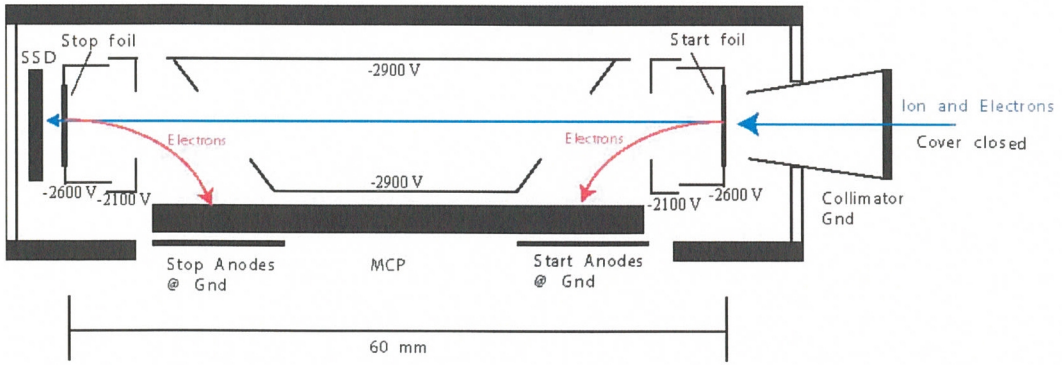
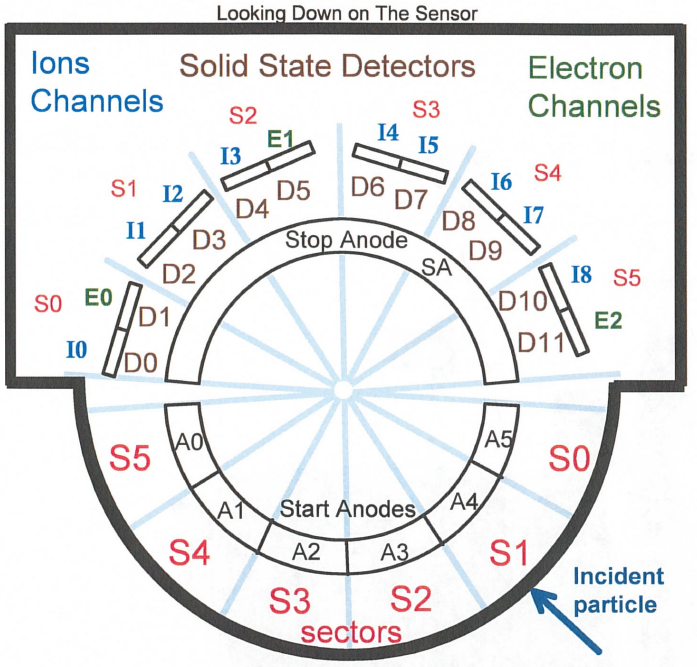
New Horizons
Pluto Energetic Particle Spectrometer Science Investigation (PEPSSI)

PRINCIPAL INVESTIGATOR: Ralph McNutt, APL
DESCRIPTION: Medium Energy Particle Spectrometer
ENERGY RANGE: 25-1000 keV (protons)
60-1000 keV (atomic ions)
25-500 keV (electrons)

FIELD OF VIEW: 160 deg x 12 deg
ANGULAR RESOLUTION: 25 deg x 12 deg
ENERGY RESOLUTION: 0.25 keV
SENSOR SIZE: 7.6 cm dia. x 2.5 cm thick
POWER: 1.4 watt
MASS: 1.5 kg





