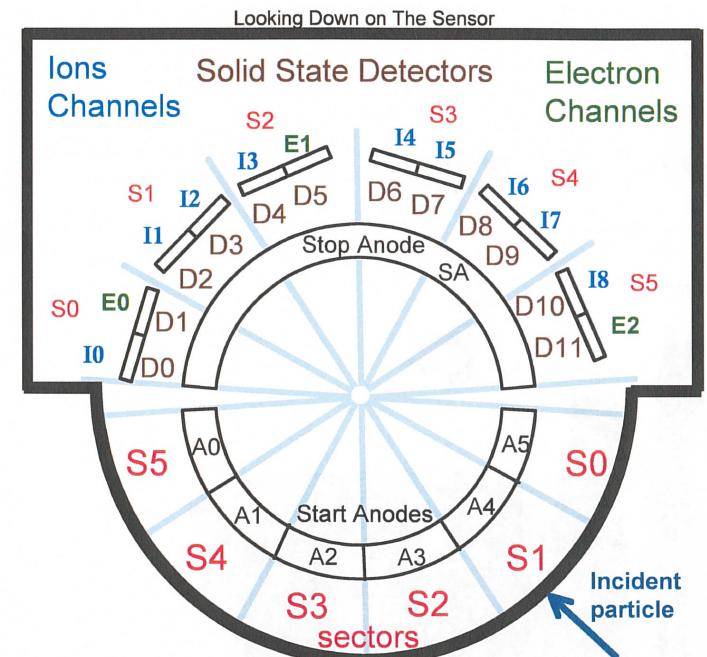
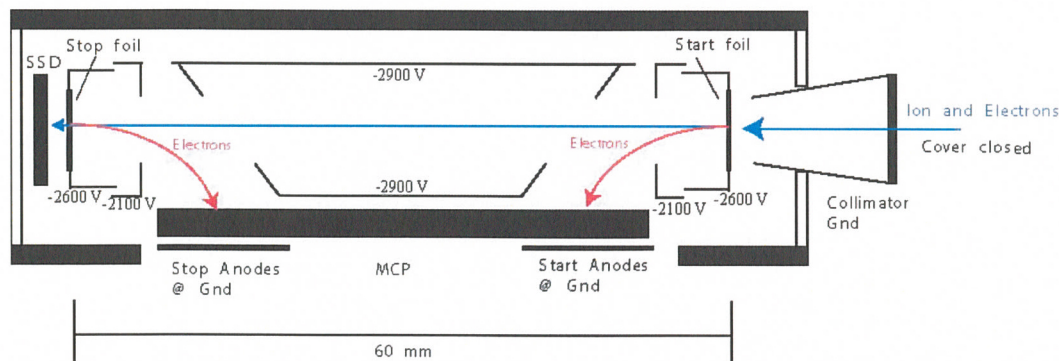


# New Horizons Pluto Energetic Particle Spectrometer Science Investigation (PEPSSI)

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

Delta of RESAMPLED Data Sets:  
nh-a-pepssi-4-kem1-v1.0

# New Horizons PEPSSI Data Set Evaluation Tools

Staging and Evaluation -

Machine: Dell Precision Tower 5810

Operating System: Rocky-8 linux

Data Processing -

Machine: Sun Ultra-350

Operating System: Sun Solaris OS 5.9

Minor Diagnostics -

Machine: Dell 7520

Operating System: Fedora 33 linux

# **PEPSSI RESAMPLED Documentation Evaluation**



nh-x-pepssi-4-plasma-v1.0  
aareadme.txt

GOOD

nh-x-pepssi-4-plasma-v1.0  
voldesc.txt

6

GOOD

nh-x-pepssi-4-plasma-v1.0/catalog  
catinfo.txt

GOOD

# nh-x-pepssi-4-plasma-v1.0/catalog dataset.cat

8

Missing "y"



Defining the various reduced data channels:

```
B<x>S<y> - a single instrument 'triple channel' with Energy Bin  
          number x and Sector (i.e. Look Direction) as defined  
          in the documentation for L2 and L3 data  
L<x>S<y> - a single instrument 'double channel' with Energy  
          (determined from time of flight and an assumed species)  
          Bin number x and Sector (i.e. Look Direction) as  
          defined in the documentation for L2 and L3 data
```

In this document, please include something like:  
"Time is given at the center of the 1 hour averaged window".

nh-x-pepssi-4-plasma-v1.0/catalog  
nh.cat

9

GOOD

# nh-x-pepssi-4-plasma-v1.0/catalog nh\_kem.cat

Has this not Completed?  
The Encounter has  
Already Occurred.

```
KEM Cruise1
-----
Short phase name (in DSID):  KEMCRUISE1
Formal mission phase name:  CRUISE TO FIRST KBO ENCOUNTER
Mission Phase Start Time - 2016-10-26
Mission Phase Stop Time  - 2018-08-14

Activities during the KEMCRUISE1 mission phase to the first KBO
encounter are similar to those for Pluto Cruise phase. They also
include post-Pluto encounter calibrations in mid-2016, along with
continuing download of data from the Pluto encounter.

The name and times chosen for this mission phase are still in flux
and may change in the future.
```

Isn't the mission now  
In the Encounter phase?

```
KEM 1 Encounter
-----
Short phase name (in DSID):  KEM1
Formal mission phase name:  KEM1 ENCOUNTER
Mission Phase Start Time - 2018-08-14
Mission Phase Stop Time  - TBD
```

nh-x-pepssi-4-plasma-v1.0/catalog  
nhsc.cat

11

GOOD

nh-x-pepssi-4-plasma-v1.0/catalog  
pepssi.cat

12

GOOD



nh-x-pepssi-4-plasma-v1.0/catalog  
ref.cat

13

GOOD

nh-x-pepssi-4-plasma-v1.0/document  
docinfo.txt

14

GOOD

nh-x-pepssi-4-plasma-v1.0/document  
codmac\_level\_definitions.lbl  
codmac\_level\_definitions.pdf

