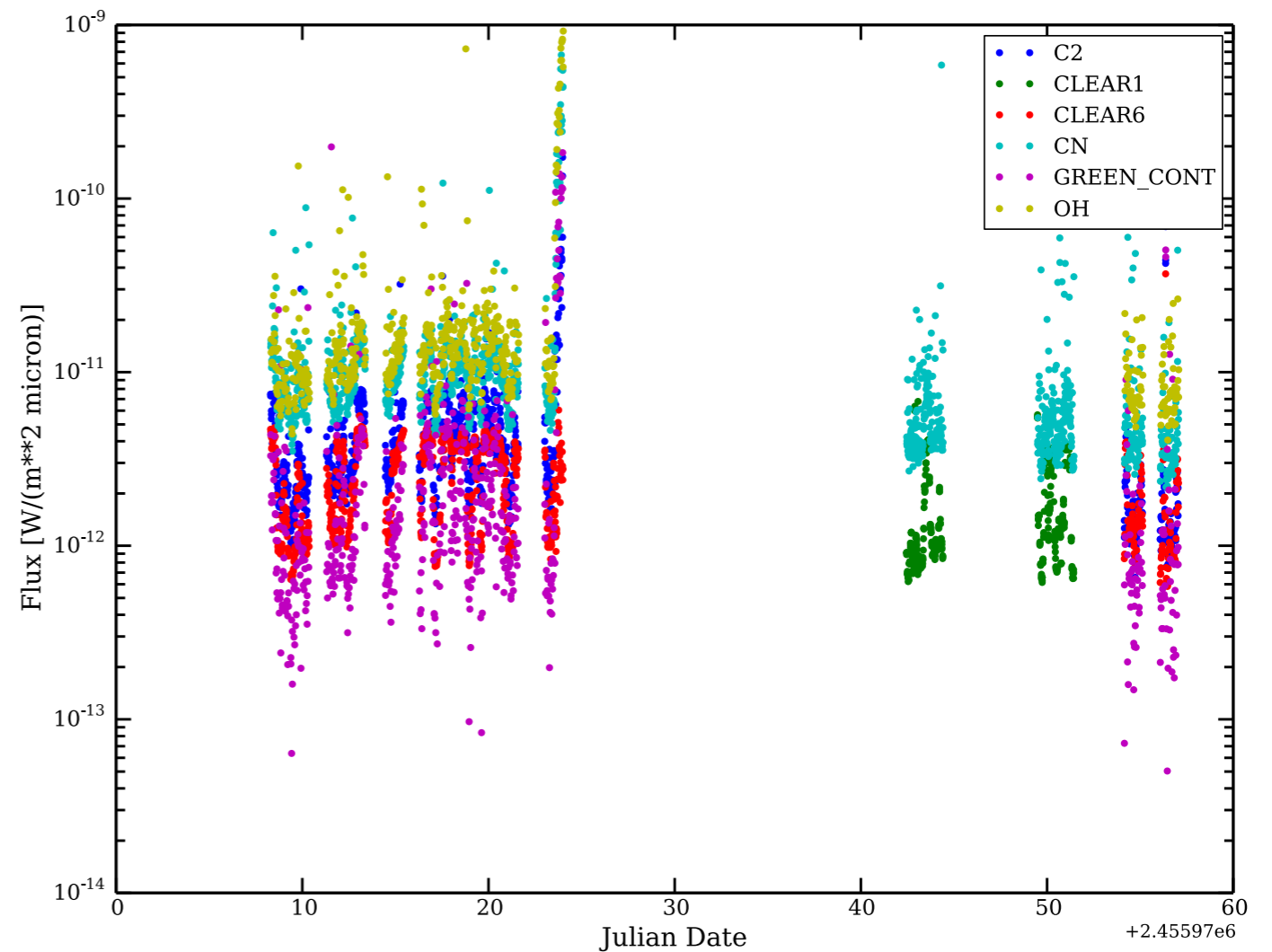


calibrated

raw

Quick Photometry

- Quick centroid at ± 10 pixels from image center
- Quick photometry with 5-pixel aperture
- Automated for all images
- Lightcurve very noisy - my problem
- Flux level reasonable



Recommendation

- Good and useful datasets that should be archived by PDS/SBN
- Need to correct for the minor problems identified here
- Certified

