New Horizons KEM2 K7 Peer Review 10-11 Feb 2025 Liens List

Last update: 2025-03-03

NOTES:

1. Liens sorted by [Priority Liens](#_mtjrtjbu4jzw), [Suggestions](#_uchs56s1d1), and [Liens SBN Will Fix](#_h79nzdfv6k68). These are further split for those specific to individual bundles or those for multiple bundles (“General”):
   1. [Priority Liens](#_mtjrtjbu4jzw): Issues that need to be resolved by the NH SOC for current and future deliveries
   2. [Suggestions](#_uchs56s1d1): Items that are requested, but not required, to be fixed or improved if possible.
   3. [Liens SBN Will Fix](#_yje303mzbi9j): Issues that SBN will fix. If NH SOC has issues with any of these fixes, please advise SBN. NH SOC is also free to fix these.
2. For further details or clarification, presentations and notes can be found here: <https://sbnreview.astro.umd.edu/202502_NHK7/notes-presentations/>
3. Liens/comments without a leading set of a person’s initials means they are from SBN or a combination of reviewers. A slide number may be included as well, to link to their presentation.
4. per 2024-12-11 email between SBN-TB and NH-JWP, the nh\_mvic:calibration\_files::2.0 and nh\_mvic:kem1\_cal::2.0 and nh\_mvic:kem1\_raw::2.0 collections are withdrawn as they do not provide anything new.

# Priority Liens

## General (for all/multiple bundles/instruments)

* For all labels, update the <publication\_year> to 2025
* The following dictionaries are not available. Please reach out to dictionary stewards to get these or a more recent available version released/ingested:
  + PDS4\_IMG\_1J00\_1900 (This version is missing for 1J00, so used GetHub PDS4\_IMG\_1J00\_1910 for validation without issue, but this version is also not released.)
  + PDS4\_SP\_1J00\_1320
* The referenced LDD PDS4\_NH\_1J00\_1100, is missing the nh:REX\_Radiometry\_Information required for REX. Please update to PDS4\_NH\_1J00\_1200. But with version 1200, in nh:Spacecraft\_State, the attribute nh:pointing\_method is deprecated and can no longer be used and will cause validation errors.
  + SBN-AR 2/28: “It was deprecated because it was a pipeline control information that has no applicability to end users. This was on advice of the team, as transmitted by Kate C. in a conversation that included both Caden and Brian Enke.”
* collection.lblx files:
  + Ensure that the Citation\_Information.description (i.e. Abstract of the collection) is unique to the collection (version), and contains a terse description including highlights and description of the collection. We should expect to see mention of the: instrument full name (where applicable), the text "New Horizons", data processing level, time range and/or mission phase of data, primary target(s) if any, and any big version changes (i.e. added data or re-calibrated). Look at prior PDS3 dataset ABSTRACT\_DESC or already released PDS4 NH collections for examples. This should be no more than 3-4 sentences. These will be used in the published DOI metadata for the collections.
    - SBN-TB: There are cases where the bundle instead of the collection are described; these should be fixed.
  + Add a LIDVID reference (not LID, as they are unique to each version of the collection) to the collection overview document (if any) to the <Reference\_List>.
  + Do not assume that listed references in the bundle are inherited in the collection. Please include all references important to the collection in the <Reference\_list>. In particular for the data collections, this would be a reference for the instrument document collection, but may also apply to the mission document collection as well.
  + Higher processing level (ex: calibrated, derived, etc.) data collections should reference in the <Reference\_list> the data they are calibrated/derived from. In the case of kem2\_cal, it would be kem2\_raw. You may consider using Source\_Product\_Internal instead of Internal\_Reference. In either case you should use LIDVID, not LID.
  + Reference\_List: The Internal\_Reference to urn:nasa:pds:nh\_documents:mission:nh\_mission\_overview (the New Horizons “Prime” mission overview), should instead go to the extended mission overview (urn:nasa:pds:nh\_documents:mission:nhkem\*\_mission\_overview) for the applicable data collections..
  + kem\*\_raw only: Please add to the Reference\_List an Internal\_Reference to the corresponding kem\*\_cal LID and the calibration\_files LID.
  + kem\*\_cal only: Please add to the Reference\_List an Internal\_Reference to the corresponding kem\*\_raw LIDVID and the calibration\_files LIDVID.
  + Please ensure that only the correct primary target(s) and significant ones of note at the collection level. There are cases of wrong targets listed (ex: “space”). It is normally expected that any target listed here can be found in the child data products as well.
* overview.\* files: Below are a set of common issues found. Many of the following issues are resolved for the data collections if you use and update the publicly available KEM1 K5 DOCX files mentioned in one of the Suggestions.
  + The VID for these labels in most cases should match that of the collection VID, unless the overview has remained unchanged from the prior version. Please update accordingly.
  + The data set versions in the body text should be corrected based on the collection VID (for instance KEM2 should be PDS4 v1, not v2), but you can maintain the PDS3 version history, if any.
  + In the kem\* data collections, there are references to PDS3 files that should be switched out for their PDS4 counterparts. Do not use file path structures to reference them. See RF PEPSSI slides 30-34, LF Alice slide 4, and DK REX pg2 #4 for examples.
    - Note that the PDS3 instrument catalog files were converted into the now [instrument]\_inst\_overview.{lblx,docx,pdf} files in the corresponding nh\_documents/[instrument] collections. Note that the Ralph collection has MVIC and LEISA.
    - Note that references to NH-J/P/SS-SPICE-6-V1.0 are still valid, but it may be useful to include the static DOI (10.17189/1520109) to this data set.
  + RF: There are "<95>" characters found in the sections: 'Instrument description', and 'Other sources of information useful in interpreting these Data'. Please fix. See RF SWAP slides 89 and 103 for examples.
  + kem1\_{raw,cal} only: The version history should not include the PDS3 NH-A-[INSTRUMENT]-[23]-KEM2-V1.0 as their predecessor. But if there were KEM1 data products (LORRI, PEPSSI, SWAP) in the PDS3 KEM2 data set, please mention that they were moved to the current KEM1 PDS4 version from that KEM2 PDS3 data set.
  + LF Alice slide 5: Correct the Filename/Product IDs description: ".LBL" to ".LBLX"
  + EN-RC: Use https for URLs, so *schemaLocation="http://pds.nasa.gov/pds4/pds/v1 http://pds.nasa.gov/pds4/pds/v1/PDS4\_PDS\_1J00.xsd* should be *schemaLocation="http://pds.nasa.gov/pds4/pds/v1 https://pds.nasa.gov/pds4/pds/v1/PDS4\_PDS\_1J00.xsd*
  + XZ LORRI pg 4: For any partially processed collections, clarify what "Partially processed" means, namely the partial calibration steps applied.
  + For kem1\_\*, remove reference to "Refer to the document/superseded\_files\_\*.tab file for details." as this is no longer true. The superseding FITS files are put into their corresponding kem1\_\* collection and versioned.
* Data labels:
  + kem\*\_cal only: Reference\_List: Note that in general, when calibrated products are referencing calibration products or source raw product, they should be LIDVID references, not LID references since the user needs to know exactly what file was used to produce the product they are looking at, not the most recent version of that calibration or raw product. This is done for some, but not all such cases in these calibrated data product Reference\_List.
* For the bundle readme.txt files, please ensure the NH SOC contact is correct. Currently Alice, REX, and SDC list Jillian Redfern instead of Joel Parker.