New Horizons PEPSSI Data Sets

L5 Data Sets:
nh-p-pepssi-5-plasma-v1.0

New Horizons PEPSSI Data Set Evaluation Tools

Staging and Evaluation -

Machine: Dell Precision T3400

Operating System: Fedora 18 linux

Staging and Minor Diagnostics -

Machine: IBM lenovo T60p ThinkPad

Operating System: Fedora 27 linux

Documentation Evaluation

nh-p-pepssi-5-plasma-v1.0
voldesc.txt

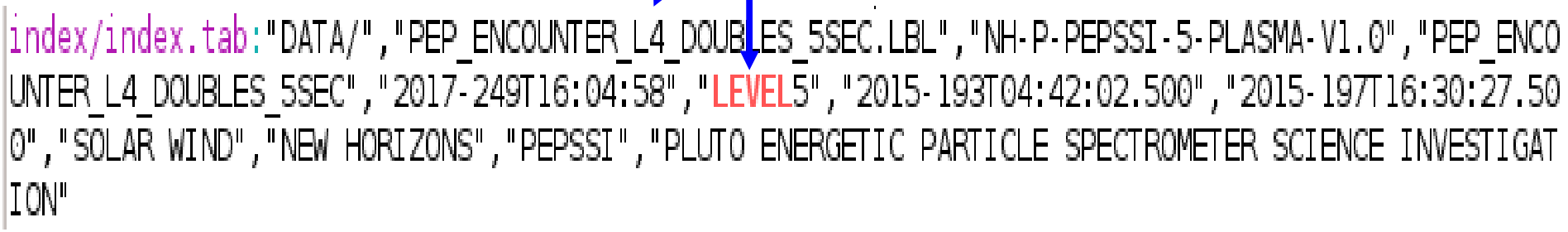
```
VOLUME_ID                = "NHPEDP_0005"
VOLUME_FORMAT            = "ISO-9660_LEVEL2"
VOLUME_VERSION_ID        = "VERSION 1"
```

Level 2?

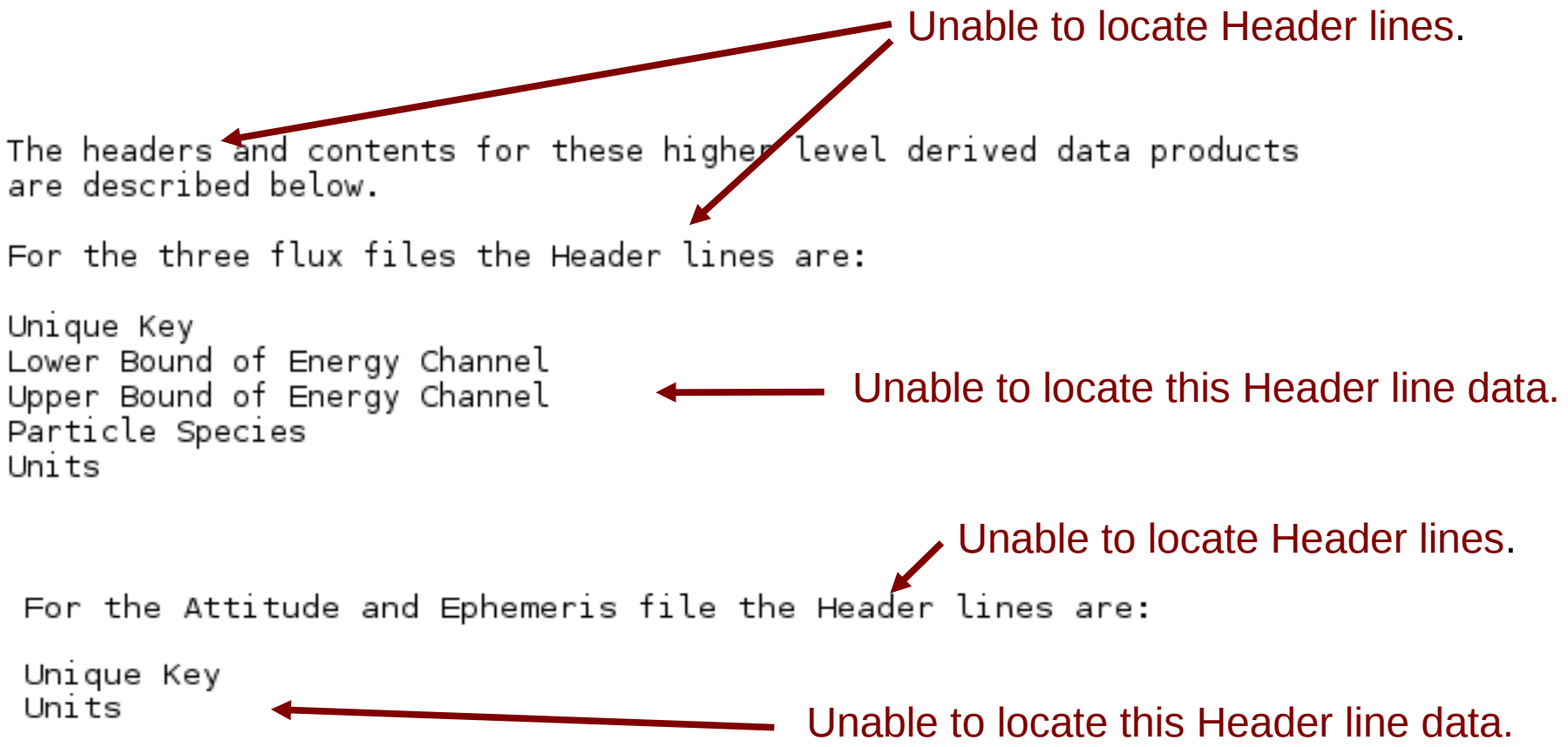
This looks odd to me...