MRI Raw and Calibrated Data of C/ISON

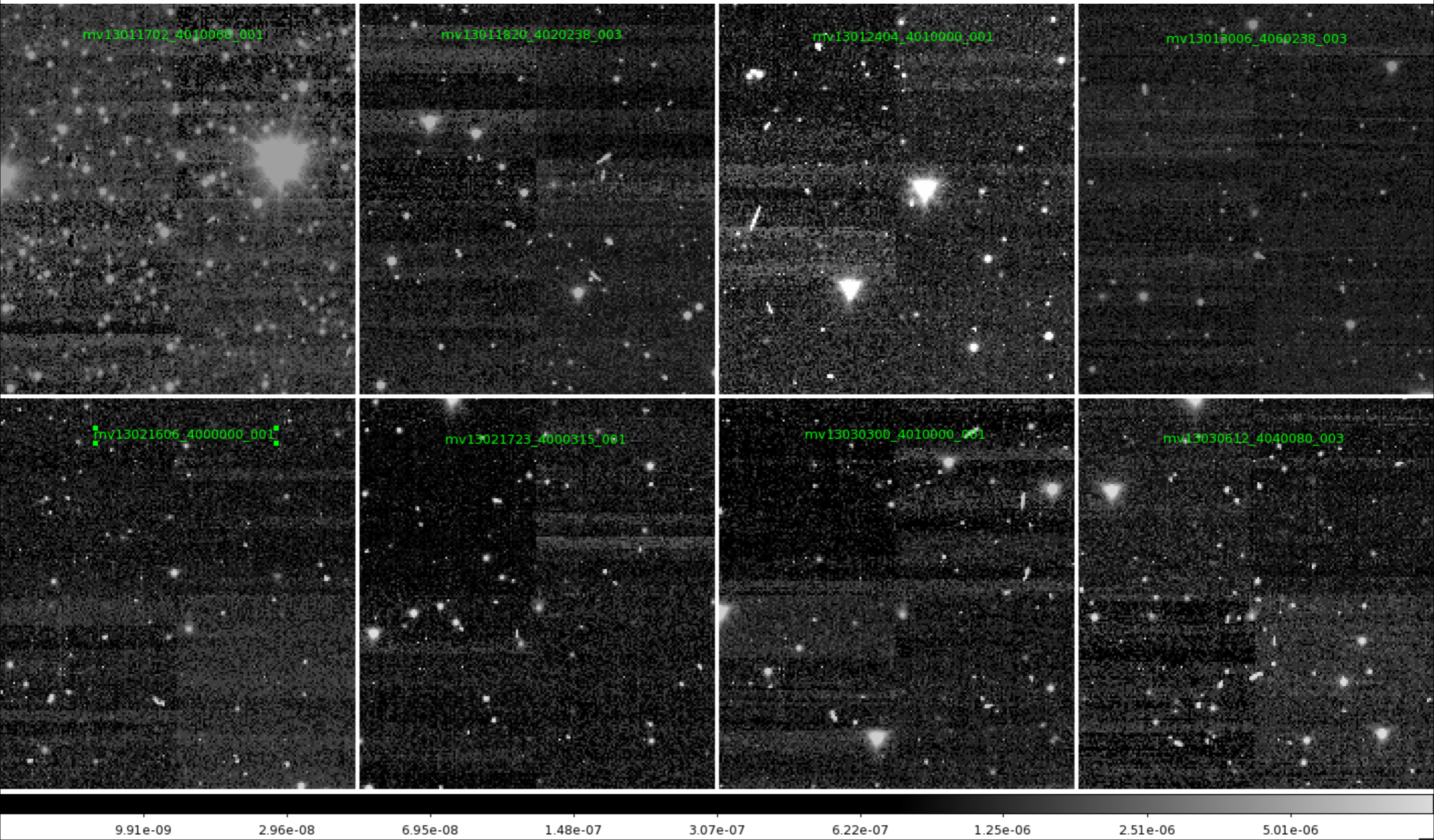
Summary

- MRI images of Comet C/ISON collected from Jan 17 to Mar 6, 2013
- Comet was 5.09 AU to 4.55 AU from the Sun, and 5.28 AU to 3.96 AU from the D1 flyby spacecraft
- Raw (level-2) and calibrated (level 3/4) have similar dataset and storage structures
- Datasets include all required components, well documented with clearly written documents. No major issues identified

Catalog Files

- Almost identical catalog files with C/Garradd datasets
- All problems identified for C/Garradd datasets applicable here
- Did not check other catalog files

Images - Where is C/ISON?