15

GOOD

nh-x-pepssi-4-plasma-v1.0/document  
nh\_met2utc.tbl  
nh\_met2utc.tab

16

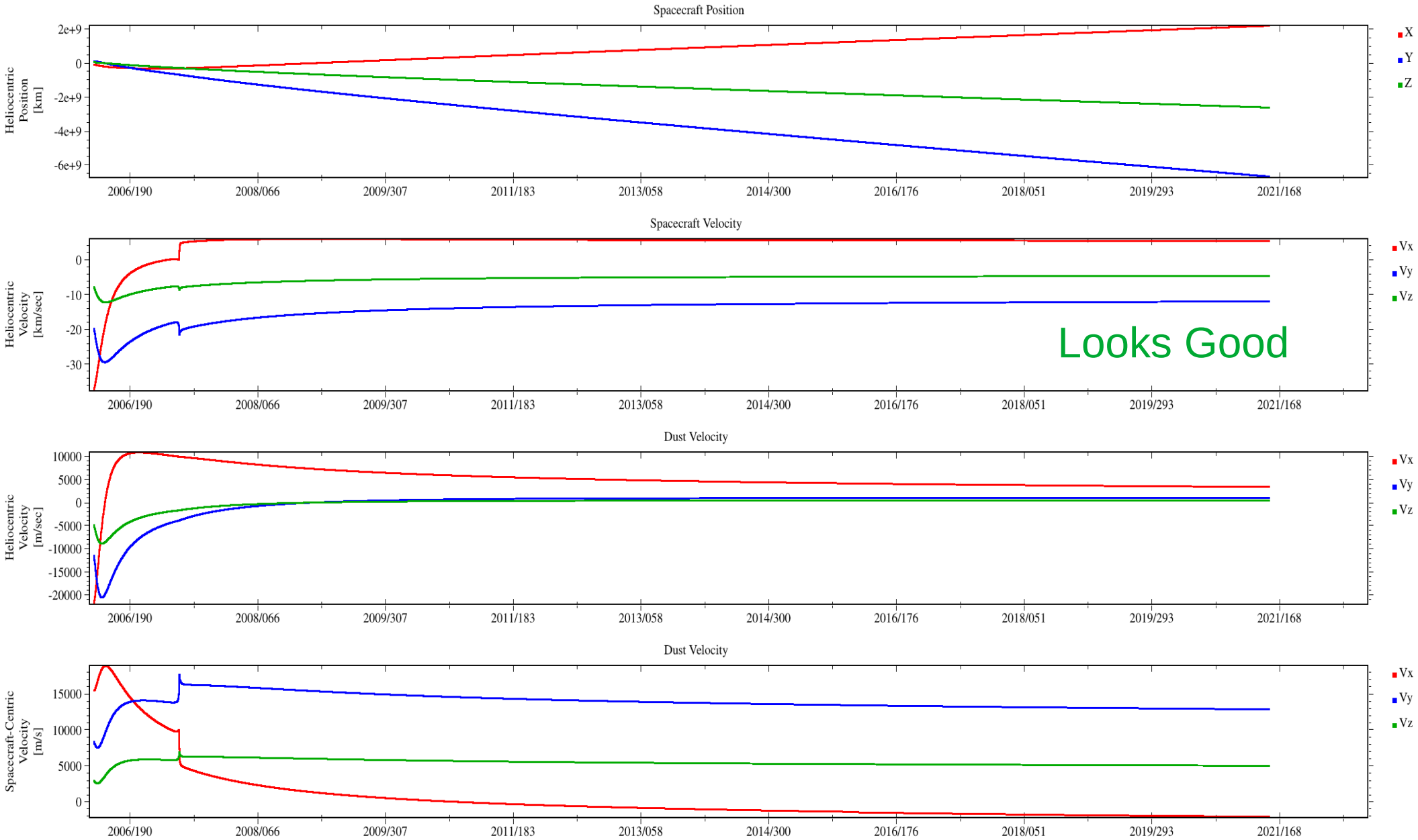
GOOD, updated

nh-x-pepssi-4-plasma-v1.0/document  
nh\_mission\_trajectory.tbl

17

GOOD, new

# nh-x-pepssi-4-plasma-v1.0/document nh\_mission\_trajectory.tab



nh-x-pepssi-4-plasma-v1.0/document  
payload\_ssr.lbl  
payload\_ssr.pdf

19

GOOD

nh-x-pepssi-4-plasma-v1.0/document  
pepssi\_ssr.lbl  
pepssi\_ssr.pdf

20

GOOD



nh-x-pepssi-4-plasma-v1.0/document  
pep\_bti.lbl  
pep\_bti.tab

21

GOOD, new

nh-x-pepssi-4-plasma-v1.0/document  
seq\_pepssi\_k4.lbl  
seq\_pepssi\_k4.tab

22

GOOD, new

nh-x-pepssi-4-plasma-v1.0/document  
soc\_inst\_icd.tbl  
soc\_inst\_icd.pdf

23

GOOD

nh-x-pepssi-4-plasma-v1.0/index  
indxinfo.txt

24

GOOD

nh-x-pepssi-4-plasma-v1.0/index  
index.lbl & index.tab

25

GOOD

nh-x-pepssi-4-plasma-v1.0/index  
checksum.tbl & checksum.tab

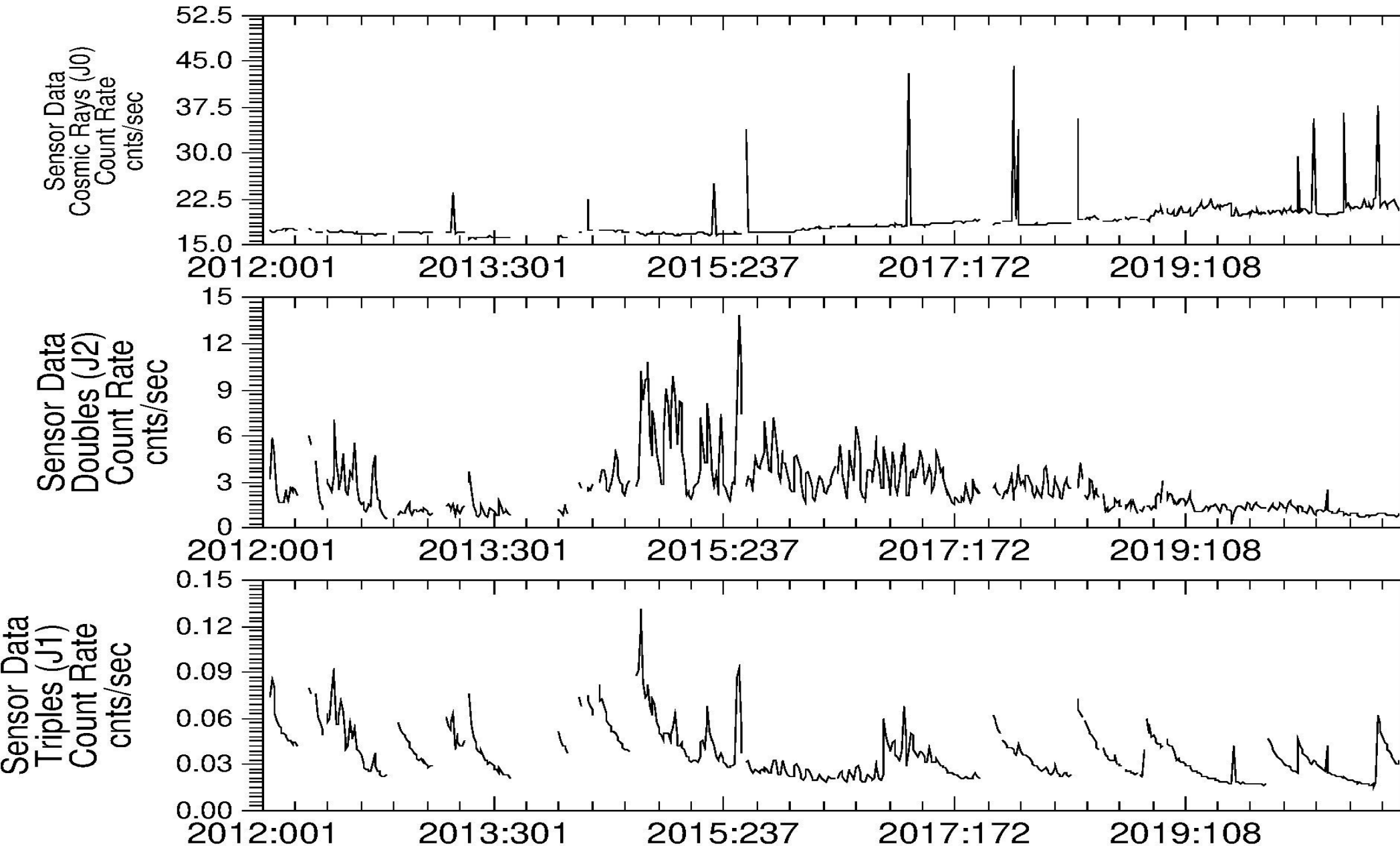
26

GOOD

# **PEPSSI RESAMPLED Data Evaluation**

# nh-x-pepssi-4-plasma-v1.0/data

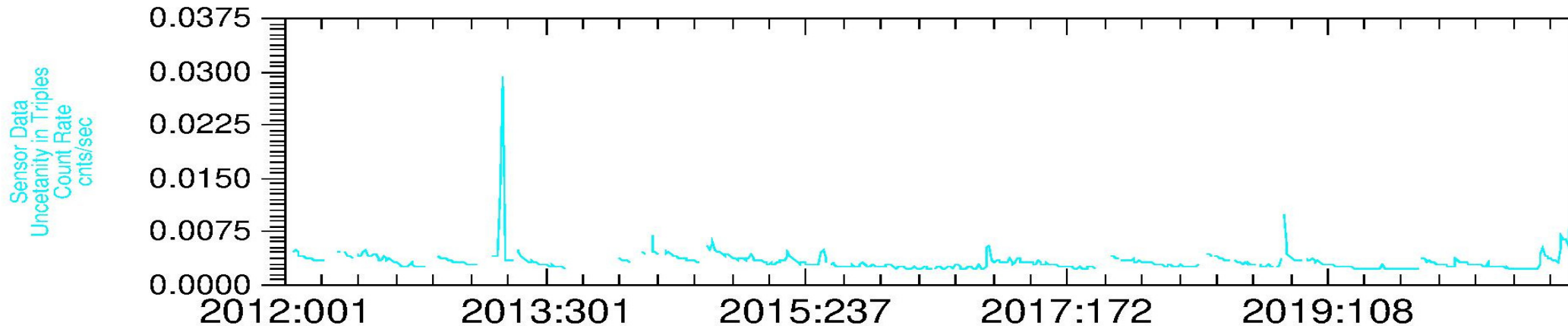
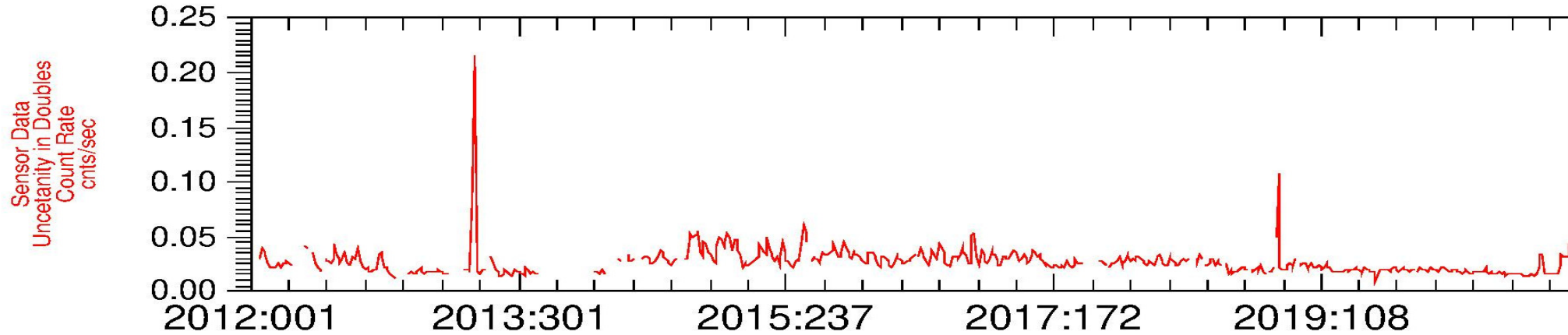
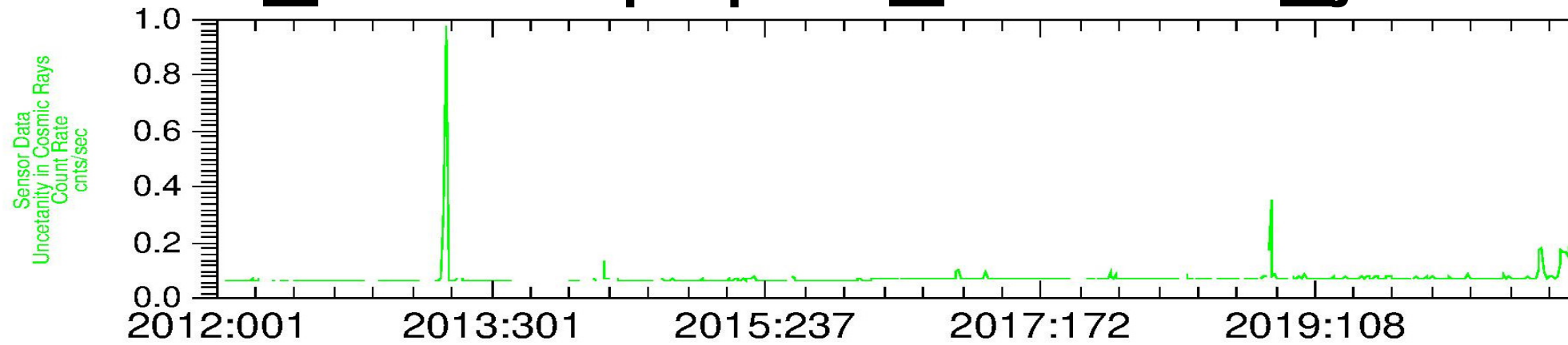
## total\_counts/pepssi\_reduced\_j\*