## Documents Bundle

* Add Context\_Area to many product labels, and add if applicable/relevant:
  + Investigation\_Area(s)
  + Observing\_System (Host and Instrument)
* file: 'nh\_documents/mission/nh\_mission\_trajectory.lblx'
  + line 276: Sanity check the subtle change from "(2000-01-01T12:00:00 UTC)" to "(2000-01-01T12:00:00 TDB)" for J2000 epoch time.
  + RF SWAP slide 7: The geom:spice\_kernel\_file-name references naif0012.tls, whereas in the <description> values of UTC\_CAL and UTC\_DOY, it references naif0010.tls. Please fix. See lines 87, 285, 294.
* file: 'nh\_documents/mission/soc\_inst\_icd.pdf'
  + BH LORRI slide 5: The SOC document says compute a median, but the FITS headers say that a mean was used, via the BIASMTHD keyword.
    - Per Howard Taylor, it could be either mean or median. Please update the ICD to reflect this.
  + BH LORRI slide 9: No description in the SOC document of how to remove the bias for windowed images
    - LORRI team will look at their code to see how windowing is processed
    - SBN-AR: Maybe we need a supplemental document for the calibration process?
    - Please update the ICD.
  + SJ PEPSSI slide 6: The PEPSSI section (p96) of this document refers to a file called PEPSSI\_BTI\_GoodTimeIntervalsBadTimeIntervals\_2022\_149.txt that is not included in the PEPSSI document collection. This issue was reported at the last review.
    - SJ PEPSSI slide 18: The missing PEPSSI\_BTI\_GoodTimeIntervalsBadTimeIntervals\_2022\_149.txt either needs to be provided in the documents directory or the soc\_inst\_icd needs to be modified so that it refers to the “pep\_bti.tab” file.
  + RF PEPSSI slide 10: pg 82 makes mention of "the RATEBOXDEFINITIONPLANES.FIT file available in the CALIB/ directory of the PDS archive", but this is PDS3 thinking, not PDS4. Please sanitize this.
    - RF PEPSSI slide 11: Also see pg94 section 11.4.1.7.1 for similar text
    - SBN-TB: For backward compatibility you may want to consider having both a PDS3 and PDS4 reference.
* files: 'nh\_documents/\*/seq\_\*\_kem[12].\*':
  + Add coverage information to the label to help the user understand why there is a discrepancy between entries inferring being powered off but there is data taken.
    - SJ SWAP slide 8: Suspect the tables are incomplete due to last entries being power off, but the summary plots showing data after the power off.
    - SJ PEPSSI slide 8: Suspect the tables are incomplete due to last entries being power off, but there are data files continuing after a power off or starting before the power on during the mission phase.
    - SBN-AR: Add coverage information to the label to help the user understand why this is the case.
* directories: 'nh\_documents/swap/kem[12]\_summary\_plots'
  + These should each be moved to their own collection in the nh\_swap bundle as discussed.
    - Please use the first release of urn:nasa:pds:nh\_swap:kem1\_data\_summary\_plots::1.0 as a good starting point for an updated kem1 and a new kem2 collections. SBN has some code to help.
  + There should be one label per summary plot, instead of one label for each time division.
  + Per conversation between SBN:LF/PL and NH-PJ in Oct 2024, for each label, there was a problem with the units describing each panel. Below is a corrected description (wording can change):
    - The top panel is Coincident (COIN) Count Rate in [Hz] detected in each energy bin.
    - The 2nd panel is the Total Coincidence Count Rate [Hz] for all the energy steps in a coarse scan
    - The 3rd panel is a color-coded indication of operating parameter settings
    - The 4th panel is the Sun theta angle [deg] in spacecraft coordinates (Red is a zoomed view)
    - The 5th panel is the Sun phi angle [deg] in spacecraft coordinates (Red is a zoomed view)
    - The 6th panel is either the Jupiter-to-Spacecraft distance in Rj, or the Sun-Spacecraft-Earth angle [deg], as labeled.

## Alice Bundle

Certification Status: *NOT CERTIFIED, need to clarify the dark calibration situation between SOC, PDS, and reviewers. Also missing field descriptions.*

* JN slides 8-10: No pointing files for mapping Lyman-Alpha emissions, or scan rate info. Please provide and/or reference (in overview?) where to find these.
* Unknown LID reference urn:nasa:pds:nh\_alice:calibration\_files:pa\_row\_offset\_001 is found in 486 labels in kem2\_cal. Please correct or provide the missing file.
* Please rename urn:nasa:pds:context:target:calibrator.test\_image <name> from "Unknown" to something else. The expected value is "Test\_Image", but this may not be appropriate. If there is a better target LID to be used or created, please do change to that. Ex: nh\_alice/kem2\_cal/ali\_0553363484\_0x4b1\_sci.lblx
  + - SBN-TB: This may be related to the interweaved calibration image issue.
* files: 'nh\_alice/kem2\_\*/ali\*lblx'
  + EN-RC: These labels need disp:Display\_Direction for PDS4 to know the orientation.
  + The keyword "nh:ALICE\_Details" should be "nh:Alice\_Details" per NH LDD. Note the change in case.
  + The keyword value for <nh:detector\_name> should be changed from "ALICE spectrograph" to "Alice spectrograph" per the NH LDD.
  + At times there are situations where there is alternating (interleaved) sci data and dark/calib images being taken, but this is not clear without looking at the APRDRPOS (or \*DOOR\_\*) fields to see if they are darks or if the door is shut. There currently is no other way to find these.
    - JN slide 10: Correct/clarify when the Dark observations have science descriptions/targets. Unclear to user why aperture door was closed for 199 observations if science targets are identical to observations with door open
    - If there is a log book or something similar that would be good to provide where possible, if not already. And point to it in appropriate places (overview, icd?, others?).
    - In coordination with SBN, specify a low-effort solution within each label that will specify when this situation is happening, and what the current product is. At the least this would mean identifying the target/type as calibration and the primary result summary as calibration.
    - Please also add to the collection overview mention of the situation when it occurs and how the user can identify them.
    - May also want to add a section to the ICD about the interleaving calibration products, what they are for, and they may/are not used to calibrate the calibrated data.
  + Add missing field descriptions where not present.
* files: 'nh\_alice/kem2\_\*/overview.txt'
  + add description when there are alternating sci and dark (interleaved) observations while taking data and where/when it can be found.
  + It should also be mentioned that these interleaved calibration observations are NOT used to calibrate the calibrated data.
  + LF slide 5: typo "CROUISE" => "CRUISE"