Recommendation

- Good and useful datasets that should be archived by PDS/SBN
- Need to correct for the minor problems identified here
- Certified

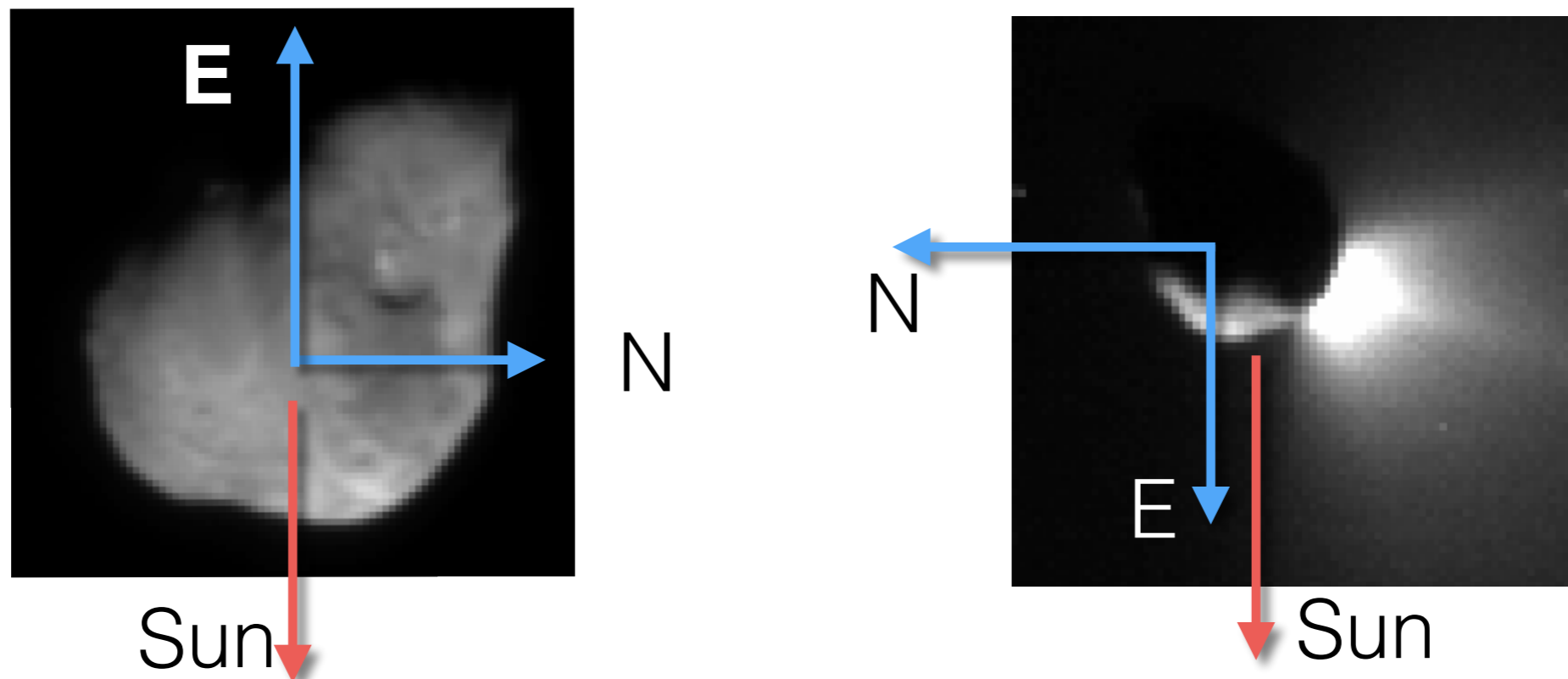
MRI Calibrated Data of 9P/Tempel 1 Encounter