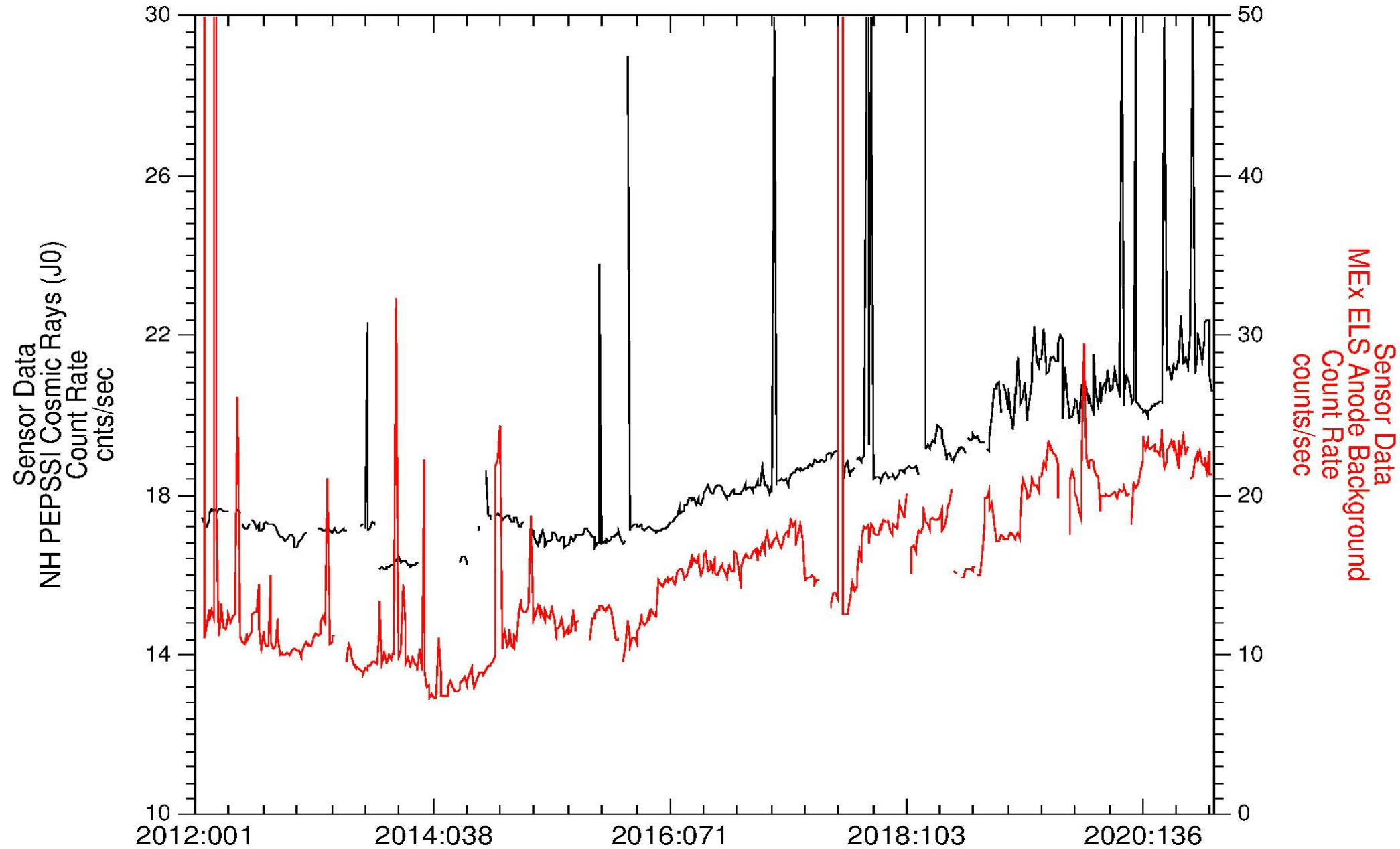
# nh-x-pepssi-4-plasma-v1.0/data

## total\_counts/pepssi\_reduced\_j\*

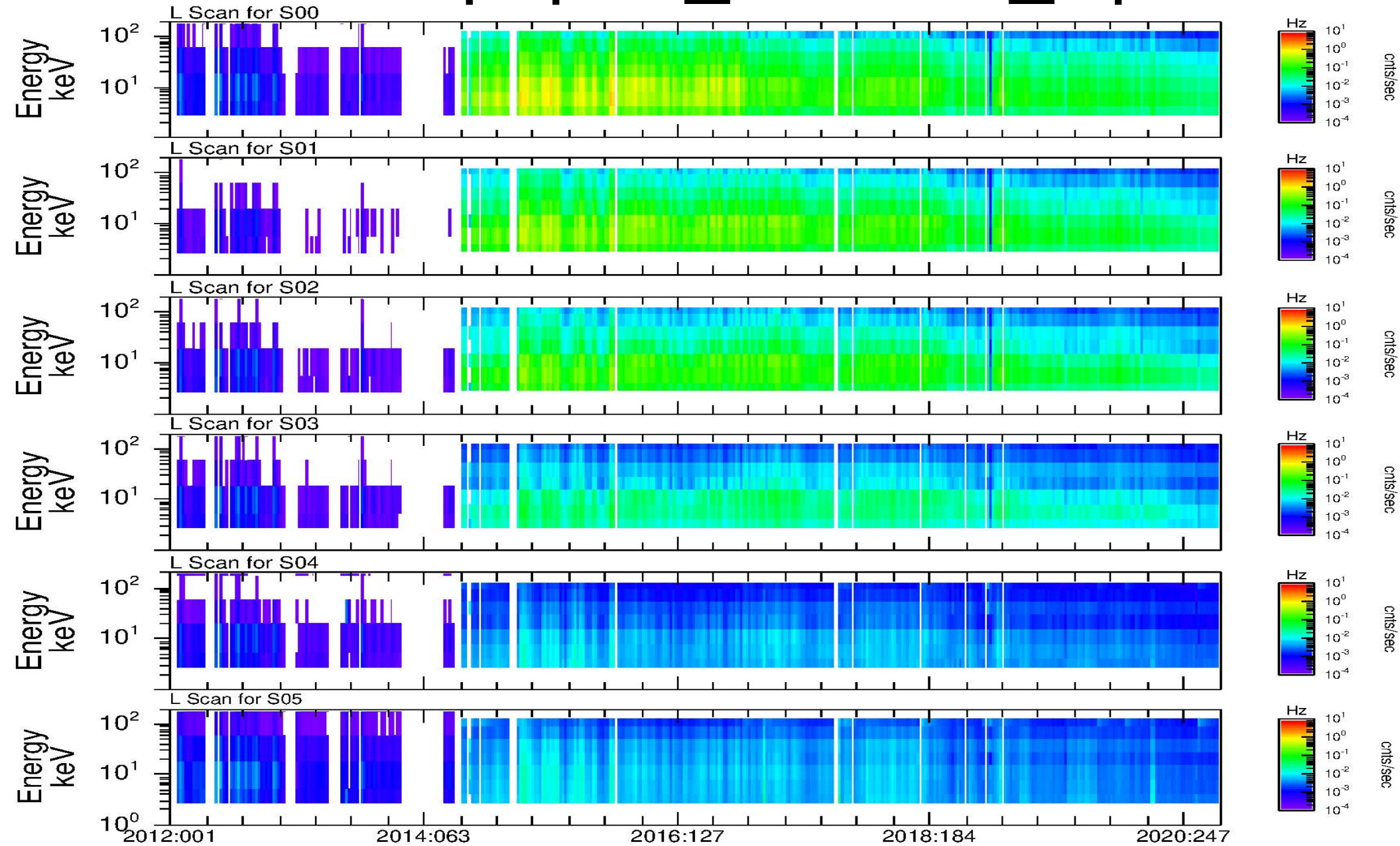


# nh-x-pepssi-4-plasma-v1.0/data

## total\_counts/pepssi\_reduced\_j\*

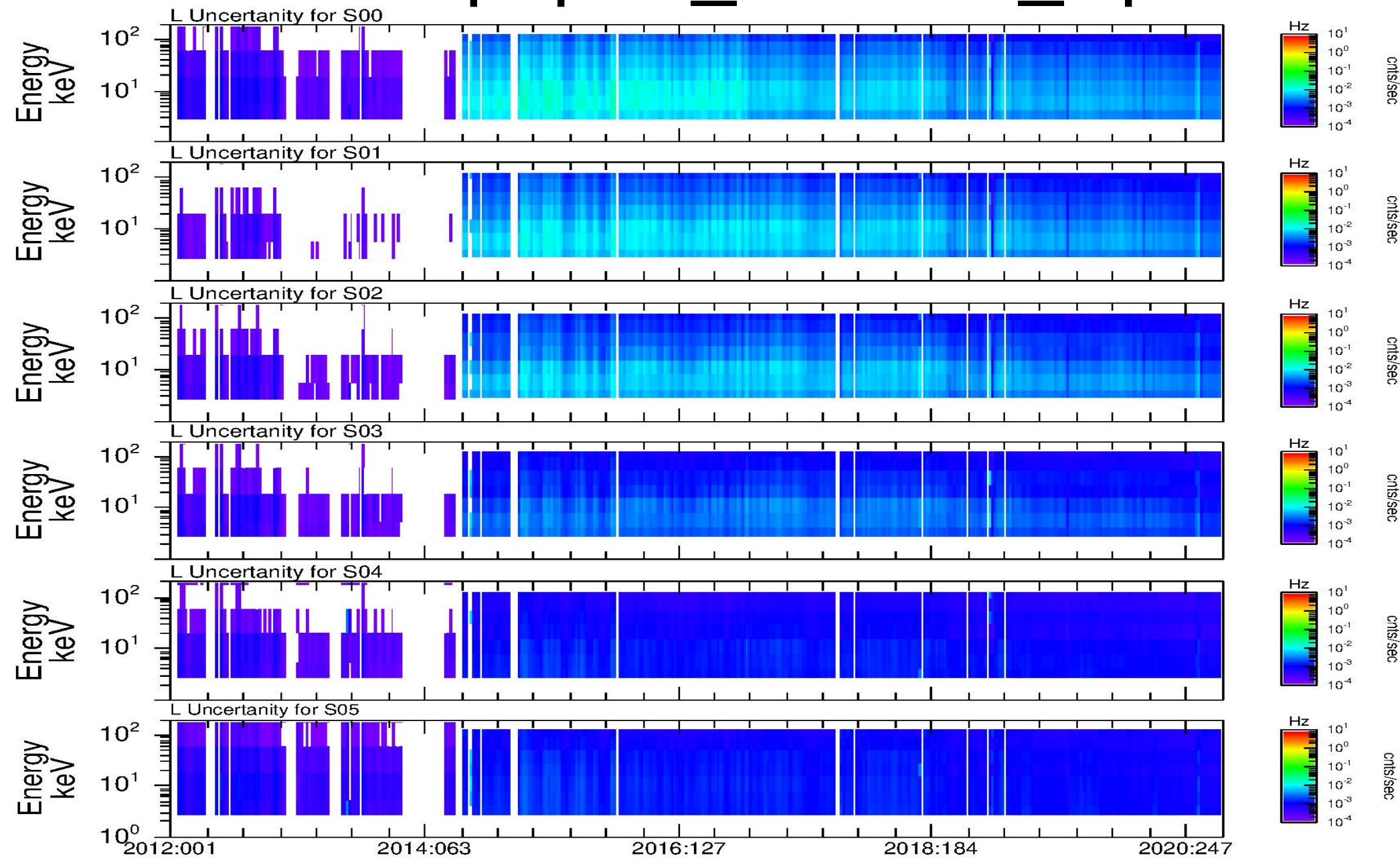


# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lcps\*

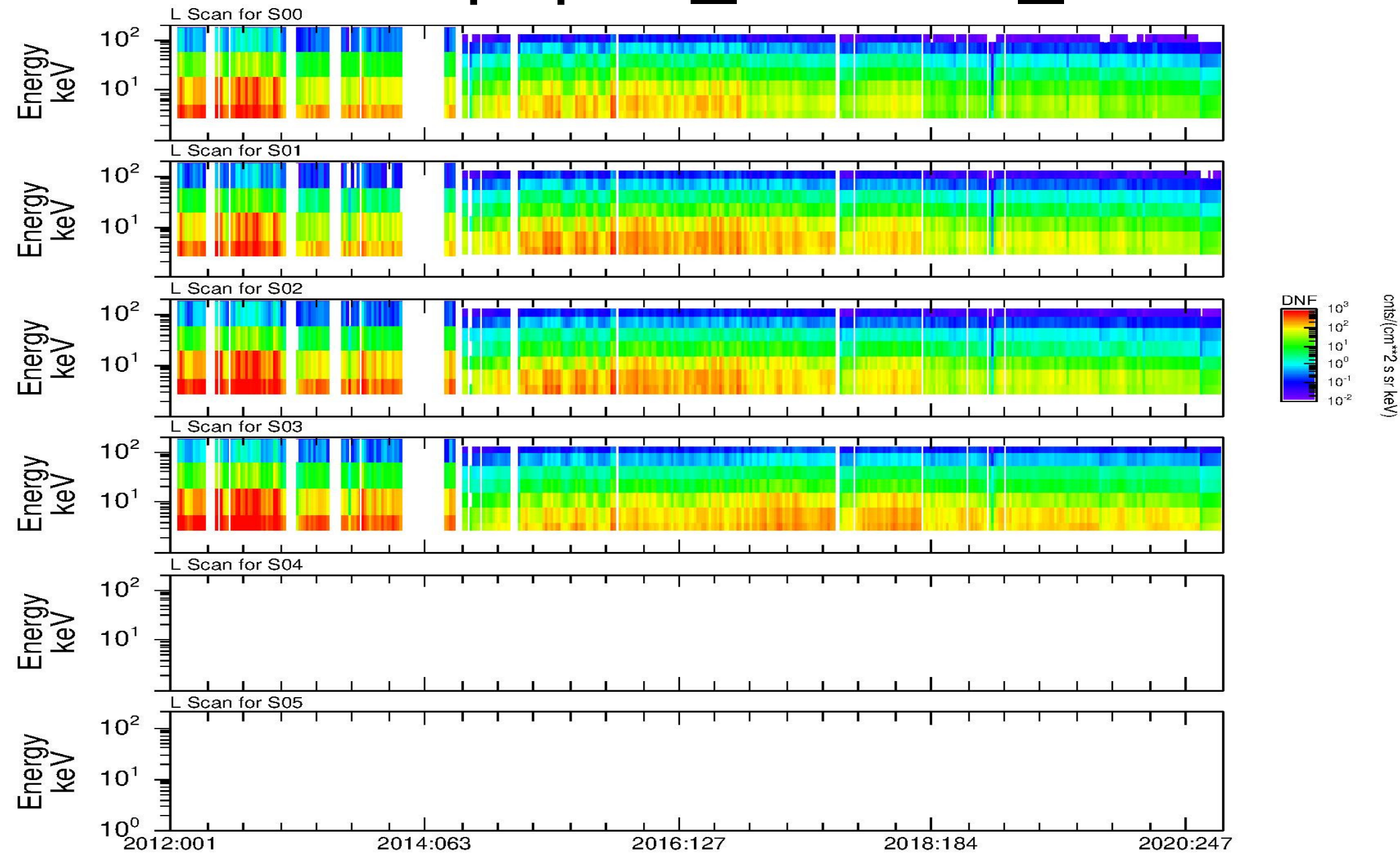




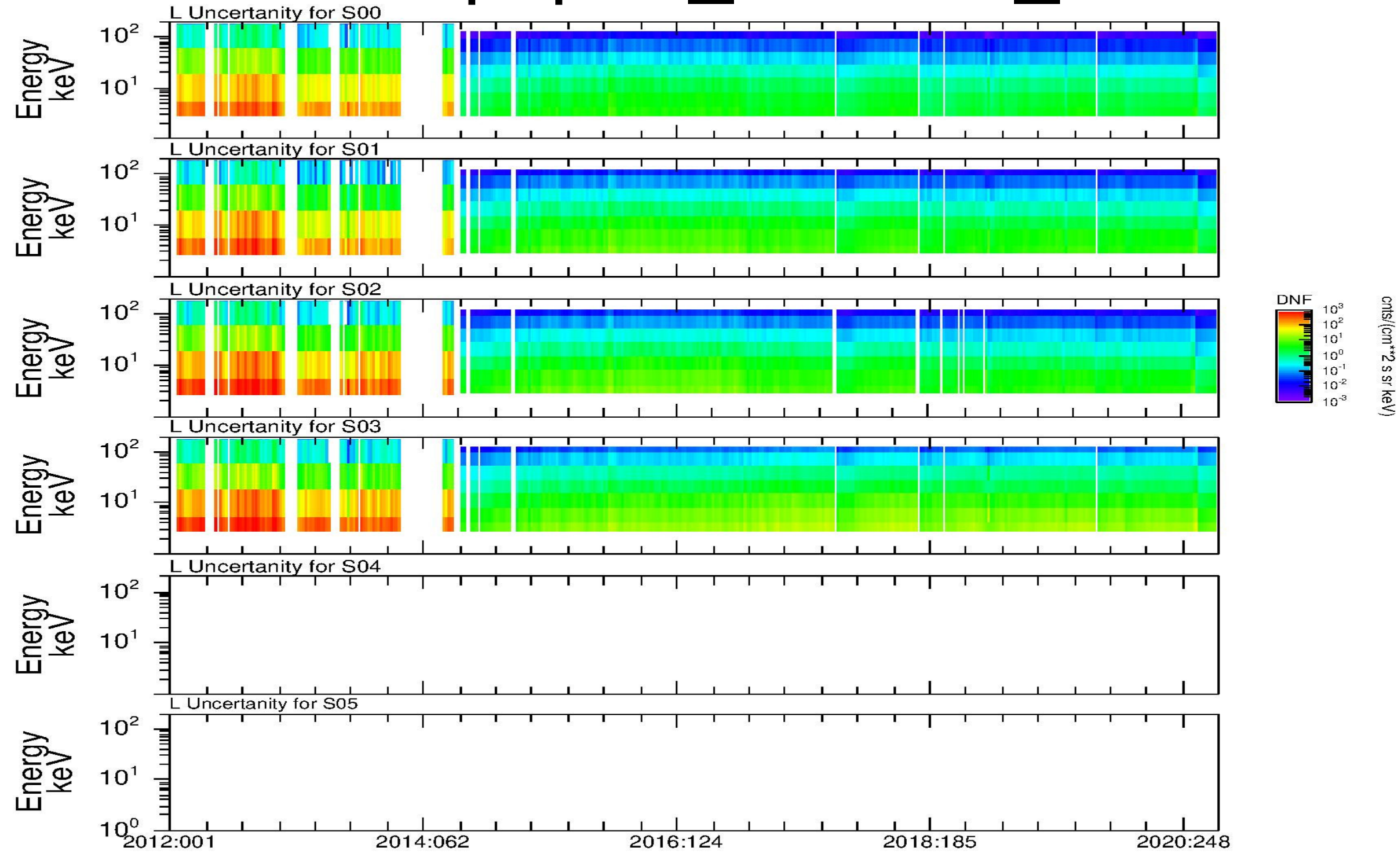
# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lcps\*



# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lflux\*

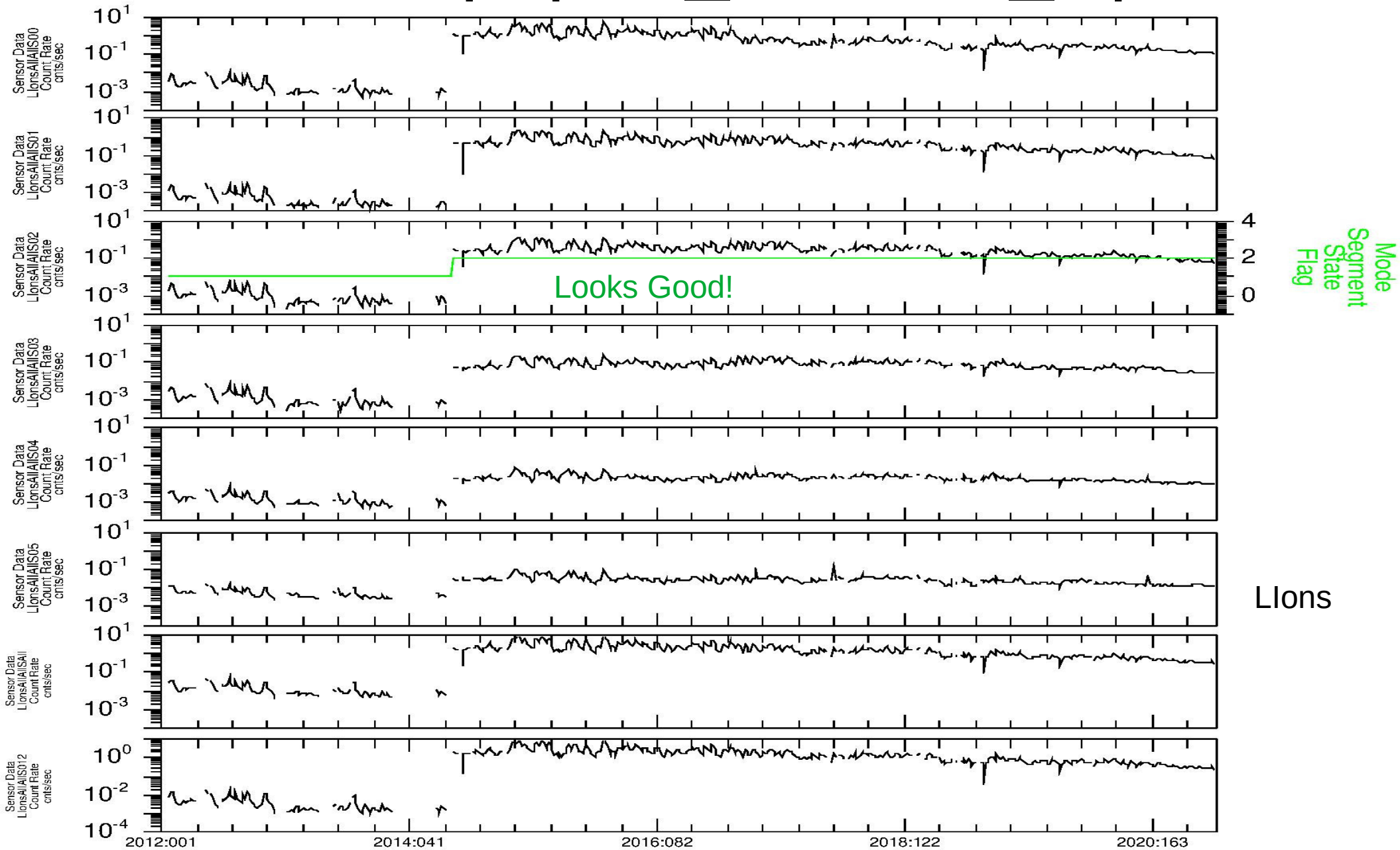


# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lflux\*

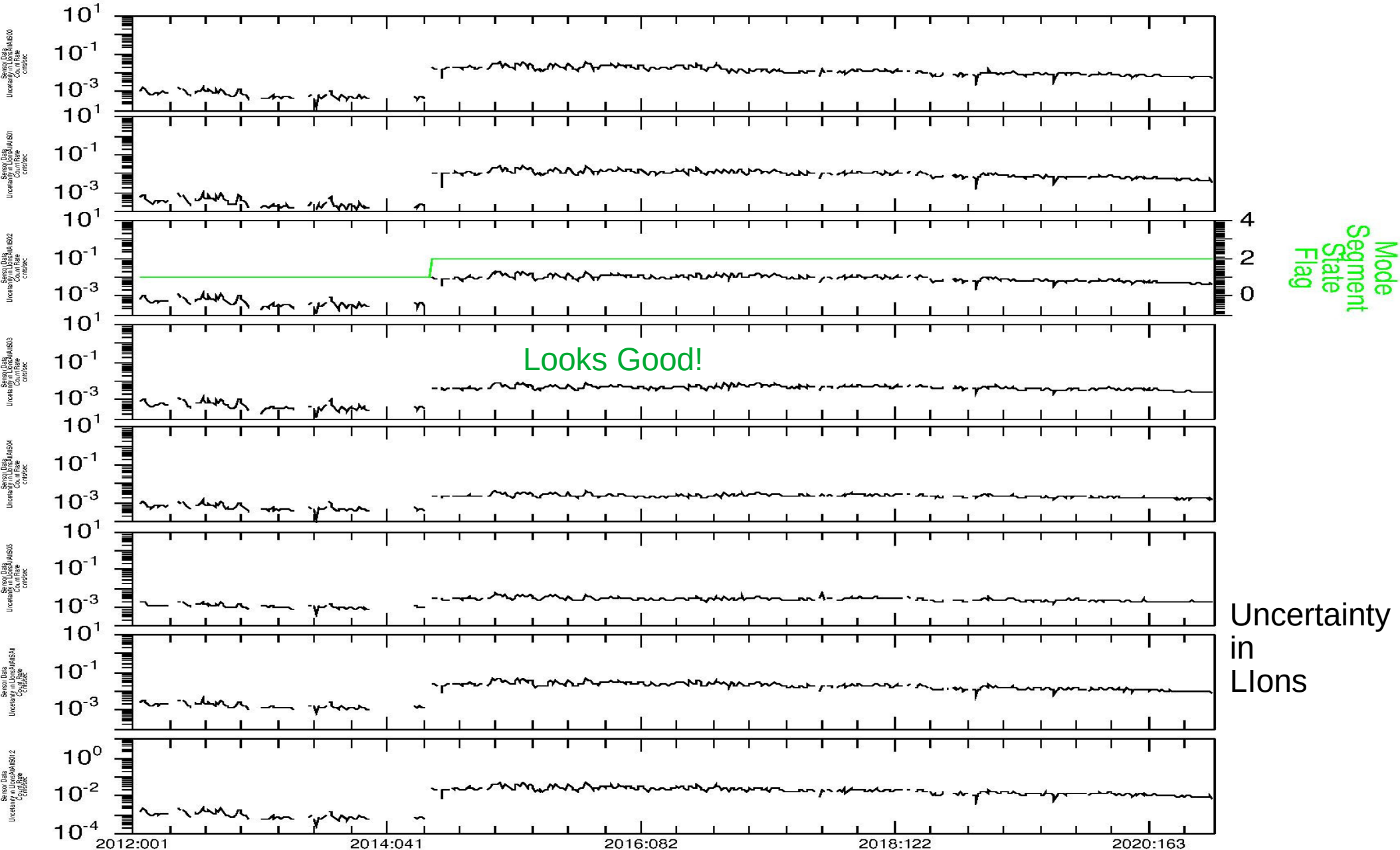




# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lcps\*

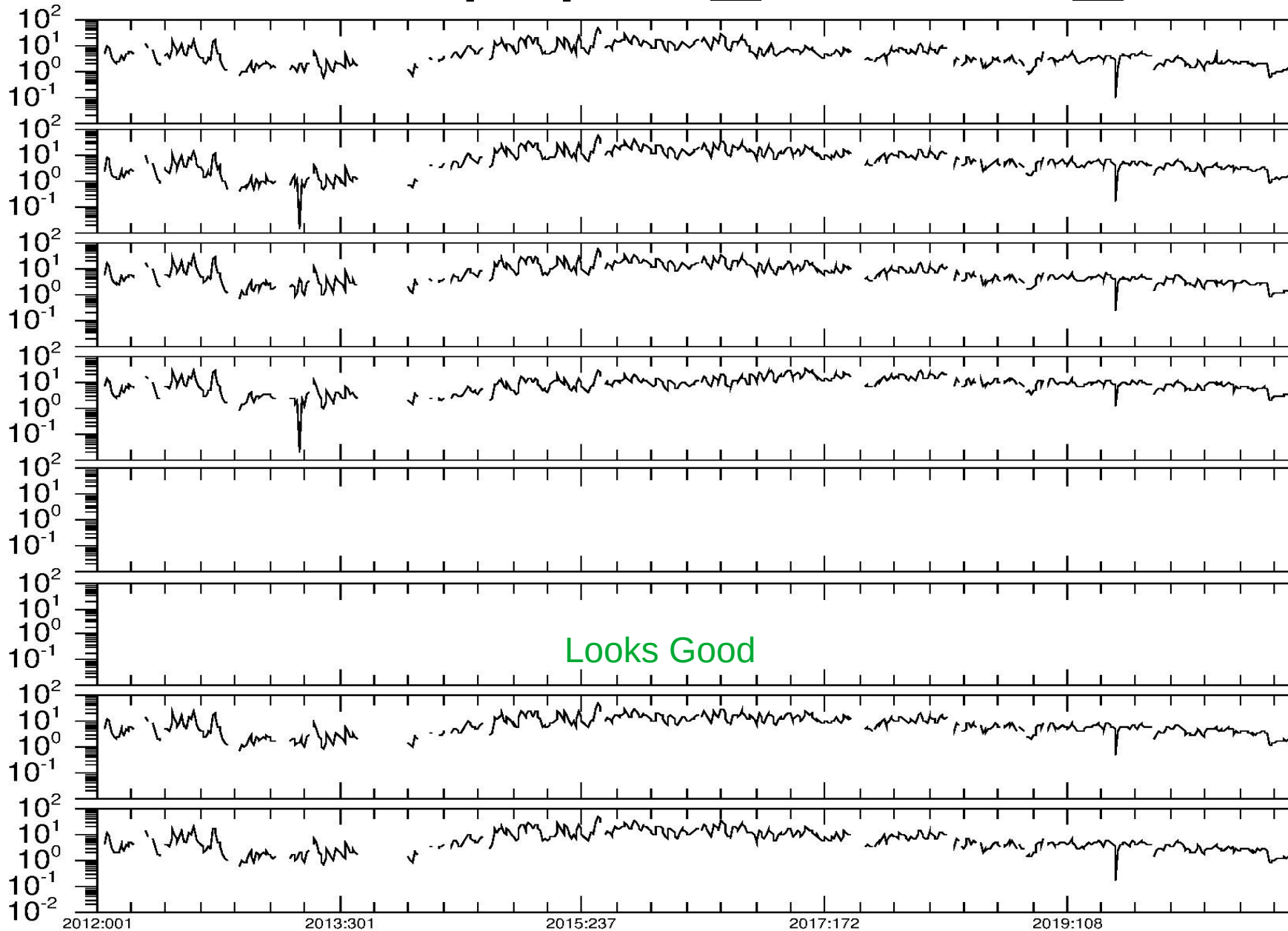


# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lcps\*



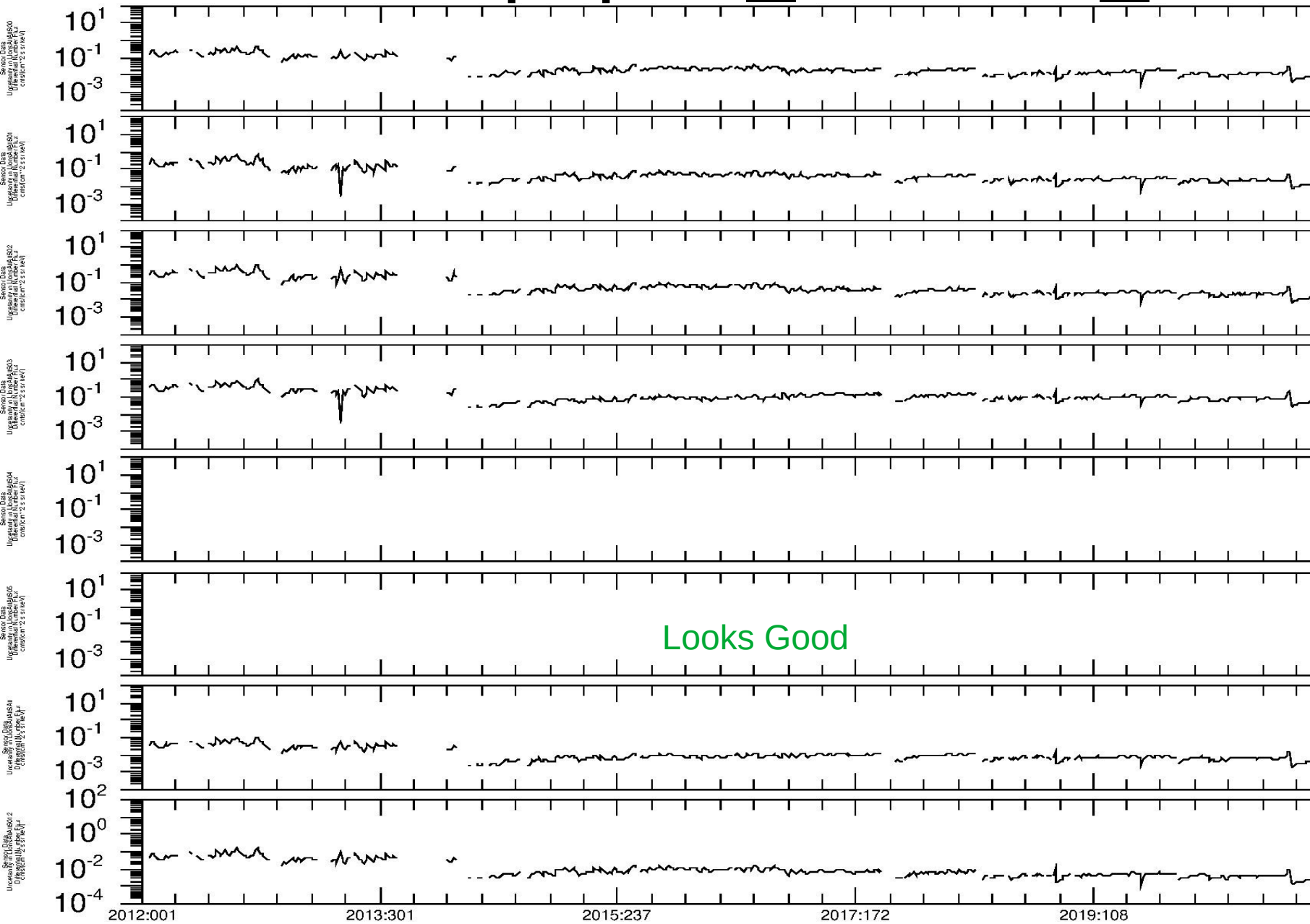


# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lflux\*



Lions

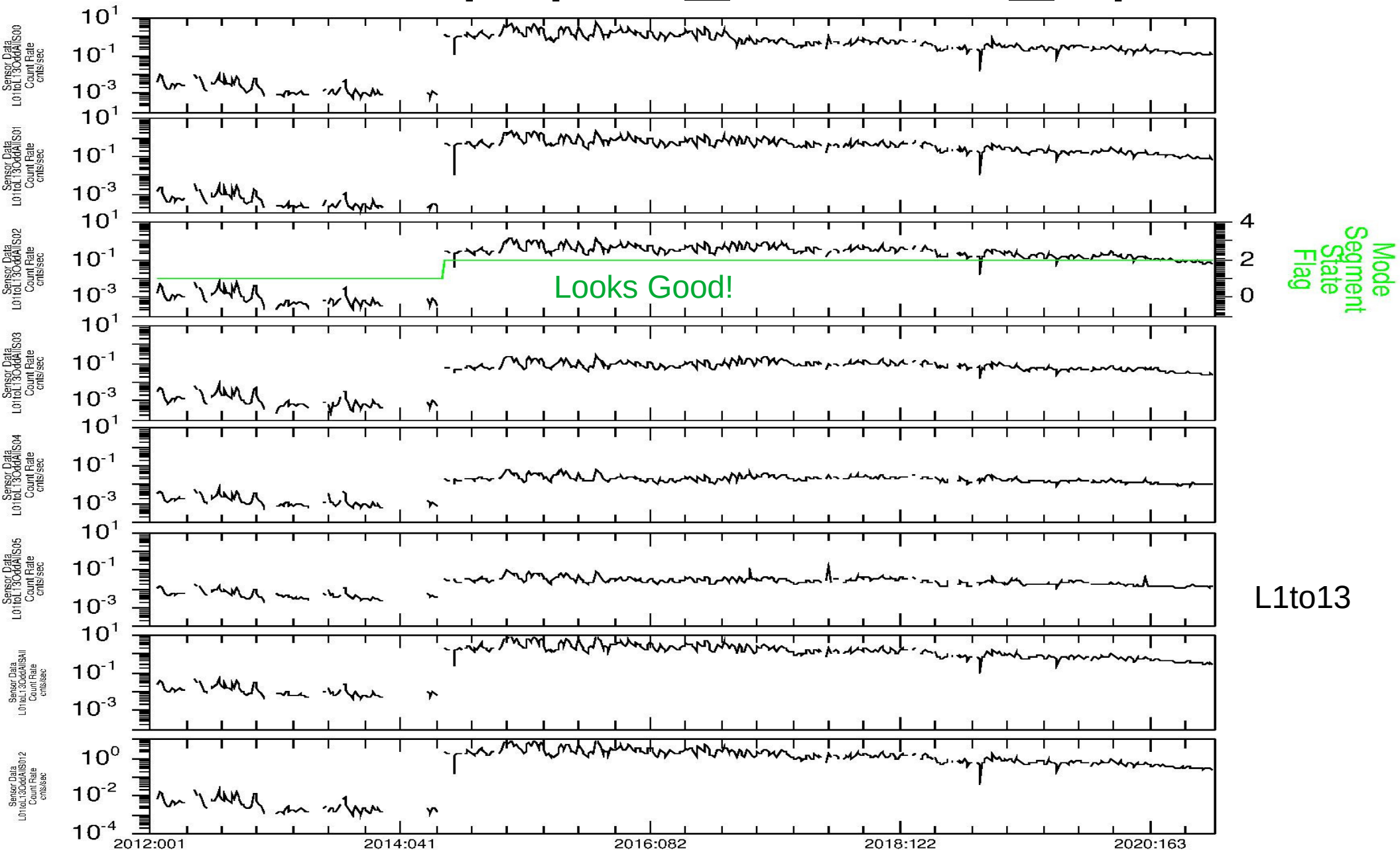
# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lflux\*