## LEISA Bundle

Certification Status: *CERTIFIED, minor liens.*

* Unknown referenced LIDs:
  + Urn:nasa:pds:nh\_leisa:calibration\_files:cal\_map\_pflat4x
    - SBN-TB: should confirm, but perhaps this should be: urn:nasa:pds:nh\_leisa:calibration\_files:calmap::3.0
  + Urn:nasa:pds:nh\_leisa:calibration\_files:flat\_map\_pflat4x
    - SBN-TB: should confirm, but perhaps this should be: urn:nasa:pds:nh\_leisa:calibration\_files:flatmap::3.0
  + Urn:nasa:pds:nh\_leisa:calibration\_files:pixel\_map\_20160824
    - SBN-TB: should confirm, but perhaps this should be: urn:nasa:pds:nh\_leisa:calibration\_files:pixelmap::2.0
  + urn:nasa:pds:nh\_leisa:calibration\_files:wave\_map should be urn:nasa:pds:nh\_leisa:calibration\_files:wavemap
* files: 'nh\_leisa/kem1\_{raw,cal}/lsb\*lblx'
  + Please add units for fields that should have it, but don’t. Please confirm correct before implementing:
    - For the volt related Field\_Binary, assuming need to add <unit>volt</unit>. Ex fields of <name>: POS\_12V, NEG\_12V, POS\_5V, NEG\_5V, LEISA\_VDDA, etc. In many cases these units were found in the DESCRIPTION in the PDS3 description instead of in the UNIT keyword.
    - Is there a unit for MVIC\_TEMP or LEISA\_TEMP?
  + Please add a <description> to the Table\_Binary <Field\_Binary> entries. It is not clear what these fields are by looking at the <name>, nor should it be assumed. In the PDS3 labels, descriptions were provided.
  + EN-RC: Unknown LID "urn:nasa:pds:nh\_documents:leisa:leisa\_ssr". Should be "urn:nasa:pds:nh\_documents:ralph:ralph\_ssr"
  + SBN-AR: Please spell out the extension "Et Quaternion" and which quaternion format it is in the Table\_Binary/description field.
* files: 'nh\_leisa/kem1\_cal/lsb\*lblx
  + calibrated Indexes 6,13,15 Per-pixel pointing vectors: Please change these from Array\_3D to Array\_3D\_Image to conform with PDS migrated effort and what was in PDS3 labels.
  + calibrated index 13 typo in <name>: "Per-pxel" to "Per-pixel"
  + For the Array\_3D\_Spectrum object, there is no unit specified. Should it be: <unit>erg s\*\*-1 cm\*\*-1 Angstrom\*\*-1 sr\*\*-1</unit>

## LORRI Bundle

Certification Status: *CERTIFIED, with minor liens.*

* For the KEM1 data collections, should Hal Weaver remain as an author (not necessarily first) of these KEM1 v2.0 collections due to the bulk of these data products being from K5 and prior, him being the first and only author?
* files: 'nh\_lorri/kem[12]\_{raw,cal}/collection.lblx'
  + for kem\*\_cal only: The <title> and <processing\_level> claim this data to be Calibrated, but they were determined to be partially processed.
  + Add a period after "L" in "Brown, L" within the <author\_list>.
  + EN-RC: Since many data product labels have the following target LIDs, please consider adding them to the collection.lblx file.
    - urn:nasa:pds:context:target:astrophysical.cosmic\_background
    - urn:nasa:pds:context:target:dust.dust
    - urn:nasa:pds:context:target:planet.saturn
    - urn:nasa:pds:context:target:star\_cluster.ngc\_3532
    - urn:nasa:pds:context:target:trans-neptunian\_object.2020\_ks11
    - SBN-TB: Please keep only primary target(s) and significant ones of note, at the collection level.
* files: 'nh\_lorri/kem\*/lor\_\*.lblx
  + Add a period after "L" in "Brown, L" within the <author\_list>.
  + Observing\_System\_Component for LORRI says the <name> is LORRI and gives a <description> giving the fullname. Please just put the full name in the <name> instead.
* files: 'nh\_lorri/kem\*\_cal/lor\_\*.lblx
  + The <processing\_level> claims to be "Raw" but it should be "Partially Processed"
  + For the "LORRI Error Image" and "LORRI Quality Flag Image" objects, please change their type from Array\_2D to Array\_2D\_Image and provide display information as was done in v1.0 of KEM1 data collections.
  + For the "LORRI Error Image" and "LORRI Quality Flag Image" please add a slightly more verbose description of these objects to help the user know what is good vs bad values as was provided in PDS3. Also, for the Quality Flag values, please define <sb:Ancillary\_Data\_Objects> <sb:Quality\_Maps> so the user is not guessing what the values mean.
  + The Quality Map's <value\_offset> should be changed from 0 to 32768.0
* XZ pg 4: For the kem\*\_cal overview documents, there are Calibration Contradictions; some steps are listed but stated as unnecessary. Clearly indicate which steps were done.
* XZ pg 4: For the kem\* overview documents, please explain what the term "noodles" means (i.e. series of scans across surface with overlapping frames). You may want to also include this in the ICD.