nh-p-pepssi-5-plasma-v1.0/index
index.lbl & index.tab

Not sure why Level 4 and Level 5 are mixed



nh-p-pepssi-5-plasma-v1.0/catalog
dataset.cat – 1 of 2



nh-p-pepssi-5-plasma-v1.0/catalog
dataset.cat – 2 of 2

The file pep_encounter_l4_attitude_and_ephemeris.csv includes these
Attitude and Ephemeris quantities at 1s cadence:

PEPSSI S1 Pluto Cone Angle
PEPSSI S1 Pluto Clock Angle
PEPSSI S1 Sun Clock Angle
PEPSSI S1 Sun Clock Angle
PSH X
PSH Y
PSH Z
PSH R
SC-Sun-Pluto Line
HCI R (distance to the Sun)

Unable to Locate Pluto Angle Definitions.

Unable to Locate Sun Angle Definitions..

Unable to Locate PSH Definition and a Description of the PSH Coordinate Frame.

Unable to Locate Description of Definition of this Quantity.

Further details about the New Horizons mission can be found in the
companion document dataset:

NH-P-MULTI-6-DOC-SET-V1.0

Unable to Locate this Dataset.

Question: Why is the data set labeled with Level 5, yet the data files labeled with L4?

nh-p-pepssi-5-plasma-v1.0/catalog
pepssi.cat

```
Please refer to dataset.cat for additional details on the applicability
and use of the Primary HDU and extensions of data products in this
dataset.
```

No discussion is included about HDU's in the dataset.cat file. This Is left over text from a FITs file description. It does not apply to this dataset since there are only CSV data files included in this archive.

nh-p-pepssi-2-pluto-v3.0/document
nh-p-pepssi-3-pluto-v3.0/document
soc_inst_icd.pdf

Note – This document does not describe the files included in this archive, the data included in this archive, or the file formats of data in this archive. This document does not describe or mention any data products beyond Level 3. There is no definition of attitude parameters or coordinate systems included in this document.