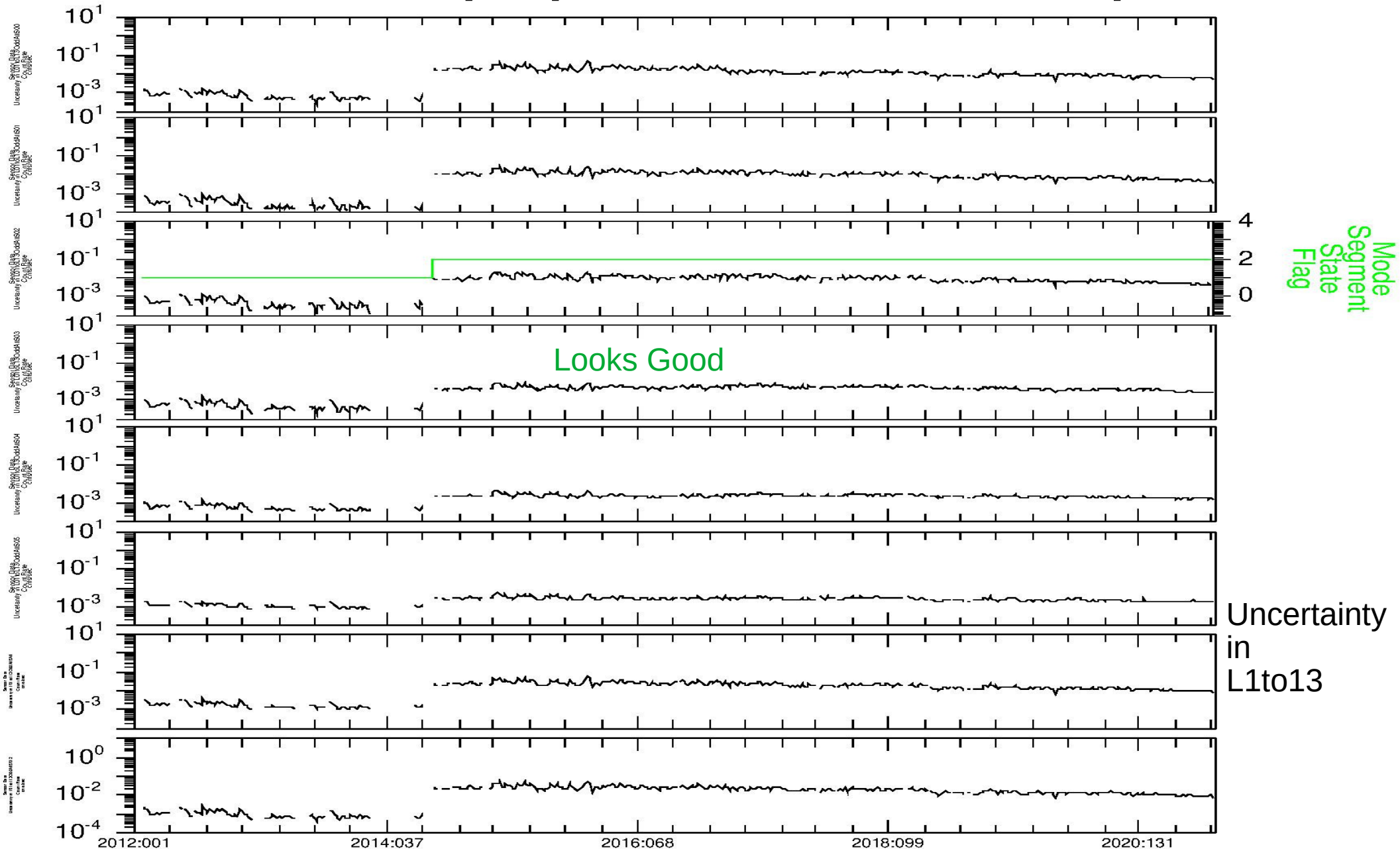
Looks Good

Uncertainty  
in  
Lions

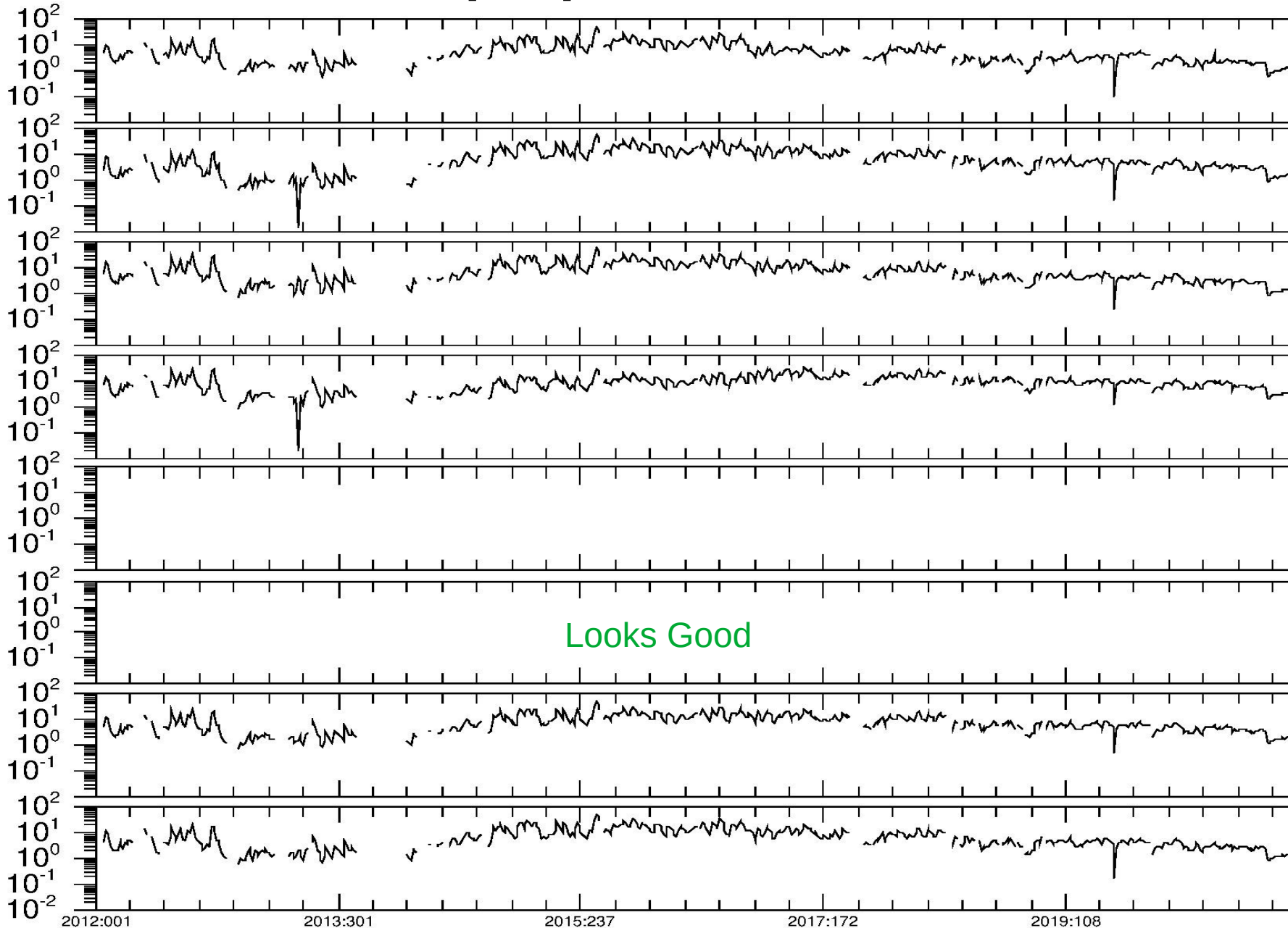
# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lcps\*



# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lcps\*



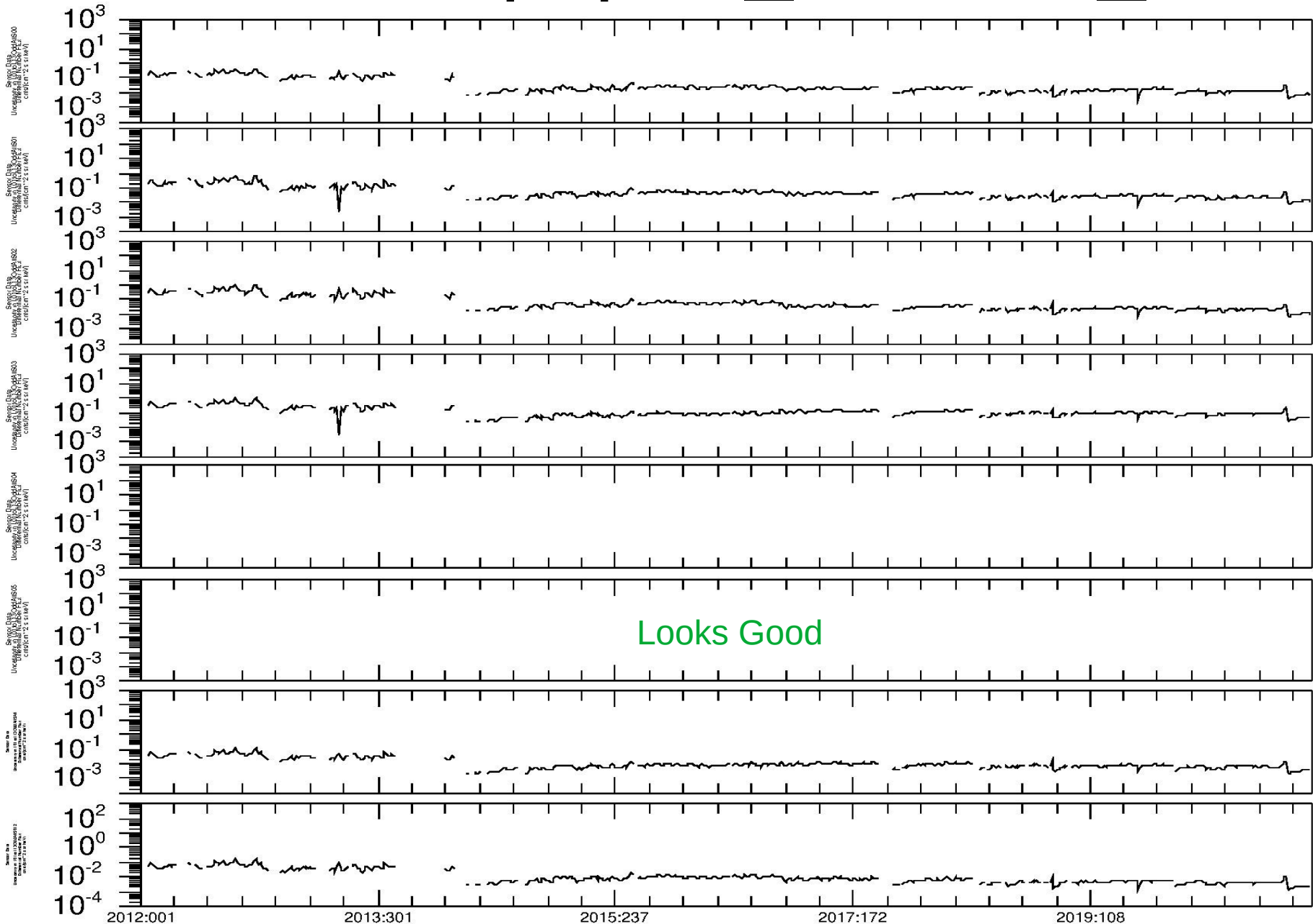
# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lflux\*