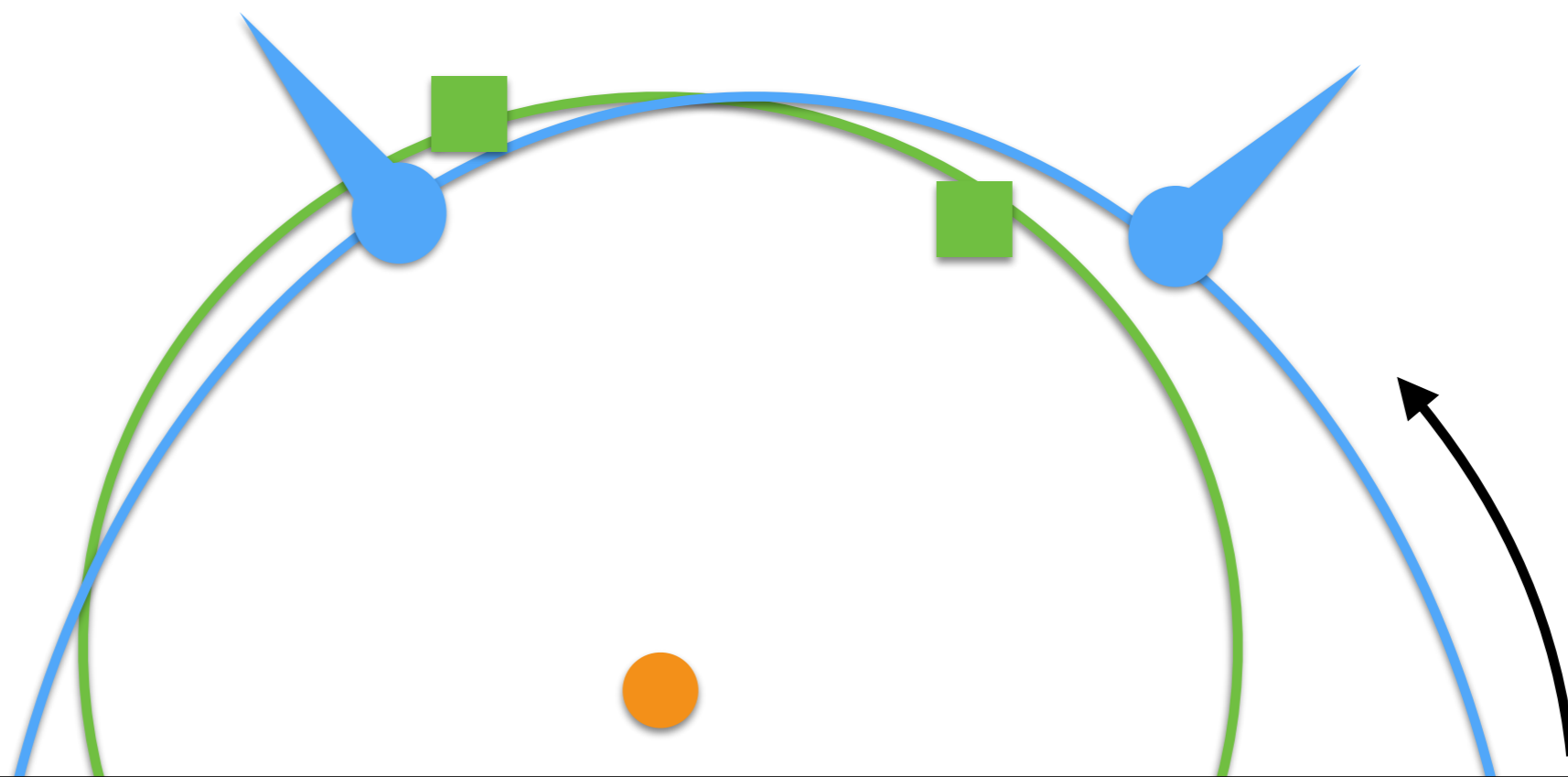
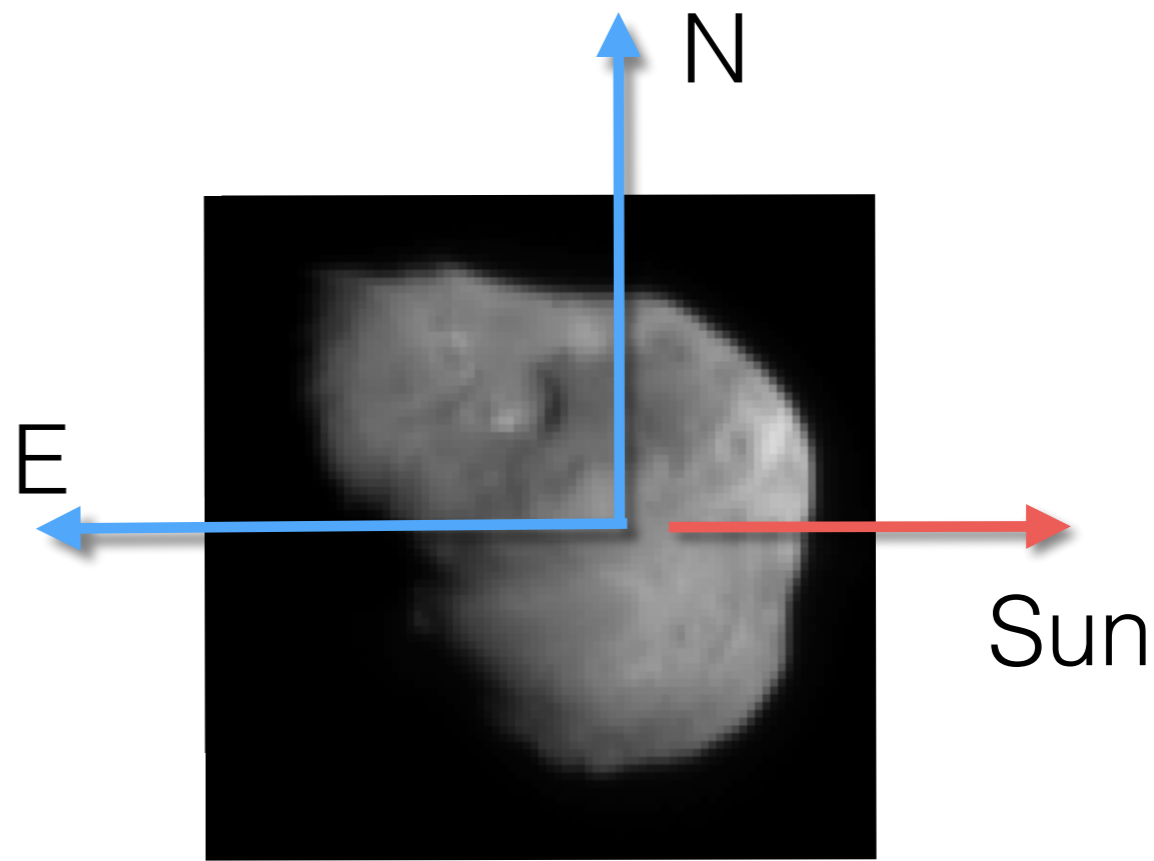