## MVIC Bundle

Certification Status: *CERTIFIED, with minor liens.*

* files: 'nh\_mvic/kem2\_{raw,cal}/collection.lblx'
  + for kem\*\_cal only: The <title> and <processing\_level> claim this data to be Calibrated, but they were determined to be partially processed.
  + Currently "space" is listed as the only target for these collections. Please correct this to be the primary target(s) observed or intended.
    - EN-RC: No child products use the "space" target.
* files: 'nh\_mvic/kem2\_{raw,cal}/m\*lblx'
  + For kem2\_raw first Array\_2D\_Image "Observational Image" and kem2\_cal error array and Data quality array object, if the following description for windowed data is true, please add missing\_constant of -1 under Special\_Constants at the end of the object.  
     This array contains data only for pixels within the window(s) defined by the   
     Subframe(s) listed for this product. Other pixels have been set to -1.0, the   
     defined "missing\_constant".
  + kem2\_raw only: For the Table\_Binary Housekeeping, please add back the descriptions of each field to give a user a hope to understand what data they are looking at.
  + kem2\_raw only: For the Table\_Binary Housekeeping, please include a <unit> where appropriate. Many of the descriptions mentioned the unit. EX: POS\_12V has "volt"
  + kem2\_cal only: For the Error array and Data quality array objects, change its type from Array\_2D to Array\_2D\_Image and provide display information as was done in v1.0 of KEM1 data collections.
  + kem2\_cal only: For the error and data quality array objects, please add a slightly more verbose description of these objects to help the user know what is good vs bad values as was provided in PDS3. Also, for the Quality Flag values, please define <sb:Ancillary\_Data\_Objects> <sb:Quality\_Maps> so the user is not guessing what the values mean.
    - [XZ pg 2] stated she needs to know these Quality flag values and they should be added.
  + EN-RC: Unknown LID "urn:nasa:pds:nh\_documents:mvic:mvic\_ssr", should be "urn:nasa:pds:nh\_documents:ralph:ralph\_ssr"
  + EN-RC: Only the first Array\_2D\_Image has a corresponding disp:Display\_Settings. The other two, error and quality, need it for orientation as well.
  + kem2\_cal only: In the sb:Flat\_Field lists the filename as being \*.fits, but it is really \*.fit. This appears to have been grabbed from the FITS headers which also has \*.FITS.
* Files: ‘nh\_nh\_mvic/kem2\*/overview.\*’
  + XZ pg2: typo "distorion" to "distortion"
  + XZ pg2: Make the title consistent between data processing levels: "Ralph MVIC" and "MVIC" or "KEM2 Raw" and "KEM2 CRUISE", etc.

## PEPSSI Bundle

Certification Status: *CERTIFIED, with minor liens.*

* directory: 'nh\_pepssi/calibration\_files/'
  + SBN suggests that this collection be withdrawn unless there are updates that need to be made to the released v1.0.
    - There are only two tables (hk\*) provided in this collection. They are unchanged from the migration efforts.
    - Note that the rateboxdefinitionplanes product was not provided.
    - Note that the CALPARS were not provided for KEM2. SBN believes they are using the same one as for KEM1.
    - SBN has released their migrated collection just after the peer review.
    - Looking at the files, the SBN copy may be in better shape, more details, etc.
  + file 'nh\_pepssi/calibration\_files/collection.lblx': time values not needed for calibration products
  + files 'nh\_pepssi/calibration\_files/hk\*lblx': SJ slides 12, 18: typo "containscoefficients" should have a space inserted.
* files: 'nh\_pepssi/kem[12]\_{raw,cal}/collection.lblx'
  + In the past the target has been SOLAR WIND, but now it is Arrokoth for kem1\_\* and "space" for kem2\_\*. Please update to the target that will be used in the data products.
* files: 'nh\_pepssi/kem\*/pep\*.lblx'
  + Target\_Identification: Please replace the target Particles (type=Dust) in the interim to be Solar Wind (type=Plasma Stream) or create a new context object.
    - urn:nasa:pds:context:target:dust.interstellar\_particles vs urn:nasa:pds:context:target:plasma\_stream.solar\_wind
    - It was also suggested to create a new context product for a target that more closely aligns with the actual PEPSSI target. Feel free to consult with PDS if you go this direction.
    - SBN-LK: Suggest to use "Charged Particles"
  + In the Pha Electron binary table, the Cross\_Talk\_Indicator field should be of type "ASCII\_String" not "SignedByte".
  + In the Pha Low Ion binary table, the H0 and H1 fields should be of type "ASCII\_String" not "SignedByte".
  + In the Pha High Ion binary table, the Cross\_Talk\_Indicator, H0, and H1 fields should be of type "ASCII\_String" not "SignedByte".
* files: 'nh\_pepssi/kem\*\_cal/pep\*.lblx'
  + The Array\_2D\_Spectrum do not have any display settings.
  + There are no calibration files being referenced. At minimum, please add a reference to the calibration\_files collection.
    - Note that additional calibration information is buried in <descriptions>. Should this be somewhere more computer readable?
    - Are there any calibration files to reference? I see calibration values located in the field descriptions at times and we have a calibration\_files collection with nothing being referred to.
  + Add back a description of the Array\_2D\_Spectrum. It helps to understand what is going on in the table. For instance for the Spec\_Helium\_Image, it tells the user each bin is 0.016666667 hours width.
    - Without the description, it is unclear what the Array\_2D\_Spectrum of name PRIMARY is. I believe it is the PHA\_Spectrogram.
* Products LIDs duplicated from K5: Are these unexpected new versions? The checksums are different. If they are not new and contain no new data, can they be withdrawn? Alternatively, they can stay, just version them, and add back the modification\_history, and in v2.0 modification\_history mention new/updated data (or headers, or what?) and reprocessed labels. SBN can assist with versioning the labels but will need to know what to do.
  + \* urn:nasa:pds:nh\_pepssi:kem1\_raw:pep\_0408433917\_0x691\_eng::1.0
  + \* urn:nasa:pds:nh\_pepssi:kem1\_raw:pep\_0408520317\_0x691\_eng::1.0
  + \* urn:nasa:pds:nh\_pepssi:kem1\_raw:pep\_0408606717\_0x691\_eng::1.0
  + \* urn:nasa:pds:nh\_pepssi:kem1\_raw:pep\_0408693117\_0x691\_eng::1.0
  + \* urn:nasa:pds:nh\_pepssi:kem1\_cal:pep\_0408433917\_0x691\_sci::1.0
  + \* urn:nasa:pds:nh\_pepssi:kem1\_cal:pep\_0408520317\_0x691\_sci::1.0
  + \* urn:nasa:pds:nh\_pepssi:kem1\_cal:pep\_0408606717\_0x691\_sci::1.0
  + \* urn:nasa:pds:nh\_pepssi:kem1\_cal:pep\_0408693117\_0x691\_sci::1.0