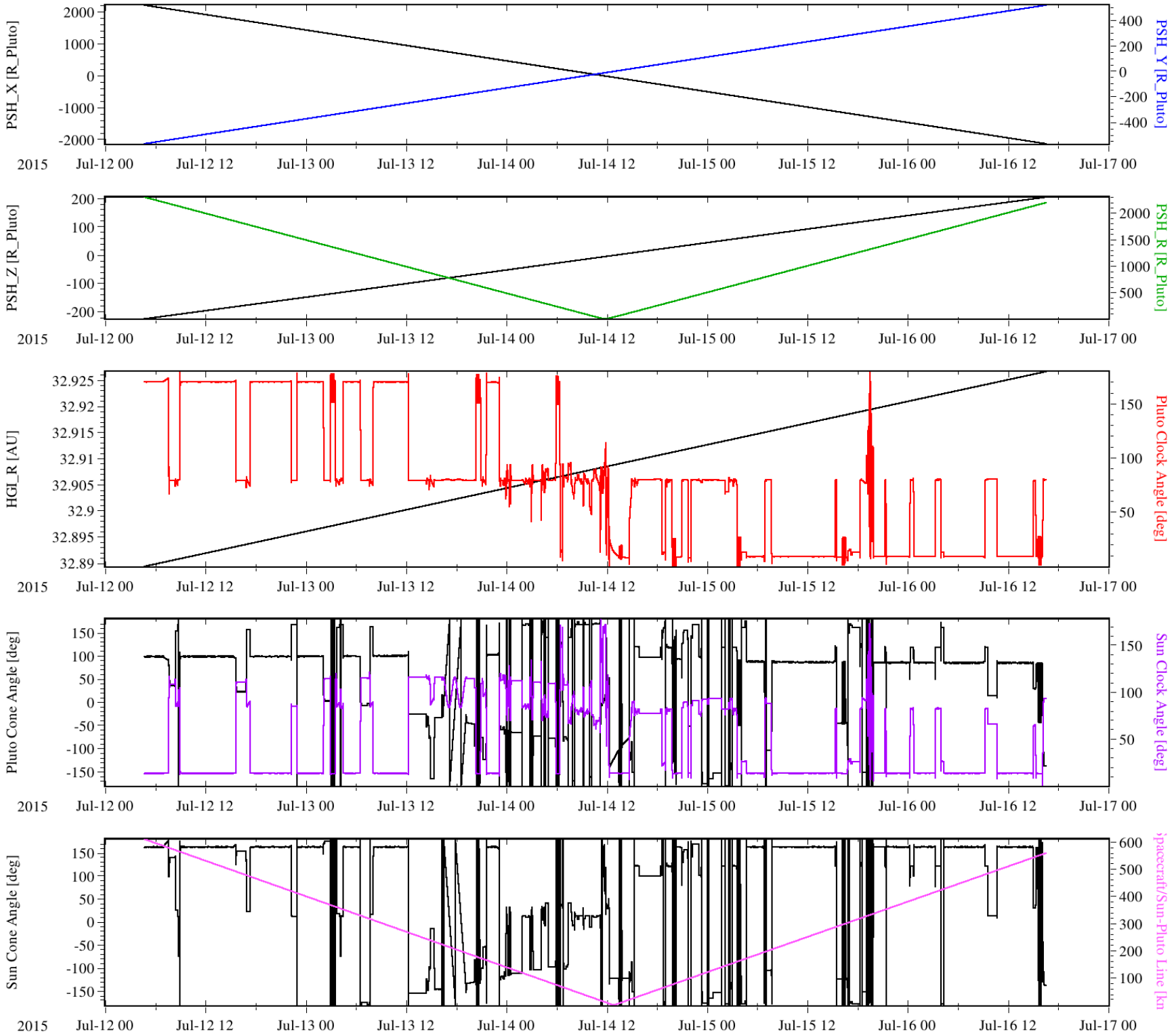
Additional Comment

The data in this archive is in the same units as the Level 3 data, but I can find no explanation of what makes this Level 4/5 product different than the Level 3 data product. It is not obvious. Is this just resampled data? If so, why is it important for the science community?