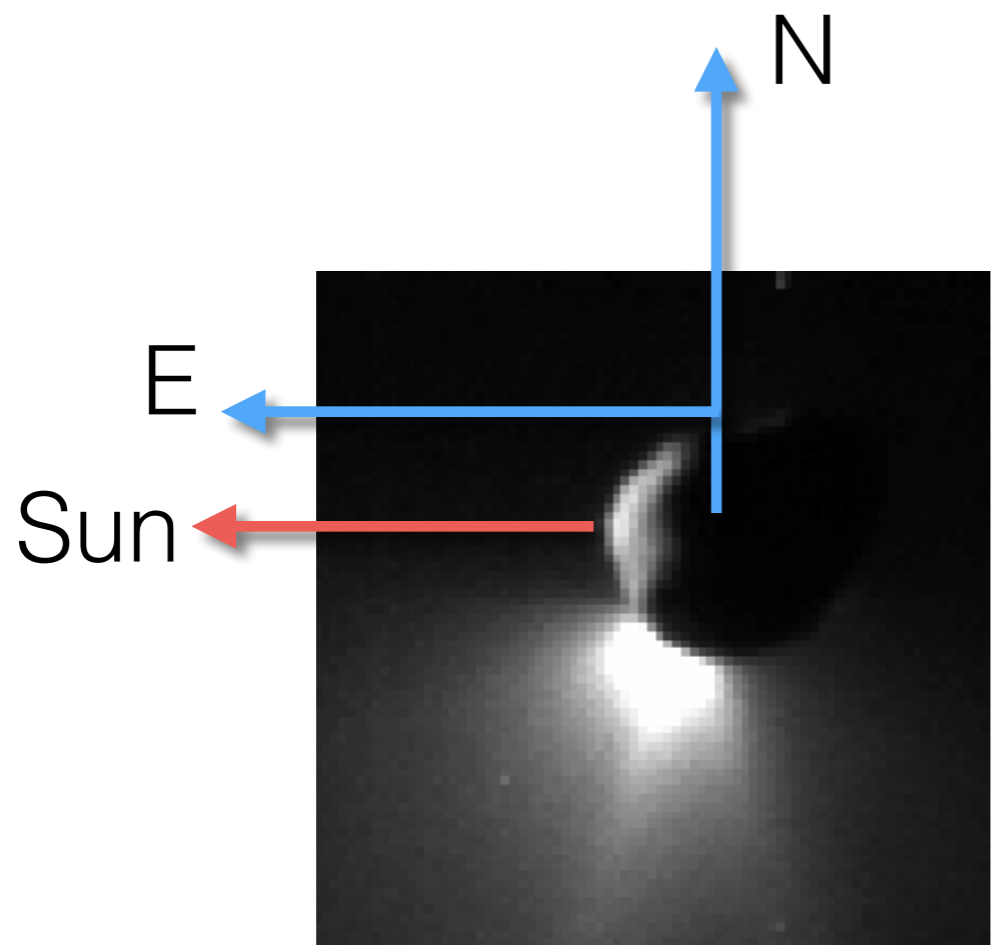
Summary

