Solar Wind Around Pluto
SWAP

PRINCIPAL INVESTIGATOR
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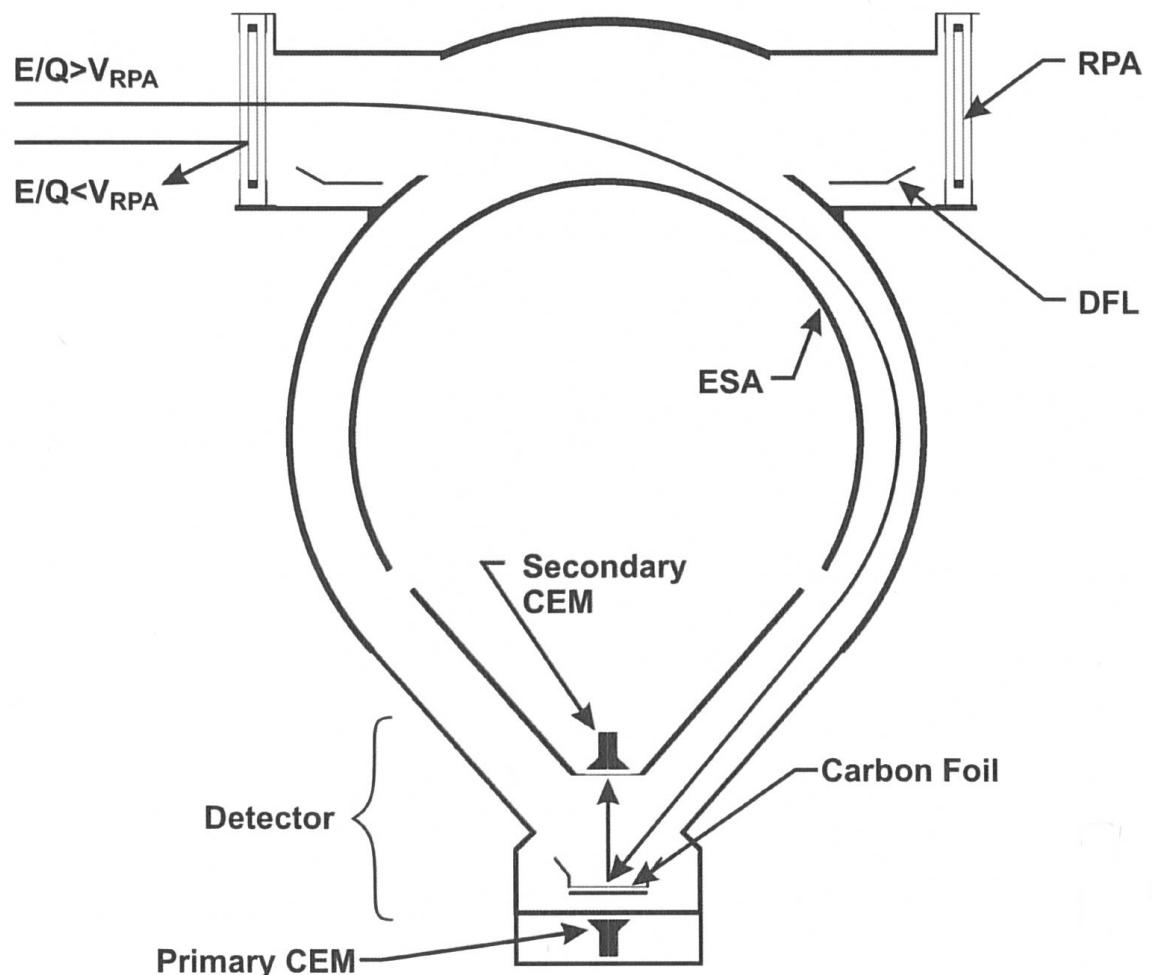
DESCRIPTION
Low Energy Plasma Instrument

ENERGY RANGE
30 eV - 7.7 keV

FIELD OF VIEW
270 deg x 10 deg
(deflection angles up to +15 deg)

ENERGY RESOLUTION
1 eV (< 2 keV); 9% (> 2 keV)

SPECIES
All Ions

$E/Q > V_{RPA}$

$E/Q < V_{RPA}$

RPA

DFL

ESA

Secondary CEM

Carbon Foil

Detector

Primary CEM

New Horizons SWAP Data Sets

RAW ->

nh-j-swap-2-jupiter-v3.0
nh-x-swap-2-plutocruise-v2.0

CALIBRATED ->

nh-j-swap-3-jupiter-v3.0
nh-x-swap-3-plutocruise-v2.0

New Horizons SWAP
Data Set Evaluation Tools

Staging and Evaluation -
   Machine: Dell Precision T3400
   Operating System: Fedora 18 linux