Data Evaluation

Attitude CVS Data

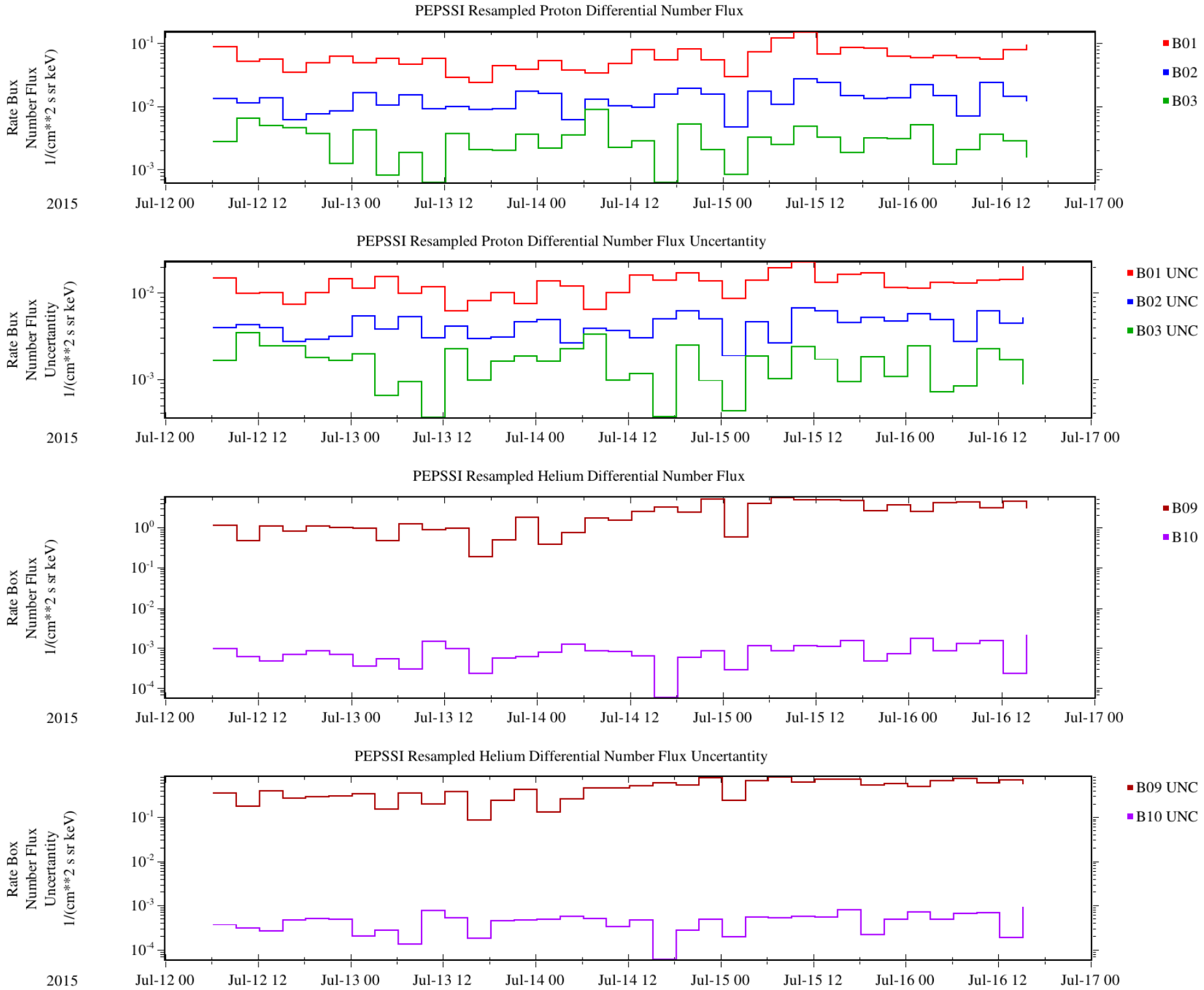
The contents of the attitude data file was examined. These data show the PSH radius increases with increasing distance from Pluto. It shows that the HGI radius continues to increase through out the time period. Not sure what the other values should show; however, it looks like big changes in angles may be due to spacecraft rolls.



Plot created by SDDAS/gPlot - J. Mukherjee, et al. Generated on Sun May 6 18:15:36 2018.

Triples CVS Data

The contents of the triples data file was examined. These data show that the lower energy H+ number flux and the lower energy He+ number flux both increase after the Pluto encounter.

