

(Didymos Data v2.0)

LUCY L'LORRI Data Review

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1. Datasets overview

- PDS version: PDS4
- 2 sets from the high res cam L'LORRI.

lucy.lorri:data_didymos_raw::2.0

lucy.lorri:data_didymos_partially_processed::2.0

- Mission phases:
the Lucy Mission Didymos mission phase
- Datasets comparison:
1549 raw images
1549 partially calibrated images
- Summary:

Only a few small issues. The collection overview.txt definitely needs to be fixed if kept in the small bundle. Same image label issues as the Donaldjohanson phase data.

2. Review process

- Use astropy fits.open and DS9 exam some fits
- Test files with pds4_tools: Read **all** .fit and label files, save image to png and check all image content. (**all can be read correctly**)
- Check consistency between levels with tools:
Diff Files 23.1 and Beyond Compare 4.4.1
- Check the headers and compare the labels between sets
- Compare and review labels and sis file
- Compare and review document
- Collect aspect data from all images

3. Documents

- data_didymos_partially_processed/Collection_overview.txt
 - Entire text refers to Dinkinesh encounter, but this file is supposed to describe Didymos observations. Needs full mission context correction.
 - “Closest Approach occurred at 17:51:16 UT April 20, 2025 at a distance of 962 km. All tCA calculations (time of closest approach) are calculated from this date.” unrelated.
 - Wrong reference paper
 - Add bundle context
 - Add usage guidance of this data

4. Data and Label

- Files can be correctly read by python, pds4 python tool and ds9.
- Error image added to the partially processed data, but the display support is not in the label. Same problem for quality flag.
- SPICE data are available and included in the label completely
- All partially processed image extension unit, *image*, *error* and *quality flag* are DN/s ?
- For raw data, in the label there is the unit for histogram as DN. It's a count too, but should not mix with DN.
- Dinkinesh constant for Didymos phase

5. Conclusion: Certifiable.