L1to13

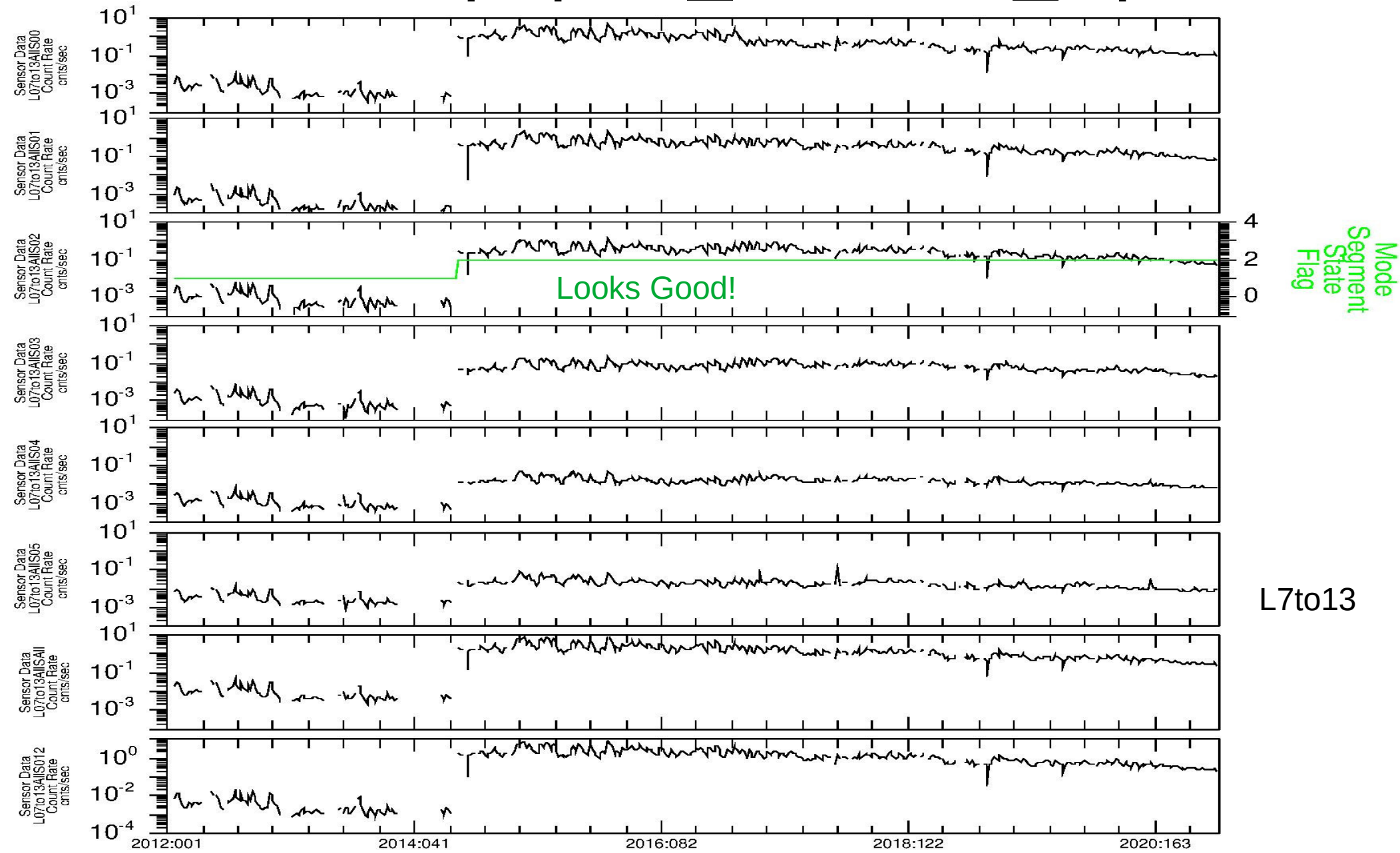


# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lflux\*

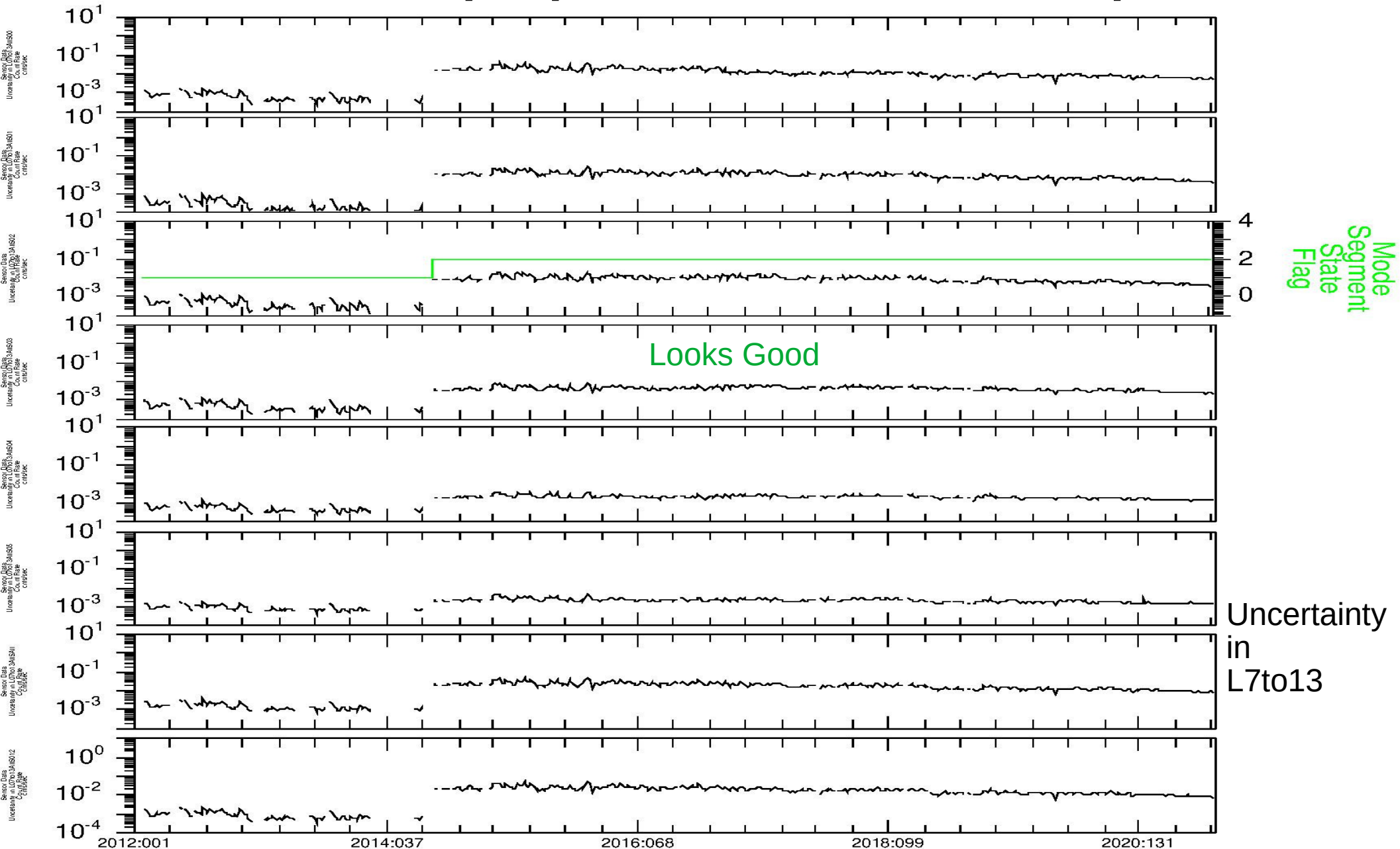


Uncertainty  
in  
Llons

# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lcps\*

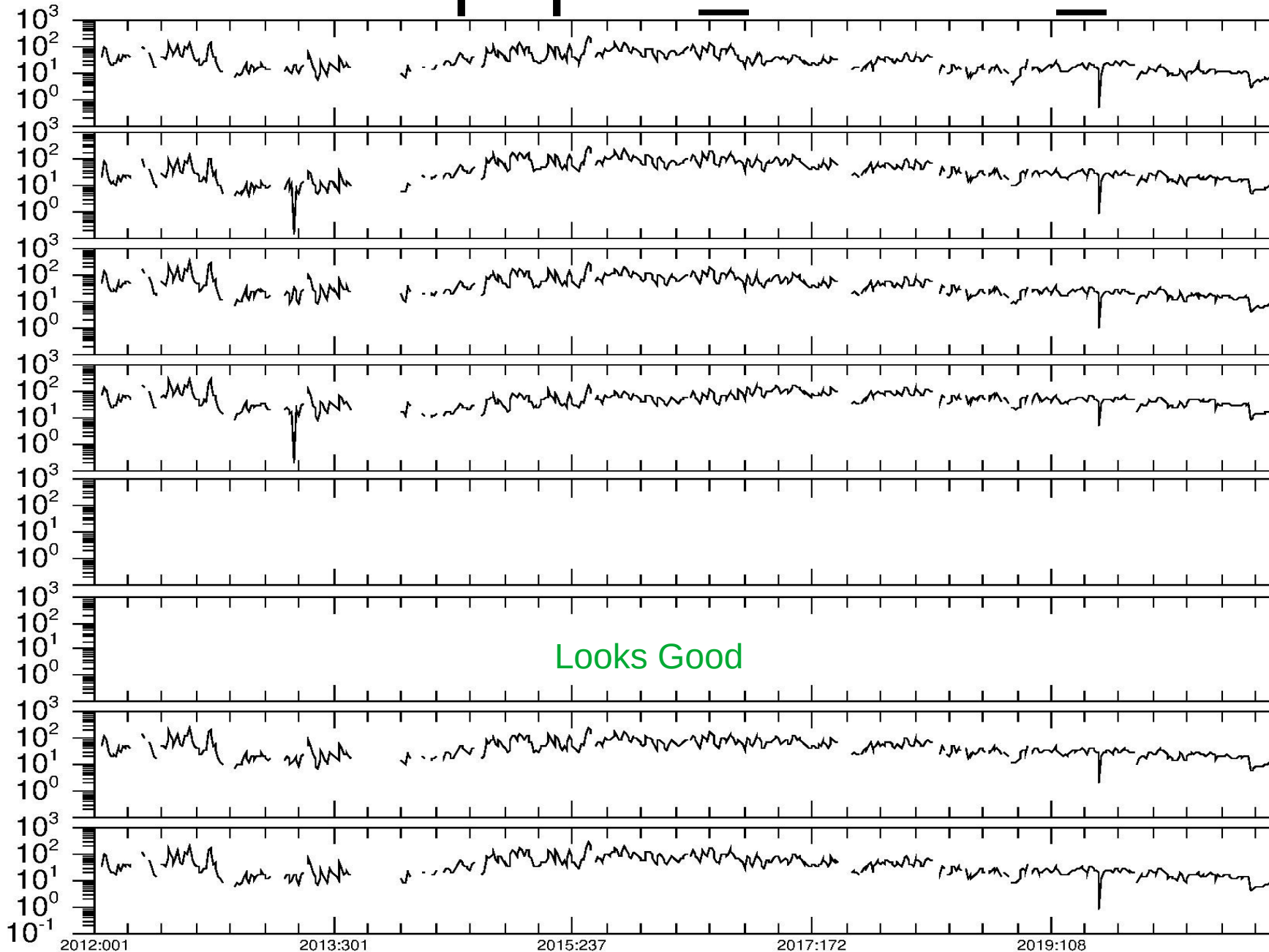


# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lcps\*



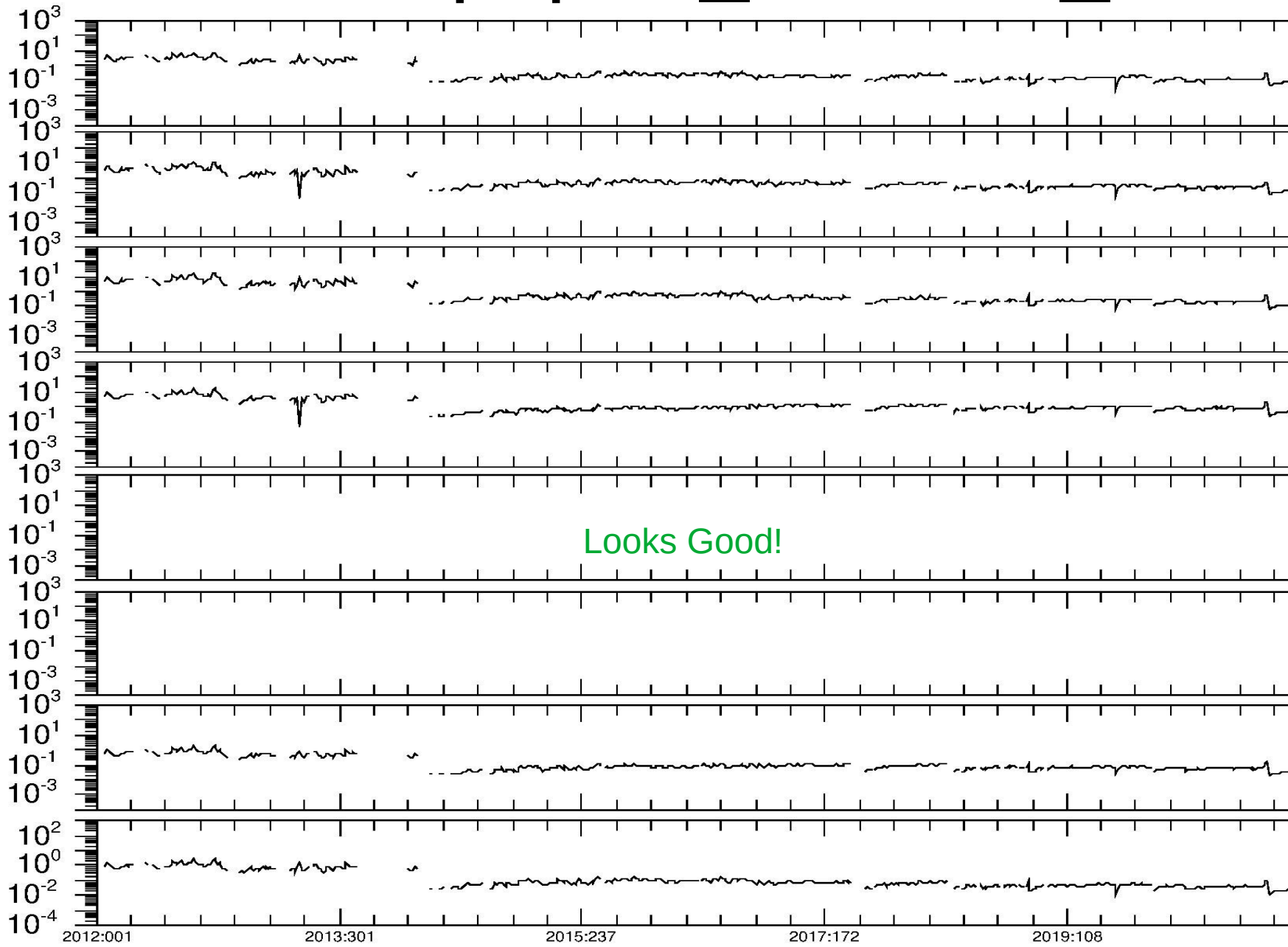


# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lflux\*



L7to13

# nh-x-pepssi-4-plasma-v1.0/data doubles/pepssi\_reduced\_lflux\*

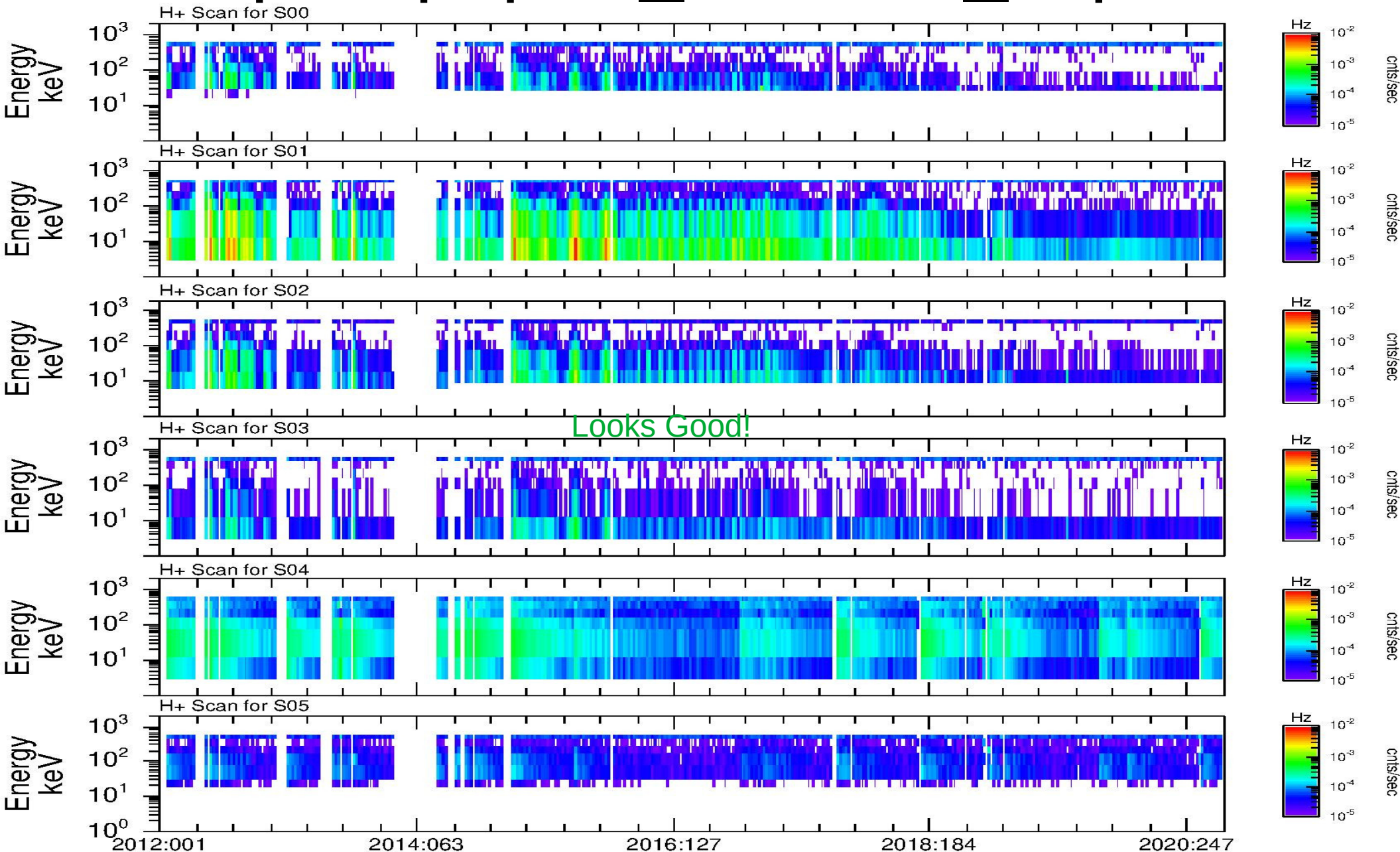


Looks Good!