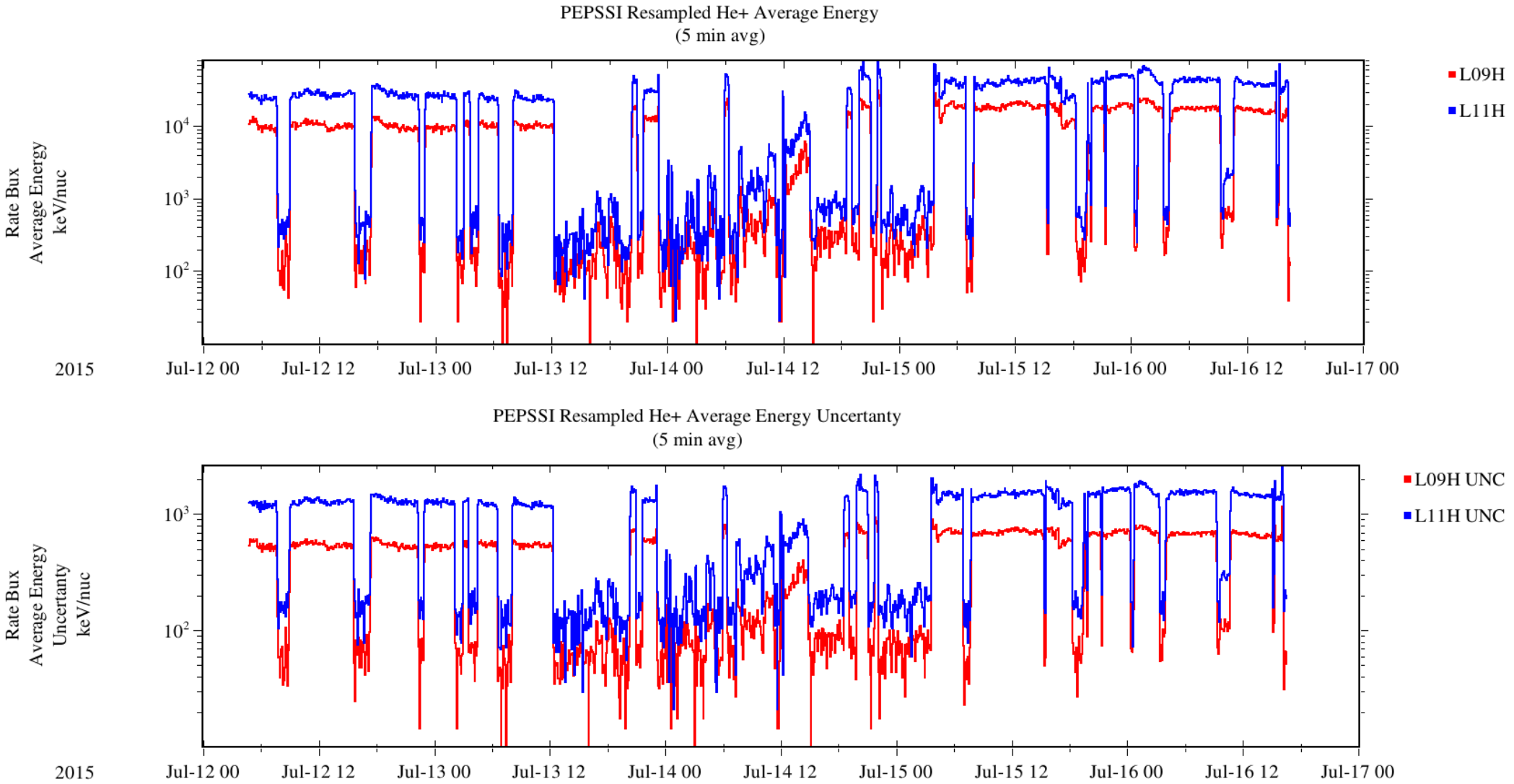


Plot created by SDDAS/gPlot - J. Mukherjee, et al. Generated on Sun May 6 18:13:38 2018.

Doubles CVS Data

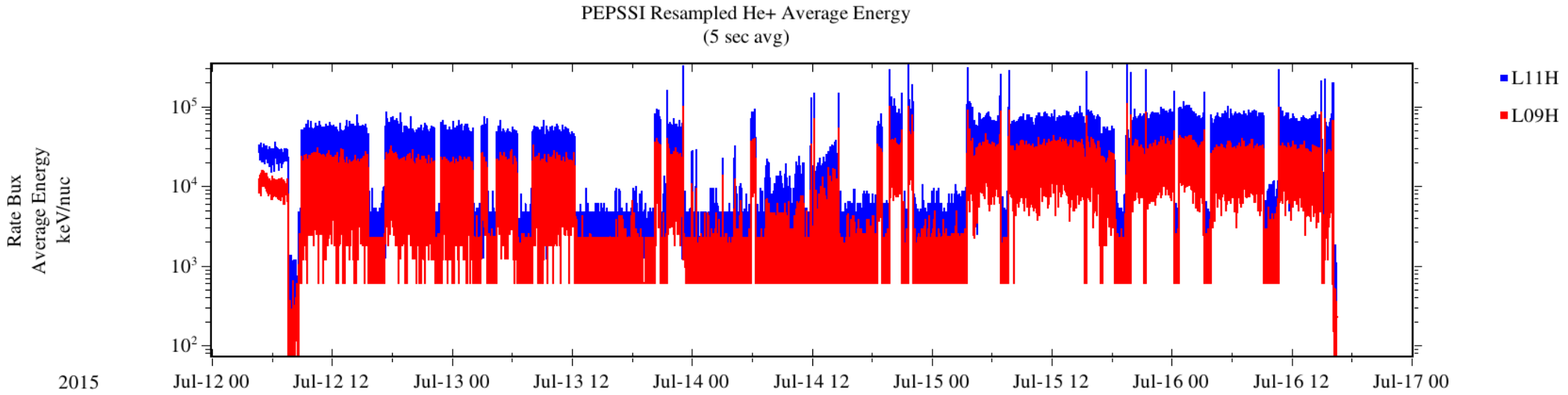
There are two types of doubles cvs files and the difference in them is one is at time resolution of 5 min and the other is at a time resolution of 5 sec. The contents of both doubles data file were examined. Data files show values expected for averaging these data.