Data Processing -
   Machine: Sun Ultra-350
   Operating System: Sun Solaris OS 5.9

Minor Diagnostics -
   Machine: IBM lenovo T60p ThinkPad
   Operating System: Fedora 20 linux

Documentation Evaluation

Inconsistent File Name Definition

► Inconsistent definition of file names in aareadme.txt and catalog/dataset.cat

From catalog/dataset.cat (agrees with the ICD):

```
Filename/Product IDs
--------------------

The filenames and product IDs of observations adhere to a
common convention e.g.

ALI_0123456789_0X0AB_ENG_1.FIT
^^^ ^^^^^^^^^^ ^^^^^ ^^^ ^\___/
 |       |       |   |  |  ^^
 |       |       |   |  |   |
 |       |       |   |  |   +--File type (includes dot)
 |       |       |   |  |       - .FIT for FITS file
 |       |       |   |  |       - .LBL for PDS label
 |       |       |   |  |       - not part of product ID
 |       |       |   |  |
 |       |       |   |  +-- Version number from the SOC
 |       |       |   |         (Science Operations Center)
 |       |       |   |
 |       |       |   +--ENG for CODMAC Level 2 data *
 |       |       |       SCI for CODMAC Level 3 data *
 |       |       |
 |       |       +--Application ID (ApID) of the telemetry data
 |       |           packet from which the data come
 |       |
 |       +--MET (Mission Event Time) i.e. Spacecraft Clock
 |
 +--Instrument designator
```

Inconsistent File Name Definition - 2

From aareadme.txt (agrees with the document aareadme_bu):

```
Data Filenames and Product IDs
==============================

The filenames of data files and the Product IDs of observations adhere
to a common convention e.g.

        ALI_0123456789_0X0AB_ENG_1.FIT
        ^^^ ^^^^^^^^^^ ^^^^^ ^^^ ^\__/
         |      |        |    |  |  ^^
         |      |        |    |  |   |
         |      |        |    |  |   +--File type (includes dot)
         |      |        |    |  |       - .FIT for FITS file
         |      |        |    |  |       - .LBL for PDS label
         |      |        |    |  |       - not part of Product ID
         |      |        |    |  |
         |      |        |    |  +-- Version number; SOC-internal
         |      |        |    |       (Science Operations Center)
         |      |        |    |       (see Note FN1)
         |      |        |    |
         |      |        |    +--ENG for Raw data
         |      |        |       SCI for Calibrated data
         |      |        |      (see Note FN1)
         |      |        |
         |      |        +--Application ID (ApID) of the telemetry data
         |      |            packet from which the data come (see Note FN2)
         |      |
         |      +--Spacecraft Receipt Mission Elapsed Time (SCRMET)
         |
         +--Instrument/observation designator
```

Inconsistent File Name Definition - 3

From aareadme.txt:

> Note that, depending on the observation, the SCRMET in the data
> filename and in the Product ID may be similar to the Mission Elapsed Time
> (MET) of the actual observation acquisition, but should not be used as an
> analog for the acquisition time. The SCRMET is the time that the data
> are transferred from the instrument to spacecraft memory and is therefore
> not a reliable indicator of the actual observation time. The PDS label

Note that MET is not the same as SCRMET.

The ICD makes no reference to SCRMET.

nh-x-pepssi-2-plutocruise-v1.0/catalog
nh-x-pepssi-3-plutocruise-v1.0/catalog
nhsc.cat

► Unable to locate Figure 5:

```
The 16 rocket engine assemblies (REAs) are organized into 8 sets and
placed on the spacecraft as shown in Figure 5. Pairs of the 0.8N
```

► Unable to locate Table II:

```
rates allowed during this operation mode. Control rates for each of
the spacecraft axes are shown below in Table II. One pair of the 4.4N
```

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
catalog/ref.cat

► Incomplete Journal Specification:

```
OBJECT               = REFERENCE
  REFERENCE_KEY_ID   = "ANDREWSETAL1998"
  REFERENCE_DESC     = "
Andrews, G.B., Robert E. Gold, Edwin P. Keath, Donald G. Mitchell, Richard W.
McEntire, Ralph L. McNutt, Jr., Nicholas P. Paschalidis, Compact particle
detector for space measurements: prototype performance, Proceedings Vol. 3442
Missions to the Sun II, Clarence M. Korendyke, Editors, pp.105-114, 1998.
  "
END_OBJECT           = REFERENCE
```

Should site "Proceedings SPIE" as the journal.