## REX Bundle

Certification Status: *CERTIFIED, with minor liens.*

* files: 'nh\_rex/kem2\_{raw,cal}/collection.lblx'
  + Target\_Identification: This lists "space" as the target, but the data products never use this target. Please correct.
* files: 'nh\_rex/kem2\_\*/r\*lblx'
  + The cited NH LDD needs to be updated to include nh:REX\_Radiometry\_Information and its children. Version 1200 of the NH LDD resolves this.
  + Except for the rex\_\* data (which is "DSN"), why is the target "Dust"? Is this correct? Please correct if not.
  + DB pg 1: What is "Thresholded Data" as mentioned in the <title> of many of the products? Thresholded what? They appear to be the same as the REX Side-A and REX Side-B data. Could this be specified better within the label?
* files: 'nh\_rex/kem2\_\*/overview.txt'
  + DK pg 1: Reference to "thresholding" but there is no description of what this is. The activities report does give an explanation. Please mention what the Thresholding data is in the data collection overview document, and that there are no plans to do it again.
  + DK pg 1: References to urn:nasa:pds:nh\_documents:rex:nh\_pepssi\_ti
    - SBN-TB: Not found with this LID. If looking for the pepssi\_ti, it is in the pepssi collection. But if this is a typo and should be rex\_ti, it was not migrated. Should we?

## SDC Bundle

Certification Status: *NOT CERTIFIED, due to missing field descriptions in the labels. No need for delta review once liens resolved.*

* If not already present, please provide information on changes to the spacecraft's state. This may be needed when interpreting the data and accounting for abnormalities.
  + - For instance, see DM slide 13, for an example of threshold changes.
    - Please add a description of any such instances in the data collection overview document.
    - SDR noted that for REX there is an activity guide. Could that be referenced or something similar be generated for SDC?
* Please double check for the documentation for temperature changes believed to be requested at the previous review. May want to add a reference to the data collection overview documents and/or elsewhere.
* directory: 'calibration\_files/'
  + Released v1.0 of this collection is formatted differently, splitting tables by channel, and not naming them quite the same way. Coordination between NH SOC and SBN needed to sort out how to version things and relate them to the new tables.
    - Review version (v2.0) has only 3 calibration products verse 42 tables (and one condensed source file) in released v1.0.
* files: 'nh\_sdc/kem[12]\_{raw,cal}/collection.lblx'
  + Target\_Identification: KEM1 lists Arrokoth as the target and KEM2 lists "space". None of the data products lists these. I understand why for KEM1 the target may be listed as Arrokoth, but not why KEM2 is listed as "space". I would suggest at least adding (if not replacing with) "Dust" as a target as well, since that is the primary target of this instrument throughout all mission phases of this spacecraft.
* files: 'nh\_sdc/kem\*\_{raw,cal}/sdc\_\*lblx
  + Please add back the field descriptions. They are helpful to the user. They can be found in PDS3 or kem1\_\* v1.0.
    - This may also include adding Units found in said description (example field CDH\_SDC\_M5\_VOLT or CDH\_TEMP\_SDC\_ELEC).
  + Note that no unit is specified, but should be for many fields. Please fix.

## SWAP Bundle

Certification Status: *NOT CERTIFIED, bring back for a delta review due to documentation concerns; data is fine.*

* directory: 'nh\_swap/calibration\_files/'
  + There appears to be no new products, just reformatted, and if this is true, recommend withdrawing this collection (if withdrawn, most/all the issues for this collection are resolved). Here are some brief notes on changes:
    - background\_009\_dca\_jup: TAB to CSV; Columns in different order;
    - esa\_shape: TAB to DAT (CSV); column header added; lower precision in column 2.
    - list\_energy\_file: TAB to CSV; data unchanged;
    - overview: Needs versioning
    - rpa\_shape: TAB to DAT (CSV); column header added; lower precision in column 2.
  + All LIDs (and VID, except one) match with the migrated collection, but the files are different. First they were fixed width table files, now they are fixed width CSV files (with headers). Also from first glance, in some cases the decimal places are different but perhaps the same? Exceptions noted below:
    - list\_energy\_files.csv VID should be "2.0". In the migrated collection there is a v1 and v2 file. The data match the v2 except it is a CSV instead of tab delimited. Note that this LIDVID is not referenced in any other label, so no other updates needed.
  + files: 'nh\_swap/calibration\_files/\*.lblx'
    - Many of the data files in this collection contain headers, which are not described in the labels. Please add them.
    - SJ slide 20: Clean up the labels in the calibration\_files collection – add back a lot of the info that was previously present in the PDS3 labels.
  + file: 'nh\_swap/calibration\_files/list\_energy\_files.csv'
    - RF slide 123: This file mentions 3 files that cannot be found. Where are they? Should they be in this data collection? SBN-TB: If these are not to be included, we should probably document this in the label. The migrated and released version of this label makes no mention either.
  + file: 'nh\_swap/calibration\_files/overview.txt'
    - RF slide 121: This file appears to describe SDC, not SWAP.
* For the kem1\_\* collections, we ask to include D. McComas as an author (not necessarily the primary author) since the bulk of the data inherited from v1.0 are still in this collection and he was the author.
* files: 'nh\_swap/kem\*/swa\*.lblx'
  + 0x586 images do not appear to have display instructions
  + EN-RC: These need disp:Display\_Settings to orient PDS4's viewing of the data
  + Please add back the <description> values for fields. They were provided in PDS3, and are helpful for understanding the fields.
    - RAW only: This also includes grabbing units from the PDS3 description and adding a <unit> keyword. See examples from kem1\_\* v1.0 collections.
* files: 'nh\_swap/kem\*\_cal/swa\*.lblx'
  + Are there any calibration files to reference? If there are none, please reference the calibration\_files collection in addition to the ICD. If the calibration description or files may change, you should use LIDVID, not LID.
  + EN-RC: Most likely this is fine, but for kem2\_cal/ has no files named swa\_\*\_0x585\_\* while kem1\_raw/ and kem2\_raw/ have a full set of those. Please confirm this is correct.
  + RF slide 152: There was no Thruster Firing information in the 0x586 data for the kem1\_cal collection, is this correct?
    - NH-BE: Should investigate to make sure this is correct.
* Products LIDs duplicated from K5: Are these unexpected new versions? The checksums are different. If they are not new and contain no new data, can they be withdrawn? Alternatively, they can stay, just version them, and add back the modification\_history, and in v2.0 modification\_history mention new/updated data (or headers, or what?) and reprocessed labels. SBN can assist with versioning the labels but will need to know what to do.
  + \* urn:nasa:pds:nh\_swap:kem1\_raw:swa\_0513129632\_0x586\_eng::1.0
  + \* urn:nasa:pds:nh\_swap:kem1\_cal:swa\_0513129632\_0x586\_sci::1.0
* For file 'nh\_swap/kem1\_cal/overview.lblx' line 17 ends in "</author\_list>" but should be "</editor\_list>"
* File: ‘nh\_swap/kem\*/overview.txt typos:
  + kem1\_cal line 1: "Solar Wind at Pluto" => "Solar Wind Around Pluto"
  + line 1: "Oerview" => "Overview"
* Trajectory files
  + For K5 migration, these were turned into their own collection ([urn:nasa:pds:nh\_swap:trajectory::1.0](https://pdssbn.astro.umd.edu/holdings/pds4-nh_swap:trajectory-v1.0/SUPPORT/dataset.shtml)). I recommend updating all these labels from v1.0 with the newly K7 delivered updated products.
  + The provided collection.lblx was quickly put together by SBN:TB for posting purposes. Feel free to use it as a template for v2.0.
  + In v1.0, SBN cited the spice data set with DOI 10.17189/1520109 since these products are based on those kernels.
  + Remove all the PDS3 lbl files, trajinfo.txt, and traj.fmt files and update the xml files to lblx.