Uncertainty  
in  
L7to13

# nh-x-pepssi-4-plasma-v1.0/data triples/pepssi\_reduced\_bcps\*

Protons

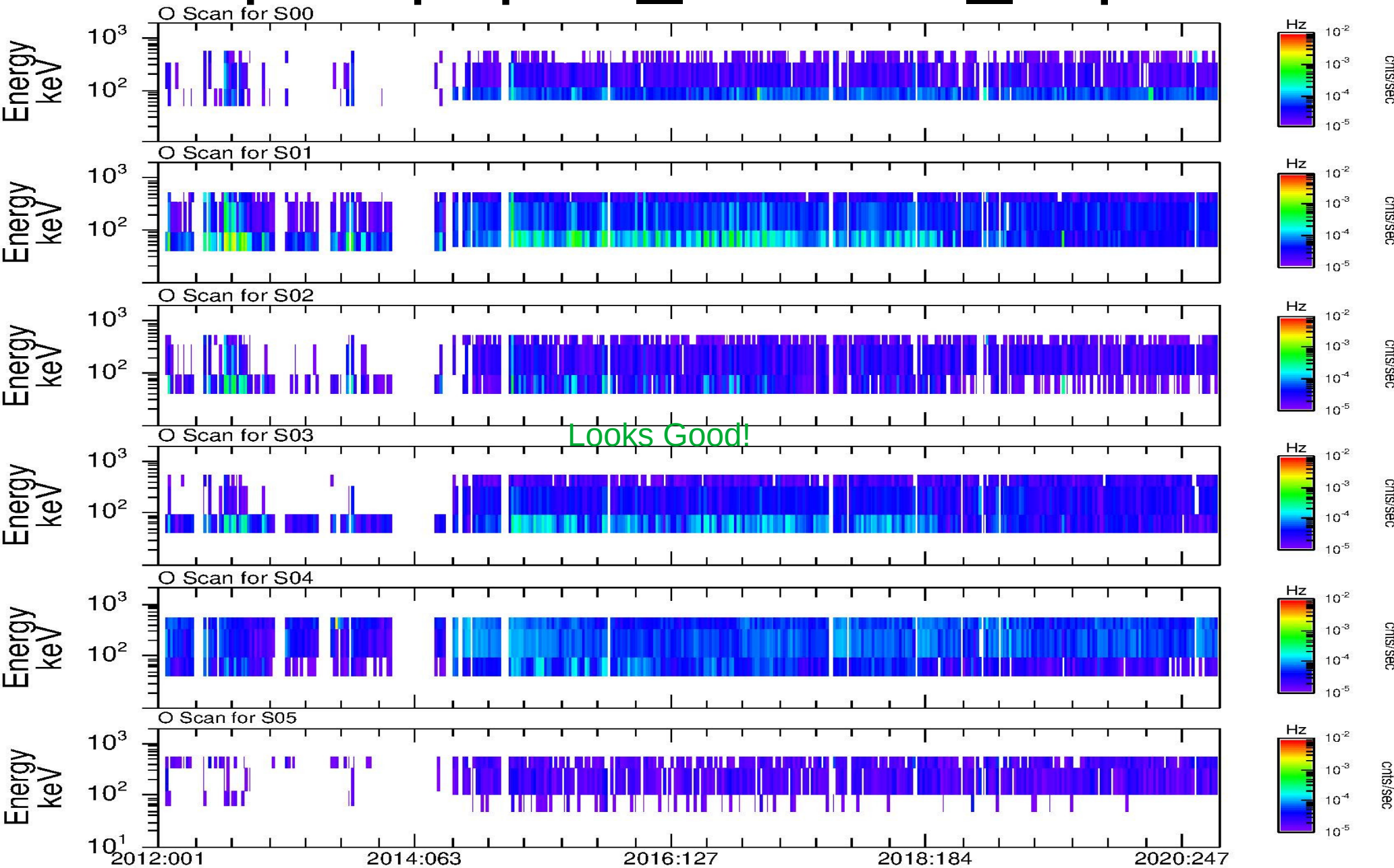






# nh-x-pepssi-4-plasma-v1.0/data triples/pepssi\_reduced\_bcps\*

Oxygen



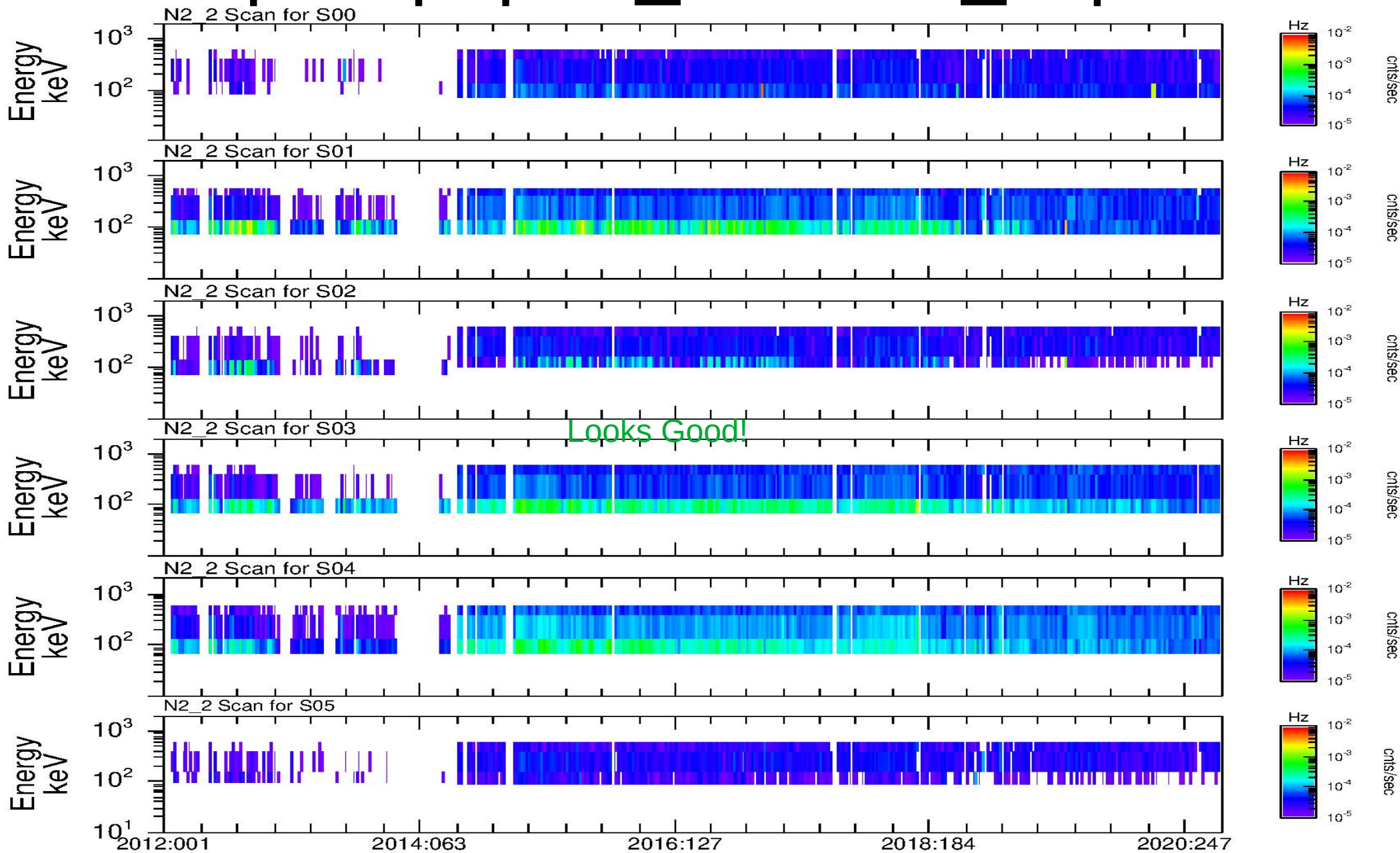


# nh-x-pepssi-4-plasma-v1.0/data

## triples/pepssi\_reduced\_bcps\*

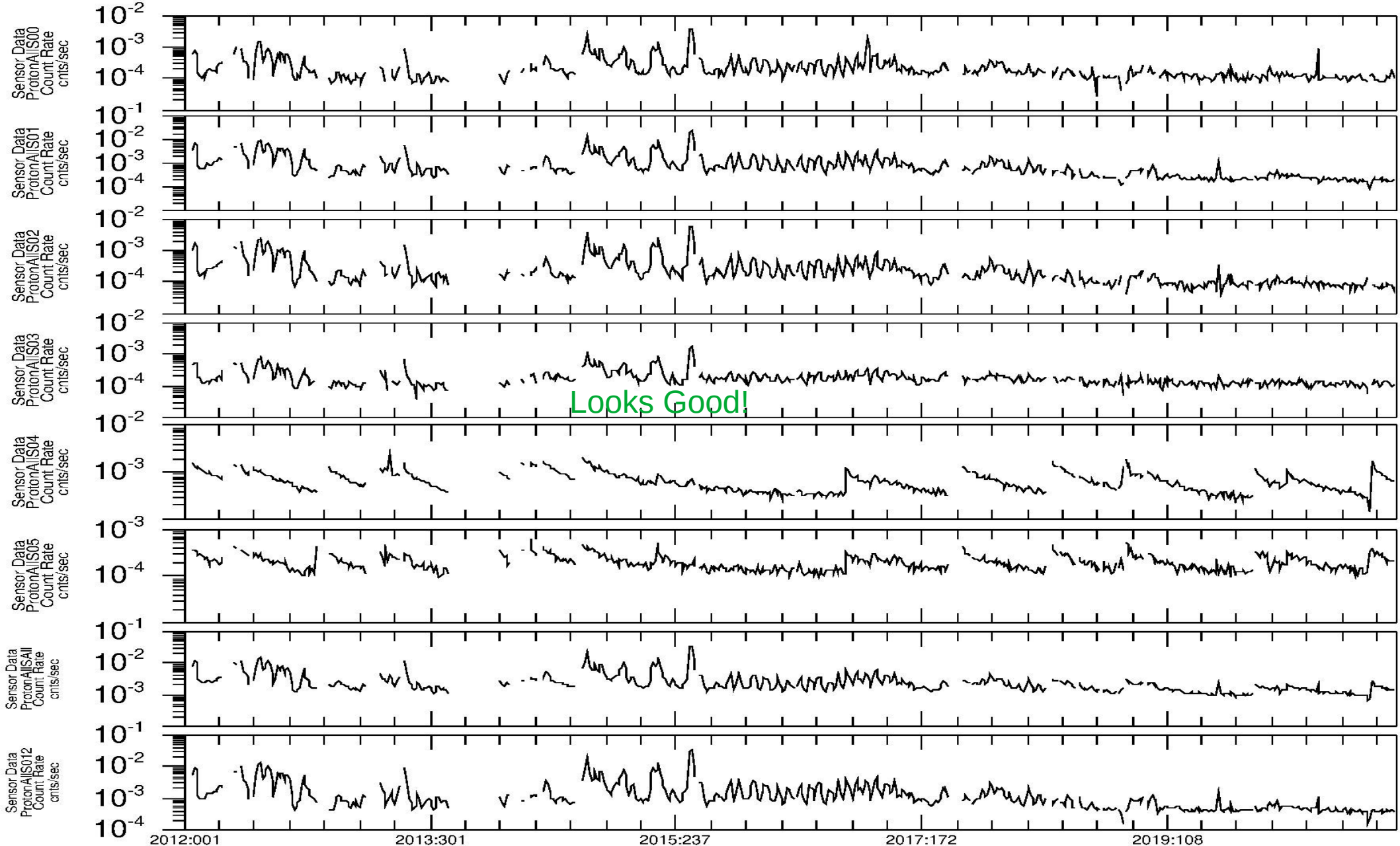
50

Nitrogen



# nh-x-pepssi-4-plasma-v1.0/data triples/pepssi\_reduced\_bcps\*

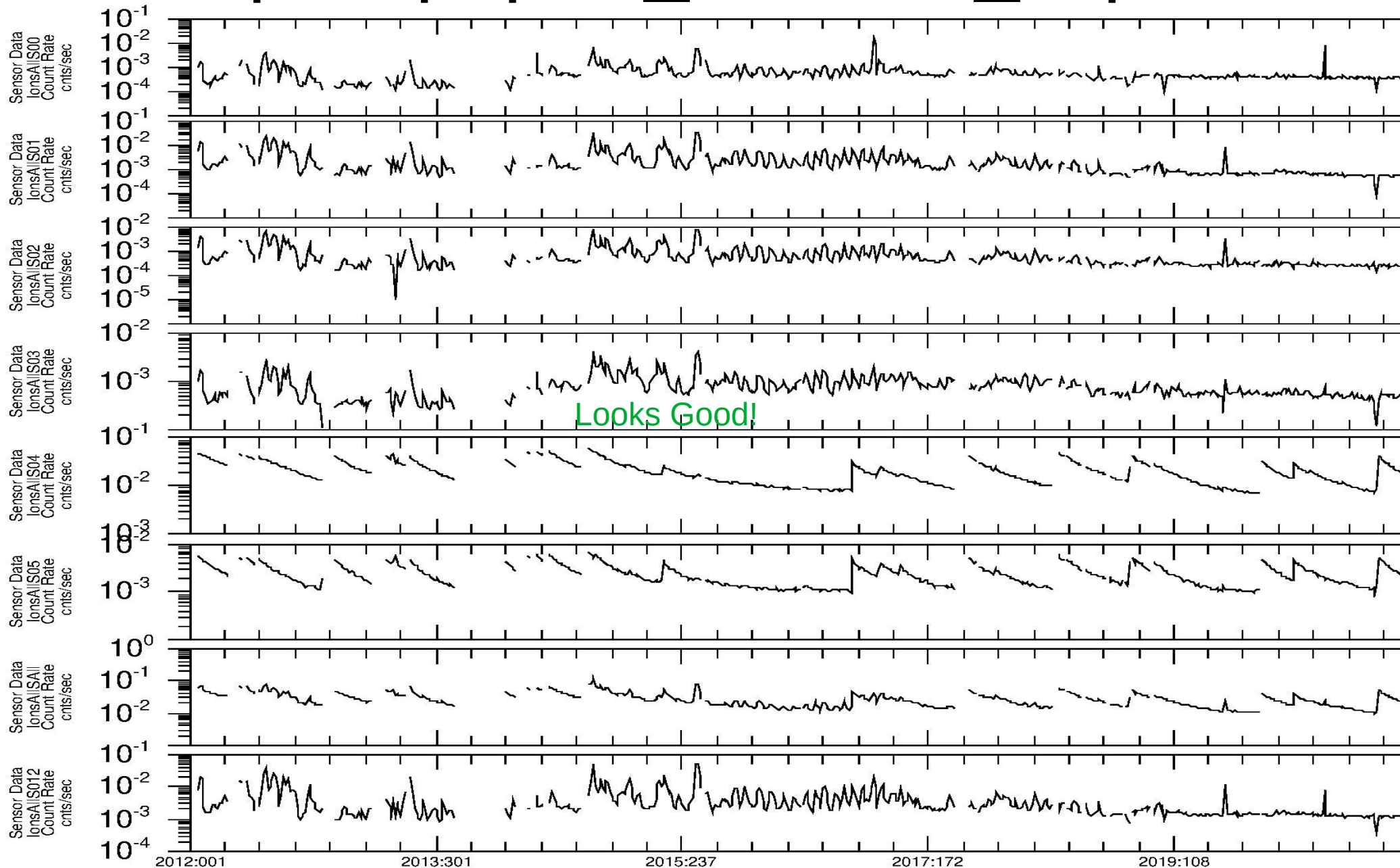
Protons



# nh-x-pepssi-4-plasma-v1.0/data

## triples/pepssi\_reduced\_bcps\*

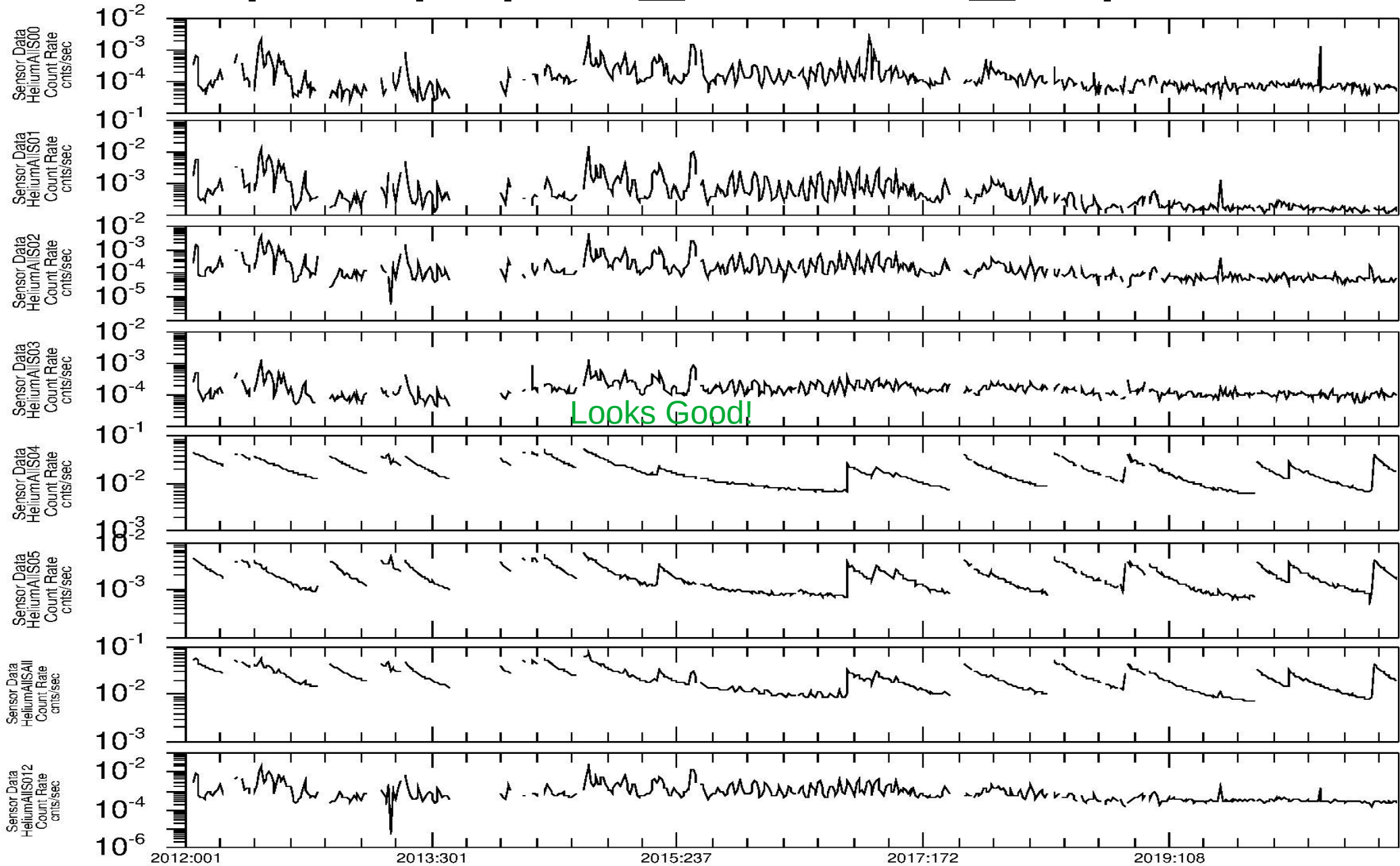
Ions





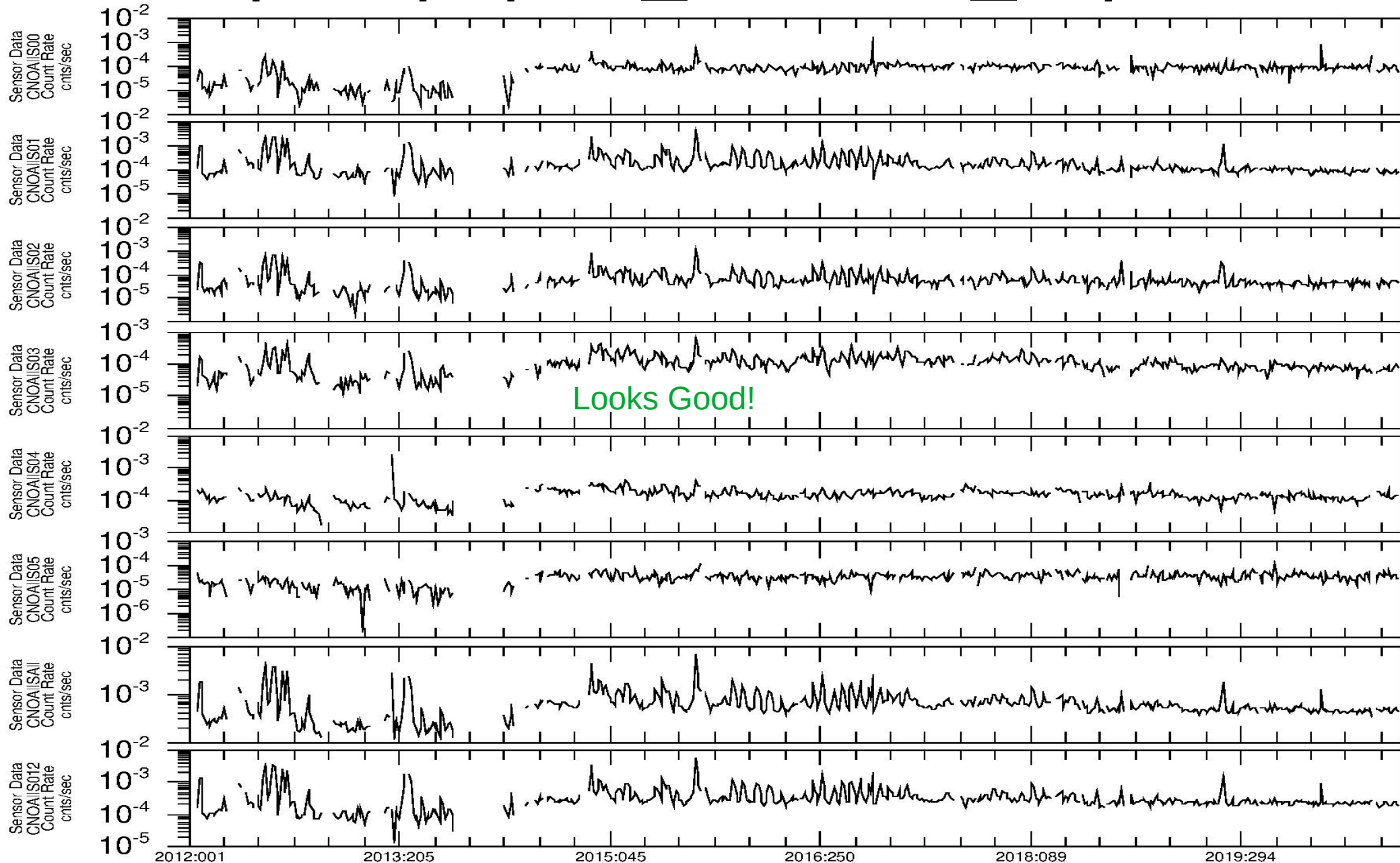
# nh-x-pepssi-4-plasma-v1.0/data triples/pepssi\_reduced\_bcps\*

Helium