► Incorrect Reference Year:

```
OBJECT               = REFERENCE
  REFERENCE_KEY_ID   = "BELTONETAL2002"
  REFERENCE_DESC     = "
Belton, M. J., et al., New Frontiers in the Solar System. An Integrated
Exploration Strategy, National Research Council, 145 pp, 2002.
  "
END_OBJECT           = REFERENCE
```

Can not find a 2002 reference which has more than 100
pages. There is a 2003 reference which exceeds 145
pages.

# nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ catalog/ref.cat - 2

► SwRI library unable to locate the following references:

```
OBJECT                    = REFERENCE
  REFERENCE_KEY_ID  = "DSN810-5"
  REFERENCE_DESC      = "
Deep Space Network / Flight Project Interface Design Book, JPL-D-810-5, Jet
Propulsion Laboratory, Pasadena, CA 2003.
  "
END_OBJECT               = REFERENCE

OBJECT                    = REFERENCE
  REFERENCE_KEY_ID  = "DSN821-104"
  REFERENCE_DESC      = "
Deep Space Mission Systems, Tracking and Navigation Service, Requirements and
Design, DSMS No. 821-104, Rev. B, JPL D-17235, Jet Propulsion Laboratory,
Pasadena, CA, 2003.
  "
END_OBJECT               = REFERENCE

OBJECT                    = REFERENCE
  REFERENCE_KEY_ID  = "DSN821-110"
  REFERENCE_DESC      = "
Deep Space Mission Systems, Radio Science Service, Requirements and Design,
DSMS No. 821-110, Rev. A, JPL D-17241, Jet Propulsion Laboratory, Pasadena,
CA, 2001.
  "
END_OBJECT               = REFERENCE
```

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ document/ soc_inst_icd_intro.pdf and soc_inst_icd_acroabbr.pdf

A test was conducted on the ICD intro pdf to determine if an acronym was included within the ICD acroabbr pdf file. The acronym chosen was "CM" and occurs on page 6, section 6.6, line 3 of the ICD intro pdf. This acronym was not found in the acroabbr pdf file.

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ document/ soc_inst_icd_swap.pdf
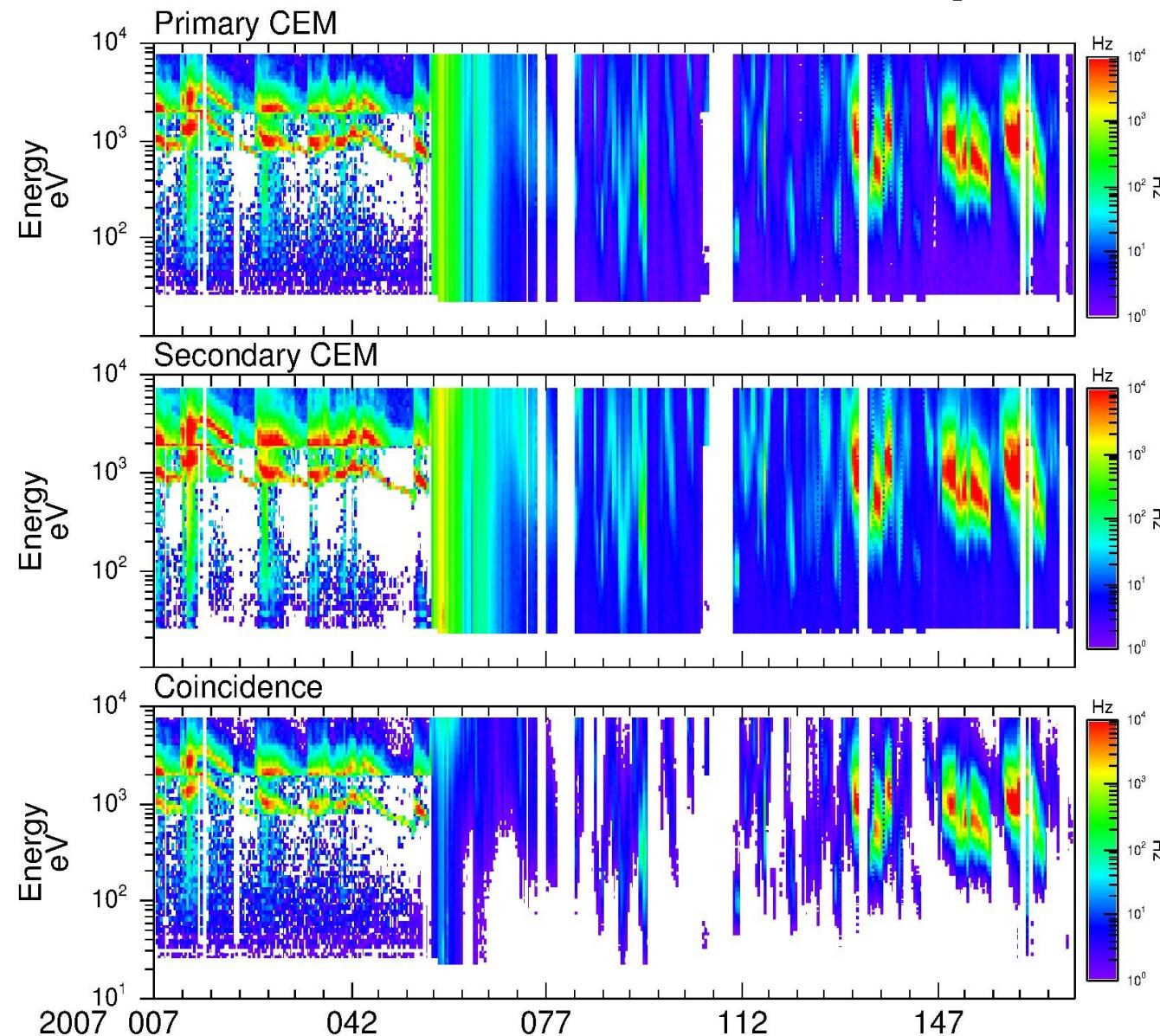
► On page 133, there is an incorrect reference to the level 3 Figure 14-7 when it should be to the level 2 Figure 14-5.