# Suggestions

## General (for all/multiple bundles/instruments)

* Suggest creating a subdirectory structure to help those that may browse the archive. The data collection directories can be a bit overwhelming with so many files.
* Add to each reference in the Referene\_List a brief <description> (for external references) or <comment> (for internal references) to give a clue to the user why this reference was included so the user knows why they may want to look at it. For instance, a brief KEM2 mission overview or XYZ instrument description or sourced raw data. Do not assume the LID (PDS4 jargon) will clue a user into what is being referenced.
* For collection and bundle titles, we are trying to expand all acronyms (and include the acronym in paraphasis) to make them more findable in literature searches. Similarly for collections we want to include information in the citation descriptions to make the data more findable.
* For the bundle.lblx, it is recommended to expand the <title> from "New Horizons [INSTRUMENT] Bundle" to "New Horizons [INSTRUMENT] Data Archive" or at least include "Data". "Bundle" is also PDS4 jargon, which is best to avoid.
* For collection.lblx files,
  + Recommend using the <title> values (with appropriate adjustments) from the migrated work.
  + Include funding source acknowledgement in the Citation\_Information.description. (IM 1J00 does not include <Funding\_Acknowledgement>)
  + Spelling out the instrument acroynm is highly recommended to help with find-ability in the <title> or at least the <description>.
  + Recommend slightly expanding the current version Modification\_History to say these are related to the K7 delivery and if they are versioned making brief mention of the additional/updated files.
  + Please add appropriate Science\_Facets to the Context\_Area.Primary\_Result\_Summary
* overview.\*
  + For kem\* data collections only: Suggest using the overview document DOCX from the publicly released kem1 v1.0 data collections and updating it. Contact SBN-TB if you have any questions or need REX copies that may not be publicly available.
  + When mentioning the PDS3 SPICE data set id, you could also reference the static DOI to this data set: 10.17189/1520109
  + SJ PEPSSI slide 18: For the data collections, it would be valuable to help users find files that they have in the past found in the same directory structure.
    - SBN-TB: I suggest we ensure the overview document helps point the users to documents and calibration files as the prior PDS3 dataset.cat file did. I think providing LID/VIDs and mentioning the products can be found in other collections would be helpful. Feel free to address this in a different way if you have a better solution (and let SBN know).
  + kem2\_{raw,cal} only: Recommended to mention the version history of the PDS3 NH-A-[INSTRUMENT]-[23]-KEM2-V1.0 (if there was one). Just remember that the PDS4 VID is still 1.0 (not V2.0). It is worth mentioning the change in archive formats from PDS3 vs PDS4.
* For the data labels, the Citation\_Information.description states the user should look at the parent collection for complete citation information. This is not appropriate. Suggest dropping or adding a terse descriptive boilerplate text.
* Suggest using meta kernel(s) instead of specifying each individual spice kernel, if appropriate.
* For the data labels, when describing each FITS header, it is very generic. If you could add a name, it would be clear what they are the headers are for.
* Context Reference Name mismatch: Within the PDS label(s), please fix/update the <name> values for these LID references:
  + Urn:nasa:pds:context:facility:observatory.dsn to "Deep Space Network" from "Dsn"
  + urn:nasa:pds:context:instrument:nh.alice to "Alice Ultraviolet Imaging Spectrograph" from “Alice”
  + urn:nasa:pds:context:instrument:nh.leisa to "Linear Etalon Imaging Spectral Array"
    - Found: "Ralph LEISA" or "LEISA" or "Linear Etalon Imaging Spectral Array (LEISA) for New Horizons"
  + urn:nasa:pds:context:instrument:nh.lorri to 'Long Range Reconnaissance Imager"
    - Found: "Long Range Reconnaissance Imager (LORRI) for New Horizons" and “LORRI”
  + urn:nasa:pds:context:instrument:nh.mvic to "Multispectral Visible Imaging Camera"
    - Found: "Multispectral Visible Imaging Camera (MVIC)" and "Ralph MVIC"
  + urn:nasa:pds:context:instrument:nh.pepssi to "Pluto Energetic Particle Spectrometer Science Investigation" from "Pluto Energetic Particles Spectrometer Science Investigation"
  + urn:nasa:pds:context:instrument:nh.rex to "Radio Science Experiment"
    - Found: “Radio Science Experiment (REX)" or “REX”
  + urn:nasa:pds:context:instrument:nh.sdc to "Student Dust Counter"
    - Found: "Student Dust Counter (SDC)" and “SDC”
  + urn:nasa:pds:context:instrument:nh.swap to "Solar Wind Around Pluto" from "SWAP"
  + urn:nasa:pds:context:instrument\_host:spacecraft.nh to "New Horizons Spacecraft"
  + urn:nasa:pds:context:investigation:mission.new\_horizons\_kem1 to "New Horizons Kuiper Belt Extended Mission" from "New Horizons Kuiper Belt Extended Mission (KEM1)"
  + urn:nasa:pds:context:investigation:mission.new\_horizons\_kem2 to "New Horizons Kuiper Belt Extended Mission 2" from:
    - "New Horizons Kuiper Belt Extended Mission (KEM2)"
    - "New Horizons Second Kuiper Belt Extended Mission"
    - "New Horizons Kuiper Belt Extended Mission 2 (KEM2)"
  + Urn:nasa:pds:context:target:astrophysical.cosmic\_background to "Cosmic Background Radiation" from "Cosmic Background" (note that C. Gobat created this context object)
  + urn:nasa:pds:context:target:star.eps\_cma to "Epsilon Canis Majoris" from "Epscma"
  + urn:nasa:pds:context:target:star.rho\_leo to "Rho Leonis" from "Rholeo"
  + urn:nasa:pds:context:target:star\_cluster.ngc\_3532 to "NGC 3532" from "Ngc3532"
  + urn:nasa:pds:context:target:trans-neptunian\_object.2020\_ks11 to "2020 KS11" from "2020Ks11"
  + urn:nasa:pds:context:target:trans-neptunian\_object.486958\_2014\_mu69 to "(486958) Arrokoth"
    - Found: "Arrokoth" or "Asteroid 486958 (2014 Mu69)"

