

PDS-SBN Data Review

SOHO comet observations in 1996

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Images:

- **Processing:**
 - Problems remain with the LASCO images in the PDS SOHO archive. As they stand, they are not suitable for release/archiving. There is ongoing correspondence between myself and Matthew Knight to resolve the processing issue(s), so unless requested (...??), they will not be discussed further at this point (with the exception of a brief mention in the summary)
- **Labels**
 - Image “Start” and “Stop” time
 - Within the .lbl files for each image (also the “keyword_glossary” file), the beginning and end time of each individual exposure is given. (The “STOP_TIME” value is calculated by “adding the exposure duration value to the start time as extracted from the FITS file”. Additionally, the exposure duration is corrected using the exposure correction factor.) The “start”, “stop” and “exposure duration” values are formatted to 1000ths of a second. It must be noted in the documentation that after *all* appropriate corrections:
 1. LASCO exposure durations are accurate to better than 1/10th second
 2. Absolute times (SOHO clock) are accurate to better than 15 seconds
 - The current scheme implies (to me, at least) a precision in time recording that does not exist within any SOHO data product!
 - Consider removing “STOP_TIME” value in data label files (and associated documentation).
 - Chapters 7 & 8 of the LASCO C3 Calibration paper (see below) discuss this in detail.

Documentation:

- */document/comet_pos/ sub-directory*
 - *pos_1996.tab*
 - Missing constants are incorrect. The documentation claims they are of the form -9999.99 (or variations thereof), but in the actual *pos_1996.tab* file, they are just ----'s.

- Three different image times are given:
 1. Corrected (calibrated) start time
 2. Mid-time (corrected UTC time of s/c at midpoint of image)
 3. “Old” time (uncorrected UTC time of s/c at midpoint of image)
 - Bearing in mind the aforementioned uncertainties, reconsider the inclusion of these three time formats in favor of a single (corrected) start time
- Add the corrected exposure time to this file

- pos_expl.txt
 - Note that post Aug 2004, the astrometry files contain extra information in the first row (SOHO#, Camera, Discoverer)
 - Maybe clarify that the column “know” differentiates comet positions (know = 0) from star positions (know = 1)
 - Regarding the statement “*For images which do not have an identified comet, these values are replaced by -999.999 of the same width as the corresponding field.*” -- there are no such lines in the astrometry files as they exist now. Only images with an identifiable comet were used for SOHO astrometry measurements. If this “missing” data is to be subsequently added to the astrometry files, it will need to be made very clear that the new measurements were performed “after the fact”, on a different machine/OS, with a different operator (SOHO measurements can be subjective...), and potentially with a different version of software.
- /document/comet_elements.txt
 - <picky> Inconsistency in spacing for the name of comet “discoverer”. Example: “X.Leprette” and “X. Leprette”. This could cause issues for someone who has written a whitespace-dependent program of some kind... </picky>

References:

- Review (and add to list) “Calibration of the SOHO/LASCO C3 White Light Coronagraph”, Morrill et al, Solar Physics (2006) 233: 331-372

Bottom line:

- The processed images continue to be a problem and are still not suitable for the PDS archive. Again, I will restate my previous recommendation that the use of a 'Level-1 variant' data product be reconsidered in favor of the well-established and widely available level-0.5 data (upon which all current SOHO comet data and papers are based). Additionally/alternatively, consider the use of the easily available NRL LASCO Level-1 data product, which would only required a conversion to the desired units.

Aside from the images, and the few notes described earlier, the SOHO data archive appears to be in very good shape. Developers should keep in mind the possible future addition of (the currently incomplete/unpublished) SOHO comet photometry data. For *absolute* completeness of the SOHO comet dataset, additional consideration should be given to including:

1. comets discovered by the SOHO SWAN instrument, and
2. data from observations of comets by the SOHO UVCS instrument