► The file SWAP_level2_C_IdL_10152012.pdf was not found; however, it was unclear if this file should be in the archive (last line of section 14.8).

Data Evaluation
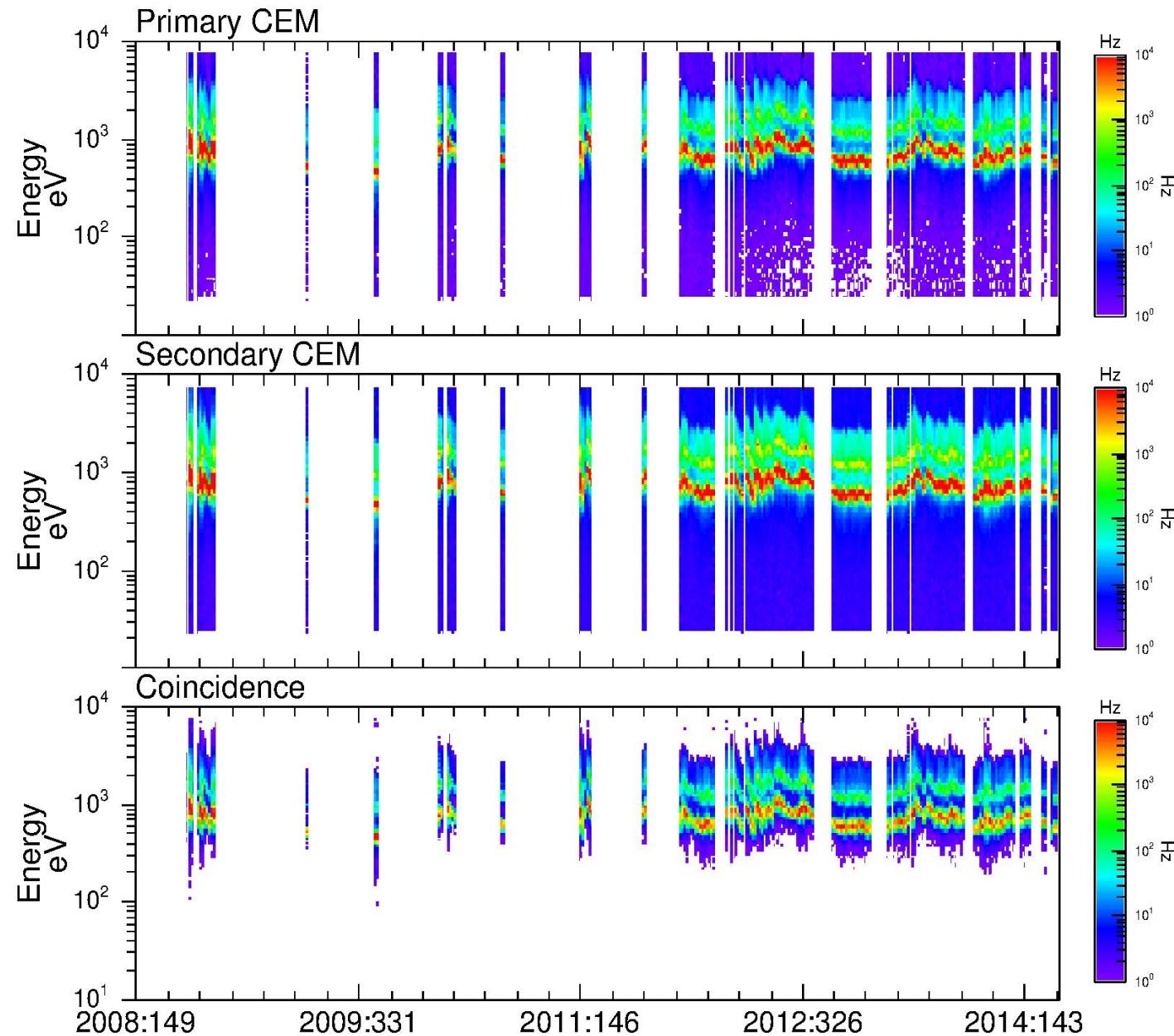
Science Data Samples

As a special note, the science data samples plots in the document/data_summary_plots were very helpful as the evaluator had issues with the FITS Viewer (FV).

SWAP Science - Jupiter

SWAP Science Pluto Cruise

Back-Up Slides

nh-j-swap-2-jupiter-v3.0
nh-j-swap-3-jupiter-v3.0
nh-x-swap-2-plutocruise-v2.0
nh-x-swap-3-plutocruise-v2.0
errata.txt

GOOD

nh-j-swap-2-jupiter-v3.0
nh-j-swap-3-jupiter-v3.0
nh-x-swap-2-plutocruise-v2.0
nh-x-swap-3-plutocruise-v2.0
voldec.cat

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ catalog/catinfo.txt

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ catalog/swap.cat

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ catalog/nh.cat

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
catalog/dataset.cat

► See note on Inconsistent File Name Definition

► Minor Corrections Sent to PDS/SBN

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ calib/calinfo.txt

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
calib/ rpa_shape.lbl and rpa_shape.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
calib/ list_energy_files.lbl and list_energy_files.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
calib/ fov_mask_2d.lbl and fov_mask_2d.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
calib/ esa_shape.lbl and esa_shape.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ calib/ esa_rpa_v19_energy_binsf_new2.lbl and esa_rpa_v19_energy_binsf_new2.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
calib/ esa_rpa_v18_energy_binsf_new.lbl and