- Changes from v2.0:
 - Improved observation time stamps
 - Changed decompression lookup table for zero-DN
 - Removed I/F data, added conversion factors to RAD data
 - Application of horizontal destriping process
 - Improved radiometric calibration constants
- Otherwise identical dataset as v2.0
- Include all required component, well documented with clear documents

East-West Orientation Problem

- Using this convention for Tempel 1 approach images, ecliptic East is toward the top, ecliptic North is toward the right, and the Sun is down. After impact, the Flyby spacecraft came out of shield mode and turned around to lookback at the comet. For lookback images, ecliptic East is toward the top, ecliptic North is toward the left, and the Sun is down.

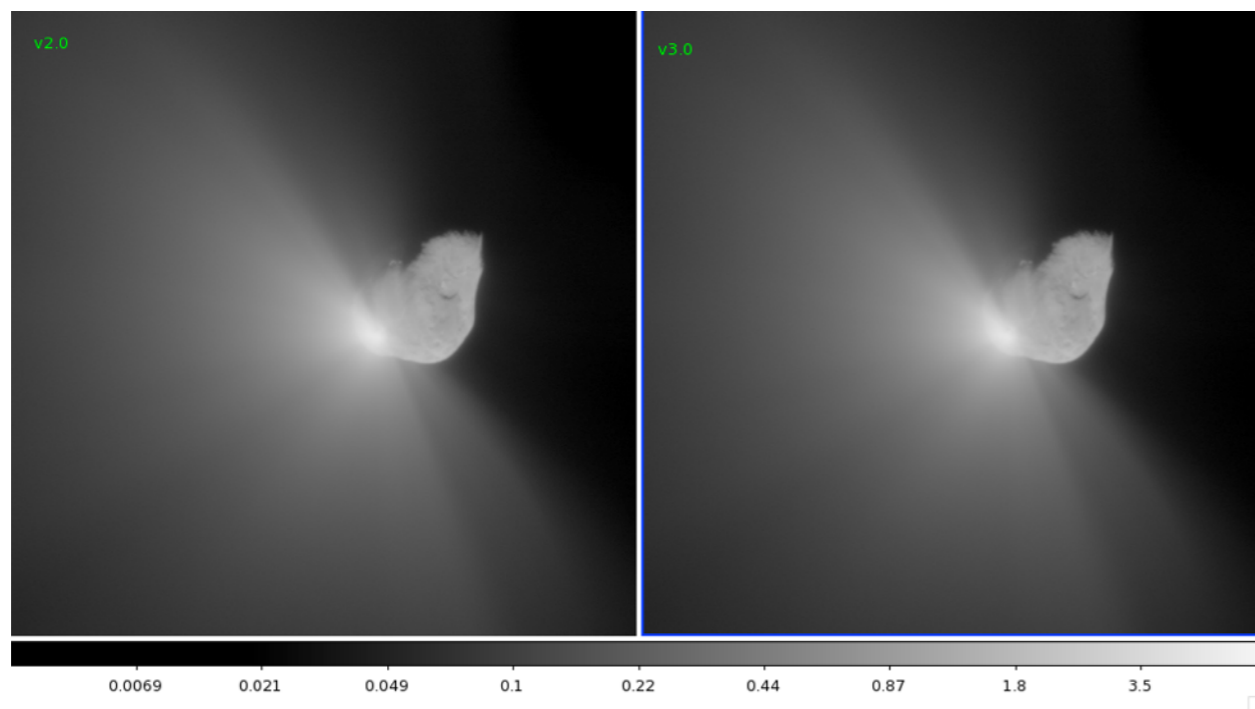
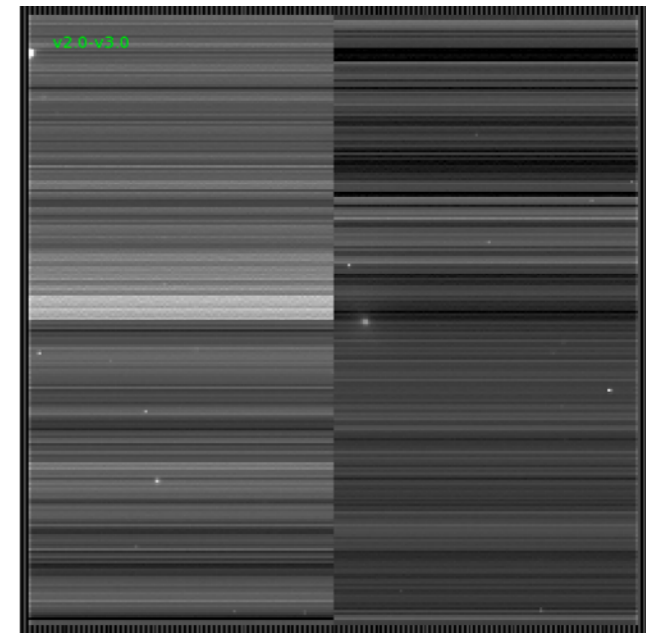




Catalog Files

- dataset.cat:
 - Center wavelength of CLEAR6 is 650 nm, not 600 nm
 - Line 613: typo: “as strong as”
- Why all Tempel 1 datasets don't have target catalog files?

Comparisons Between v2.0 and v3.0 images



Comparisons Between v2.0 and v3.0 images

- 150/mv05053001_5003008_001_r:
 - v2.0: RADCALV = $3.411e-5$
 - v3.0: RADCALV = $3.3628571e-5$, IOFCALV = 1435.0535, IOFCALD = 1.5495068
 - EPOXI:DATA_TO_IOVERF_MULTIPLIER = 0.0052562