## Documents Bundle

* file: 'nh\_documents/mission/soc\_inst\_icd.pdf'
  + Suggest, if appropriate, in the Alice section, to add a section to the ICD about the interleaving calibration products observations, what they are for, and that they may/are not used to calibrate the calibrated data. Also how to identify them?
* file: 'nh\_documents/rex/rex\_activities\_kem\*.{pdf,lblx}
  + DK pg 2: Please add table column titles or descriptions
  + In the label, suggest referencing the MET to UTC translation table to assist in at least roughly converting MET to UTC: urn:nasa:pds:nh\_documents:mission:nh\_met2utc
  + Please add to the label modification\_history what was changed/added, in very general terms. See DK pg 3 #2 for example of what changed.
  + The titles imply this is for KEM1 and KEM2, but the filename implies it is for KEM2. Please rename the PDF file to be just KEM.

## Alice Bundle

* [NONE]

## LEISA Bundle

* [NONE]

## LORRI Bundle

* No snapshot browse files provided as in the past. Can these be provided alongside the data?
* For the data product labels, is the precision of the start/stop\_date\_time values correct? Previously they were "Thh:mm:ss.dddZ" but now are Thh:mm:ss.ddddddZ"
* For the data product labels, in the migrated effort by SBN, the reference <lid\_reference>urn:nasa:pds:nh\_documents:mission:subframe\_window\_summary</lid\_reference> was added. Consider if this is appropriate to add for any of your windowed data products. This comment accompanied the reference: <comment>This document provides some explanation regarding the use of subframes in some New Horizons instrument data (MVIC, LEISA, and LORRI) as well as the source and significance of the "Window Mismatches" table included in some raw data products. "Windows", in this case, refers to pixels downloaded at various times, rather than a mosaicking process. No single "window" necessarily defines all pixels with data in the image.</comment>

## MVIC Bundle

* Suggest adding the <wavelength\_range> keyword to each data product.
* BH slide 4: In the data product FITS files, the header keyword FLATNAME lists the flat file used for the calibration as .fits, but the file itself has .fit
  + SBN-TB: Consider in future releases to correct the FITS header values. Please don't do this for this release.

## PEPSSI Bundle

* [NONE]

## REX Bundle

* [NONE]

## SDC Bundle

* Recommend updating all <author\_list> entries of "Horanyi, M." to "Horányi, M." (note the accented character). Also update the readme.txt and overview.txt body text at the bundle level as well.
* If not already present, consider describing in the documentation or elsewhere what it means when you have hits with the same time stamp, same channel, but different magnitudes.
  + - See DM slide 9 for example in the data of this happening.
    - Caden and Alex: Since time is over a second (time resolution), you could have multiple events within a second.

## SWAP Bundle

* For the bundle readme.txt file, remember to update the text to include the trajectory and summary plot collections. You may want to look at the v1.0 of the bundle to see what it says.
* Recommend generating the summary plot files for all KEM1 Encounter data, not just for data delivered during KEM2 (K6 & K7).
* For the data products, suggest adding the sb:Observation\_Parameters for Exposure and Timing
* If ambitious, recommend linking the corresponding summary plots to each calibrated data product.

# Liens SBN Will Fix

## General (for all/multiple bundles/instruments)

* Backfill modification history for labels that should have prior versions. This affects bundles, collections, document products, and a select few data products.
* File: bundle.lblx
  + The Citation\_Information.description sometimes mentions that the data is raw and processed, and there are calibration files to calibrate from raw to processed, when the data is fully calibrated. When the data collections imply "Calibrated" they should be corrected to say “calibrated” instead of “processed”. This affects LEISA, PEPSSI, REX, SDC, and SWAP.
  + The Modification\_History entry for v2.0 is misleading (i.e. first created). Propose to rewrite it to state: “K7 delivery provided by New Horizons SOC to include new KEM2 and updated KEM1 data collections.” or something similar. Note that this text will be different if there were not KEM2 or KEM1 updates provided or if updated calibration\_files collection were provided.
  + Missing the Investigation\_Area for KEM and KEM2. Currently only NH exists. Please add.
  + The <Bundle\_Member\_Entry> for calibration\_files should have the <reference\_type> corrected back to "bundle\_has\_calibration\_collection" from "bundle\_has\_data\_collection".
  + Ensure all <Bundle\_Member\_Entry> have the correct LIDVID and are included.
* For collection.lblx files (not kem2\_{raw,cal}:
  + For KEM1 data collections, the <title> does not differentiate between KEM1 Encounter data and KEM Cruise 1 data. Recommend using the title listed in v1.0.
  + Citation\_information.editor\_list: Recommend adding back editors from v1.0 due to the bulk effort of v1.0 compared to small additions to v2.0 (in comparison). Feel free to reorder.
  + For KEM1: Ensure the start\_date\_time and stop\_date\_time values reflect the entire collection (including v1.0 products) instead of just the new/updated contents found in v2.0.
  + The Investigation\_Area should be for mission.new\_horizons\_kem1 not mission.new\_horizons
  + KEM1 only: The Investigation\_Area should be for mission.new\_horizons\_kem1 not mission.new\_horizons
* For any collection that is not v1.0, we will need to update the inventory file to include those files in the prior version of the collection that should be included in the current version.
* SBN will coordinate with NH SOC to provide and produce DOIs for each collection.