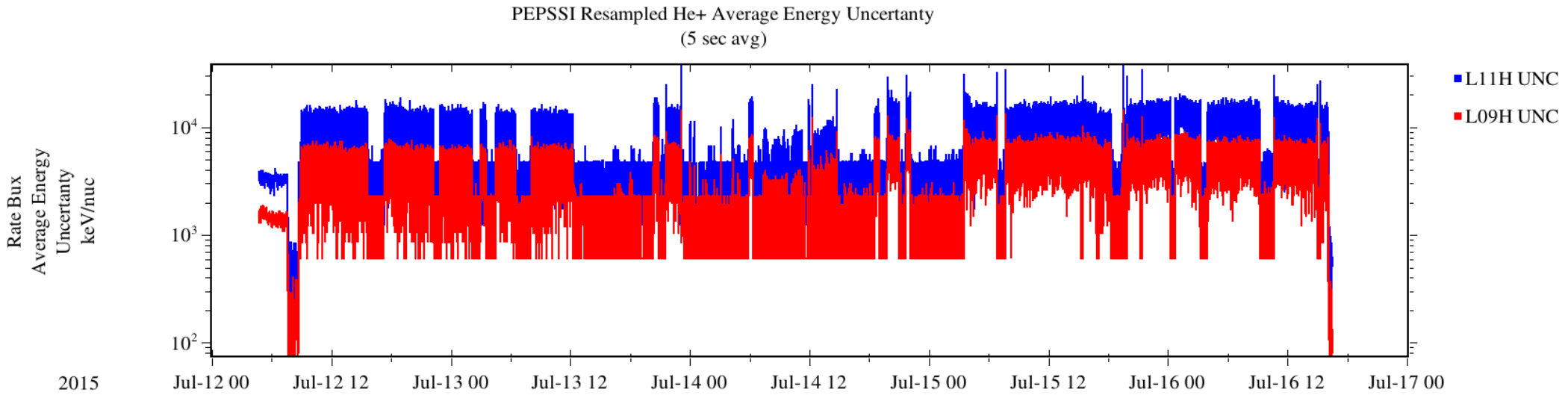
5 min Resolution



Plot created by SDDAS/gPlot - J. Mukherjee, et al. Generated on Sun May 6 18:29:26 2018.