 - EPOXI:DATA_TO_RADIANCE_MULTIPLIER = 1.0
 - EPOXI:DATA_TO_DN_MULTIPLIER = 594747.2400000
- Check photometry for 3, 5, 7 pixels radius apertures:
 - v3.0 converted to I/F: $1.37348377e-05$, $2.28473470e-05$, $3.17278015e-05$
 - v2.0 I/F image: $1.38544847e-05$, $2.28495195e-05$, $3.15180045e-05$

Too many trailing 0's

All numbers consistent.

Recommendation

- Good and useful datasets that should be accepted by PDS/SBN to replace the v2.0 dataset
- No problems identified with the data. Need to correct the problems in the document as identified here, especially the image orientation problem
- Certified

ITS Calibrated Data of 9P/Tempel 1 Encounter

DESTRIPE extension

- Either remove DESTRIPE extension in the FITS files, or note in the dataset.cat that all values in it are set to 0 because this step is not applied to ITS images.

Catalog Files

- dataset.cat:
 - Line 302: on-board "impactor" spacecraft
 - Line 517: type: Belton et al. (2011) (typo)

HRI Raw and Calibrated Data of C/Garradd

Summary

- Similar structure and documents as corresponding MRI datasets
- Datasets include all required components, well documented with clearly written documents. No major issues identified
- Nearly all (minor) problems identified for MRI datasets apply to these datasets