# nh-x-pepssi-4-plasma-v1.0/data triples/pepssi\_reduced\_bcps\*

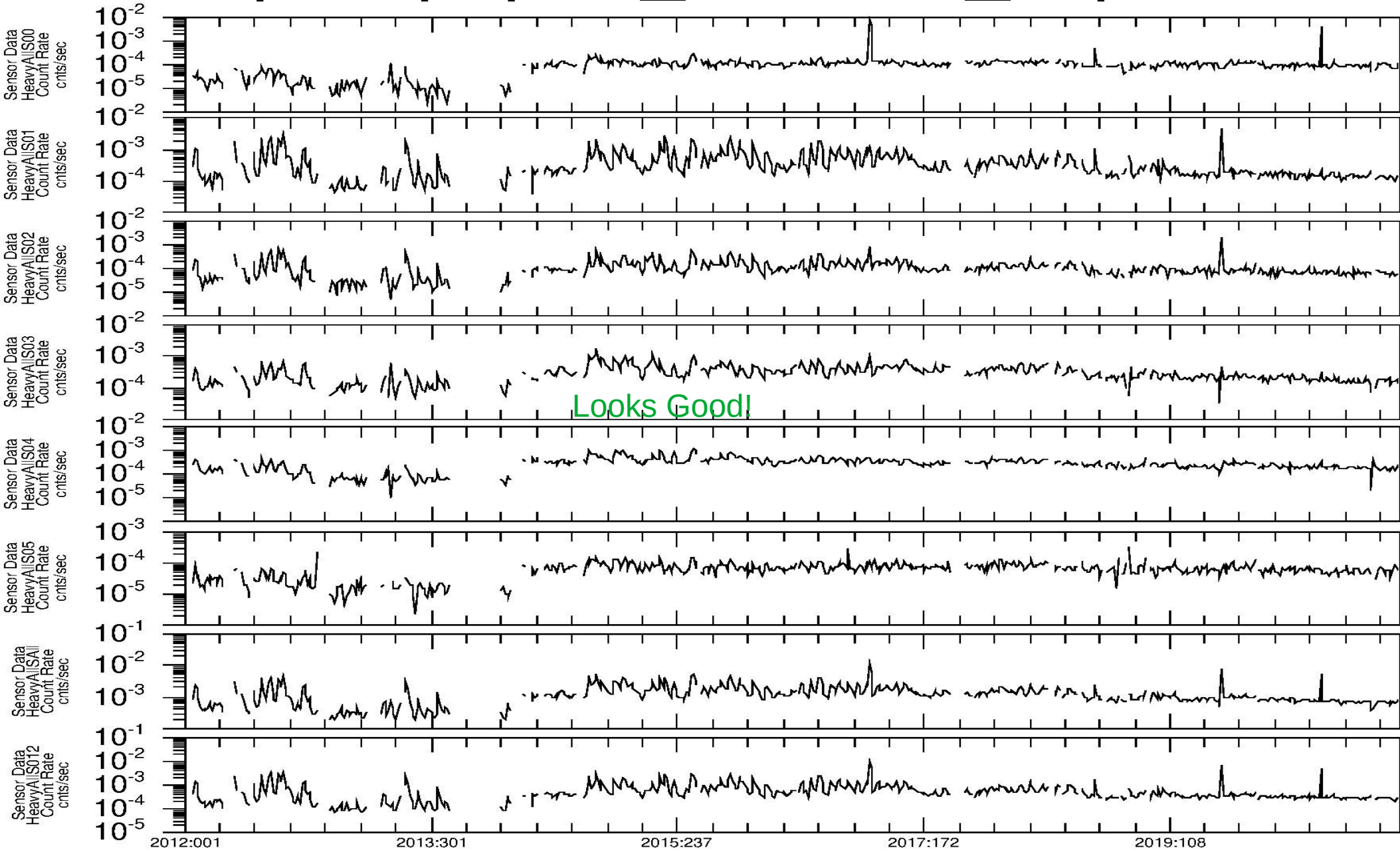
CNO

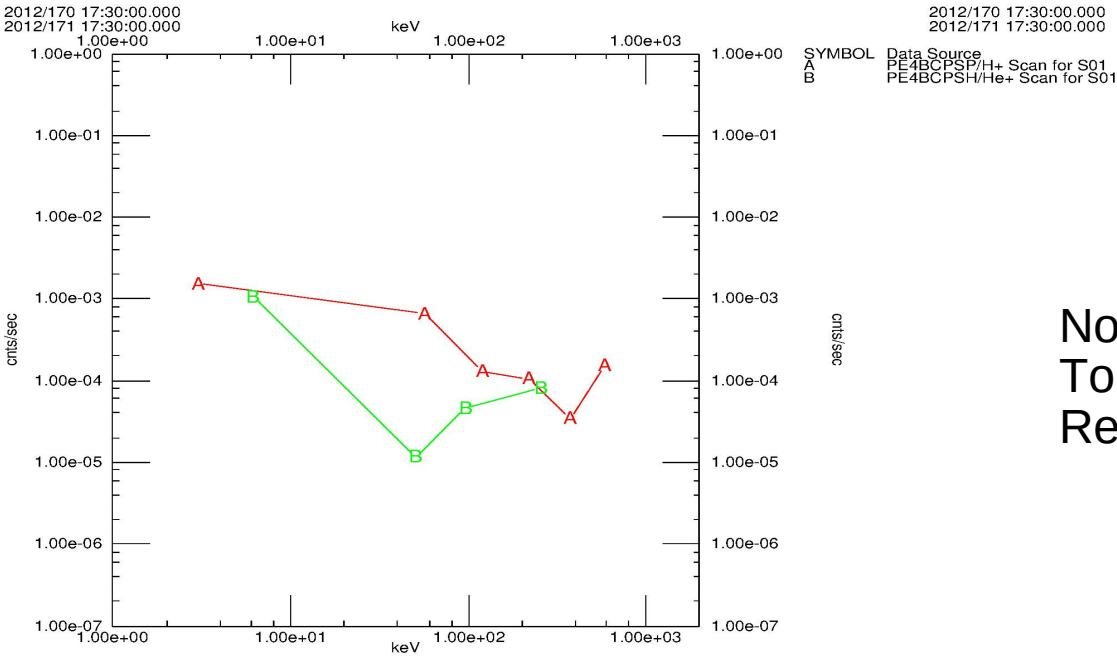


# nh-x-pepssi-4-plasma-v1.0/data

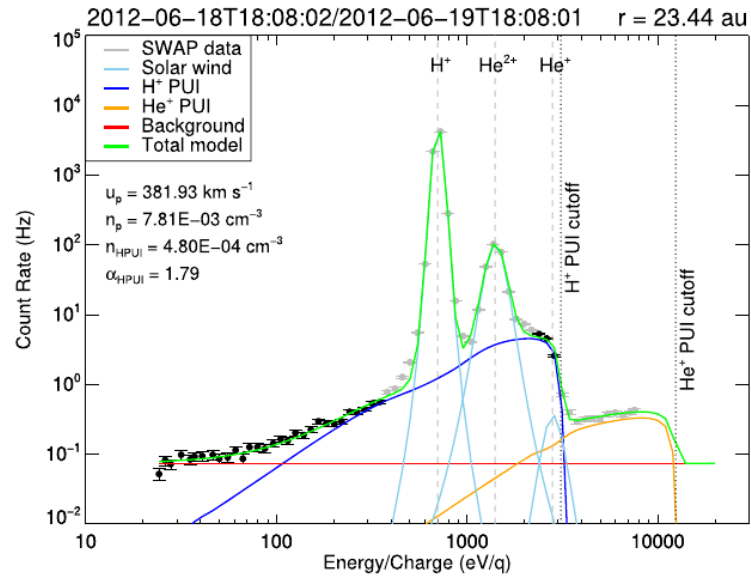
## triples/pepssi\_reduced\_bcps\*

Heavy





Not Enough Information  
To judge if the data are  
Reasonable.



Swaczyna et al., Astrophysical Journal, 2020.

# Certification Resampled

The document evaluation found that minor changes should be made as detailed on slides 8 and 10. The science data looked great. So my recommendation is to consider the changes detailed on slides 8 and 10 as editorial, make the changes and then certify the data set.

# BACK-UP Slides



# PEPSSI Electrons - 3

Why are the fluxes from PEPSSI abnormally high?