5 sec Resolution



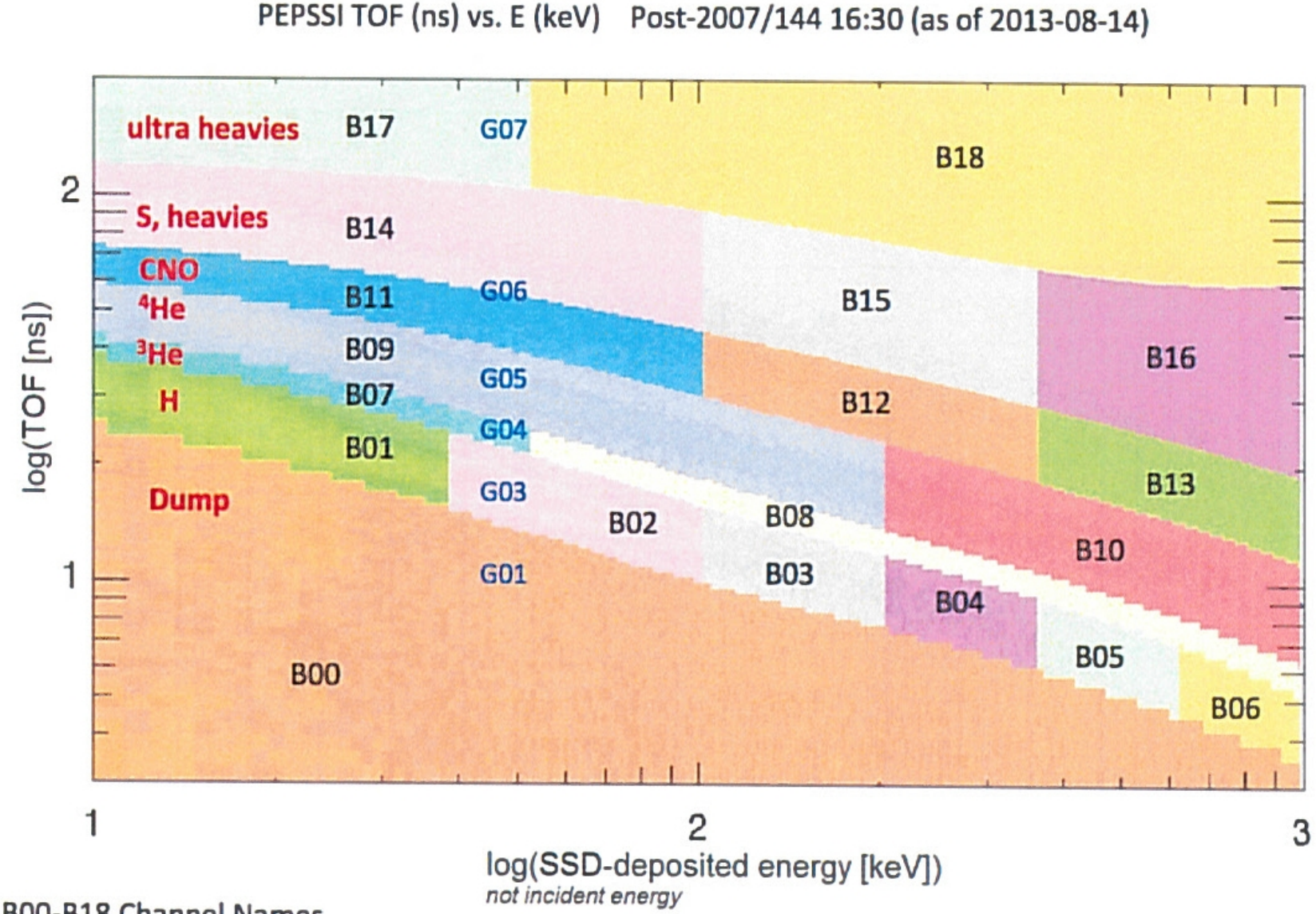


Plot created by SDDAS/gPlot - J. Mukherjee, et al. Generated on Sun May 6 18:32:14 2018.

Certification

In order for a scientist to understand the data presented, the documentation needs to be clear. There are substantial gaps in the documentation that the data should not be released at this time.

Back-Up Slides



(b) B00-B18 Channel Names
G01, G03-G07 Priority Groups (by species)

Figure 11-6: PEPSSI Rate Boxes on the TOF vs Energy Plane. Normal Mode. (a) Boxes until 2007 DOY 144; (b) boxes after this time.

nh-p-pepssi-5-plasma-v1.0
aareadme.txt

GOOD

nh-p-pepssi-5-plasma-v1.0/index
indxinfo.txt

GOOD

nh-p-pepssi-5-plasma-v1.0/index
checksum.lbl & checksum.tab

GOOD

nh-p-pepssi-5-plasma-v1.0/catalog
catinfo.txt

GOOD

nh-p-pepssi-5-plasma-v1.0/catalog
nh.cat

GOOD

nh-p-pepssi-5-plasma-v1.0/catalog
nhsc.cat

GOOD

nh-p-pepssi-5-plasma-v1.0/catalog
ref.cat

GOOD

nh-p-pepssi-5-plasma-v1.0/document
docinfo.txt

GOOD

nh-p-pepssi-5-plasma-v1.0/document
codmac_level_definitions.lbl
codmac_level_definitions.pdf

GOOD

nh-p-pepssi-5-plasma-v1.0/document
nh_met2utc.lbl & nh_met2utc.tab

GOOD

nh-p-pepssi-5-plasma-v1.0/document
payload_ssr.lbl & payload_ssr.pdf

GOOD

nh-p-pepssi-5-plasma-v1.0/document
pepssi_ssr.lbl & pepssi_ssr.pdf

GOOD

nh-p-pepssi-5-plasma-v1.0/document
nh_fov.lbl & nh_fov.png

GOOD

nh-p-pepssi-5-plasma-v1.0/document
nh_pepssi_v110_ti.txt

GOOD

nh-p-pepssi-2-pluto-v3.0/document
nh-p-pepssi-3-pluto-v3.0/document
soc_inst_icd.lbl

GOOD