esa_rpa_v18_energy_binsf_new.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ calib/ esa_rpa_v16_energy_binsf_new.lbl and esa_rpa_v16_energy_binsf_new.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ calib/ background_009_dac.lbl and background_009_dac.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ calib/ background_009_dac_jup.lbl and background_009_dac_jup.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
document/ aareadme_bu.txt

► See note on Inconsistent File Name Definition

► Minor Corrections Sent to PDS/SBN

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
document/ docinfo.txt

► See note on Inconsistent File Name Definition

► Minor Corrections Sent to PDS/SBN

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ document/ lunineetal1995.lbl and lunineetal1995.pdf

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ document/ nh_fov.lbl and nh_fov.png

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
document/ nh_met2utc.lbl and nh_met2utc.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ document/ nh_mission_trajectory.lbl and nh_mission_trajectory.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ document/ nh_trajectory.lbl and nh_trajectory.tab

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ document/ payload_ssr.lbl and payload_ssr.pdf

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
document/ pdsdd_insert_newhorizons.txt

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/,
nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/
document/ quat_axyz_instr_to_j2k.lbl and
quat_axyz_instr_to_j2k.asc

GOOD

nh-j-swap-2-jupiter-v3.0/, nh-j-swap-3-jupiter-v3.0/, document/ seq_swap_jupiter.lbl and seq_swap_jupiter.tab

GOOD

nh-x-swap-2-plutocruise-v2.0/, nh-x-swap-3-plutocruise-v2.0/ document/ seq_swap_plutocruise.lbl and seq_swap_plutocruise.tab

GOOD