## Documents Bundle

* File: bundle.lblx:
  + States this is version 3.0, but it should be a later version (v5.0 as of 2024-12-12).
  + Recommend bringing Gobat and Crombie to head of list of editors due to their most recent updates for each collection. Recommend list being: "Gobat, C.; Crombie, M.K.; Gicquel, A.; Raugh, A.; Hirsch, B.; Sharkey, B.; Barnes IV, T.F.; Lawton, P;"
* file: 'nh\_documents/lorri/scan\_rates\_kem1.\*'
  + Change the filename from scan\_rates\_kem1.tab back to scan\_rates.tab. The lblx file can be renamed or not.
  + Update the label <title> and Citation\_Information.description to reflect it is for KEM1 Encounter data only, and update the v1.1 modification\_history description.
* file: 'nh\_documents/mission/collection.lblx'
  + text ordering: <editors> "T.F. Barnes IV;" => "Barnes IV, T.F.;"
  + typo (due to old version inheritance): line 31 "Barnres" => "Barnes"
* file: 'nh\_documents/pepssi/collection.lblx'
  + Please remove the period at the end of the <title>.
  + Update the <editors> to include those from v1.0 (Gicquel, Adeline; Redfern, Jillian)
  + Update the Modification\_Detail for v1.0 to match.
* file: 'nh\_documents/ralph/collection.lblx'
  + Update the <editors> to include those from v2.0 (Hirsch, B.; Sharkey, B.; Gicquel, A.; Barnes IV, T.F.; Redfern, J.)
* files: 'nh\_documents/rex/\*': Note that the migrated v1.0 of this collection is using IM 1.22.0.0. SBN may update the labels to this version.
* files: 'nh\_documents/rex/collection.lblx'
  + Please remove the period at the end of the <title>.
  + Update the <editors> to include those from v1.0: "Raugh, Anne C.; Gicquel, Adeline; Hirsch, Benjamin; Redfern, Jillian"
  + Update the Modification\_Detail for v1.0 to match.
* files: 'nh\_documents/rex/rex\_agcgain\*.lblx'
  + Recommend keeping the <title>, <Citation\_Information>, and <Context\_Area> from the version 1.0 products in these v2.0 products.
* files: 'nh\_documents/sdc/collection.lblx'
  + Please remove the period at the end of the <title>.
  + Update the <editors> to include those from v1.0 (Gicquel, A.; Redfern, J.)
  + Update the Modification\_Detail for v1.0 to match.
* file: 'nh\_documents/sdc/sdc\_chn\_lvl\_dn.lblx'
  + Recommend keeping the Citation\_Information.description from v1.0 product label.
* file: 'nh\_documents/sdc/documents/sdc\_stim.lblx'
  + Recommend moving most of the Citation\_Information.description to the File.comment as was done with v1.0 of this product.

## Alice Bundle

* [NONE]

## LEISA Bundle

* files: 'nh\_leisa/kem1\_{raw,cal}/collection.lblx'
  + Citation\_Information.description: Please add mention of the primary target Arrokoth. Also please add any big changes from v1.0 to v2.0 (i.e. adding data, recalibration, etc).
    - Recommend to add the text from PDS3 K5 (please edit as appropriate): "This data set contains LEISA observations taken for functional testing, Radiometric Calibration, Solar Illumination Assembly Flat Field, and Arrokoth Encounter operations, including a test of a slow scan rate. Many LEISA Composition and System Scans along with some LEISA Scans as a LORRI Rider."

## LORRI Bundle

* For the following expected versioned data products, update the label VID from 1.0 to 2.0, and add modification\_history mentioning redownlinked/completed? data and reprocessed labels.
  + \* urn:nasa:pds:nh\_lorri:kem1\_raw:lor\_0408617170\_0x630\_eng::1.0
  + \* urn:nasa:pds:nh\_lorri:kem1\_raw:lor\_0408617171\_0x630\_eng::1.0
  + \* urn:nasa:pds:nh\_lorri:kem1\_raw:lor\_0408617244\_0x630\_eng::1.0
  + \* urn:nasa:pds:nh\_lorri:kem1\_raw:lor\_0408617245\_0x630\_eng::1.0
  + \* urn:nasa:pds:nh\_lorri:kem1\_cal:lor\_0408617170\_0x630\_sci::1.0
  + \* urn:nasa:pds:nh\_lorri:kem1\_cal:lor\_0408617171\_0x630\_sci::1.0
  + \* urn:nasa:pds:nh\_lorri:kem1\_cal:lor\_0408617244\_0x630\_sci::1.0
  + \* urn:nasa:pds:nh\_lorri:kem1\_cal:lor\_0408617245\_0x630\_sci::1.0

## MVIC Bundle

* [NONE]

## PEPSSI Bundle

* For the following expected versioned data products, update the label VID from 1.0 to 2.0, and add modification\_history mentioning additional (?) data and reprocessed labels.
  + kem1\_\*/pep\_0408261117\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0408347517\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0510990716\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0511077116\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0511163516\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0511249916\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0511336316\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0511422716\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0511509116\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0511595516\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0511681916\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0511768316\_0x691\_{eng,sci}.lblx
  + kem1\_\*/pep\_0511854716\_0x691\_{eng,sci}.lblx

## REX Bundle

* Typo in bundle.lblx Reference\_List entry for urn:nasa:pds:nh\_documents:sdc comment: "REX" => "SDC"

## SDC Bundle

* directory: 'calibration\_files/'
  + Released v1.0 of this collection is formatted differently, splitting tables by channel, and not naming them quite the same way. Coordination between NH SOC and SBN needed to sort out how to version things and relate them to the new tables.
    - Review version (v2.0) has only 3 calibration products verse 42 tables (and one condensed source file) in released v1.0.
* Add the missing Bundle\_Member\_Entry values.

## SWAP Bundle

* For the bundle.lblx Citation\_Information.description, it is recommended to replace with the v1.0 text:  
   This bundle contains collections of raw and calibrated data from the   
   Solar Wind Around Pluto (SWAP) instrument onboard the New Horizons  
   spacecraft, as well as a data summary plots collection, a calibration collection   
   of ancillary files used to calibrate the data from raw to calibrated, and a  
   trajectory collection with the New Horizons (NH) spacecraft trajectory   
   in various reference frames.
* For the following expected versioned data products, update the label VID from 1.0 to 2.0, and add modification\_history mentioning additional (?) data and reprocessed labels.
  + urn:nasa:pds:nh\_swap:kem1\_raw:swa\_0513129600\_0x585\_eng::1.0
  + urn:nasa:pds:nh\_swap:kem1\_raw:swa\_0513216000\_0x585\_eng::1.0
  + urn:nasa:pds:nh\_swap:kem1\_raw:swa\_0513302400\_0x585\_eng::1.0
  + urn:nasa:pds:nh\_swap:kem1\_raw:swa\_0513388800\_0x585\_eng::1.0
  + urn:nasa:pds:nh\_swap:kem1\_raw:swa\_0513475200\_0x585\_eng::1.0
  + urn:nasa:pds:nh\_swap:kem1\_raw:swa\_0513561600\_0x585\_eng::1.0