

# Solar Wind Around Pluto

## SWAP

PRINCIPAL INVESTIGATOR  
Dave McComas, Princeton University

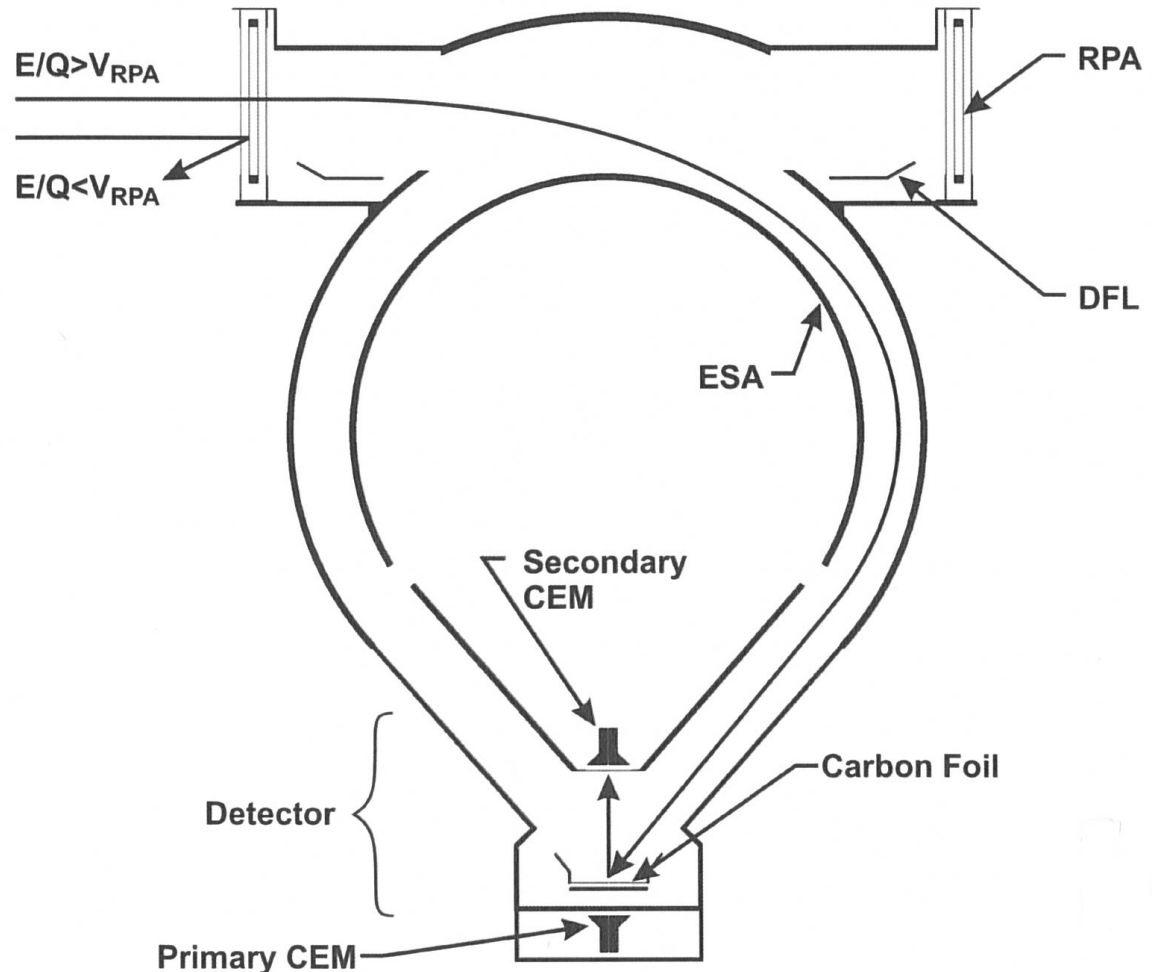
DESCRIPTION  
Low Energy Plasma Instrument

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



# New Horizons SWAP Data Sets

RAW Data Sets:

nh-a-swap-2-kem1-v5.0

CALIBRATED Data Sets:

nh-a-swap-3-kem1-v5.0

DERIVED Data Sets:

nh-x-swap-5-derived-solarwind-v2.0

RAW and CALIBRATED Data Sets Handled  
Separately from DERIVED Data Sets

# New Horizons SWAP Data Set Evaluation Tools

Staging and Evaluation -

Machine: Dell Precision Tower 5810

Operating System: Fedora 33 linux

Data Processing -

Machine: Sun Ultra-350

Operating System: Sun Solaris OS 5.9

Minor Diagnostics -

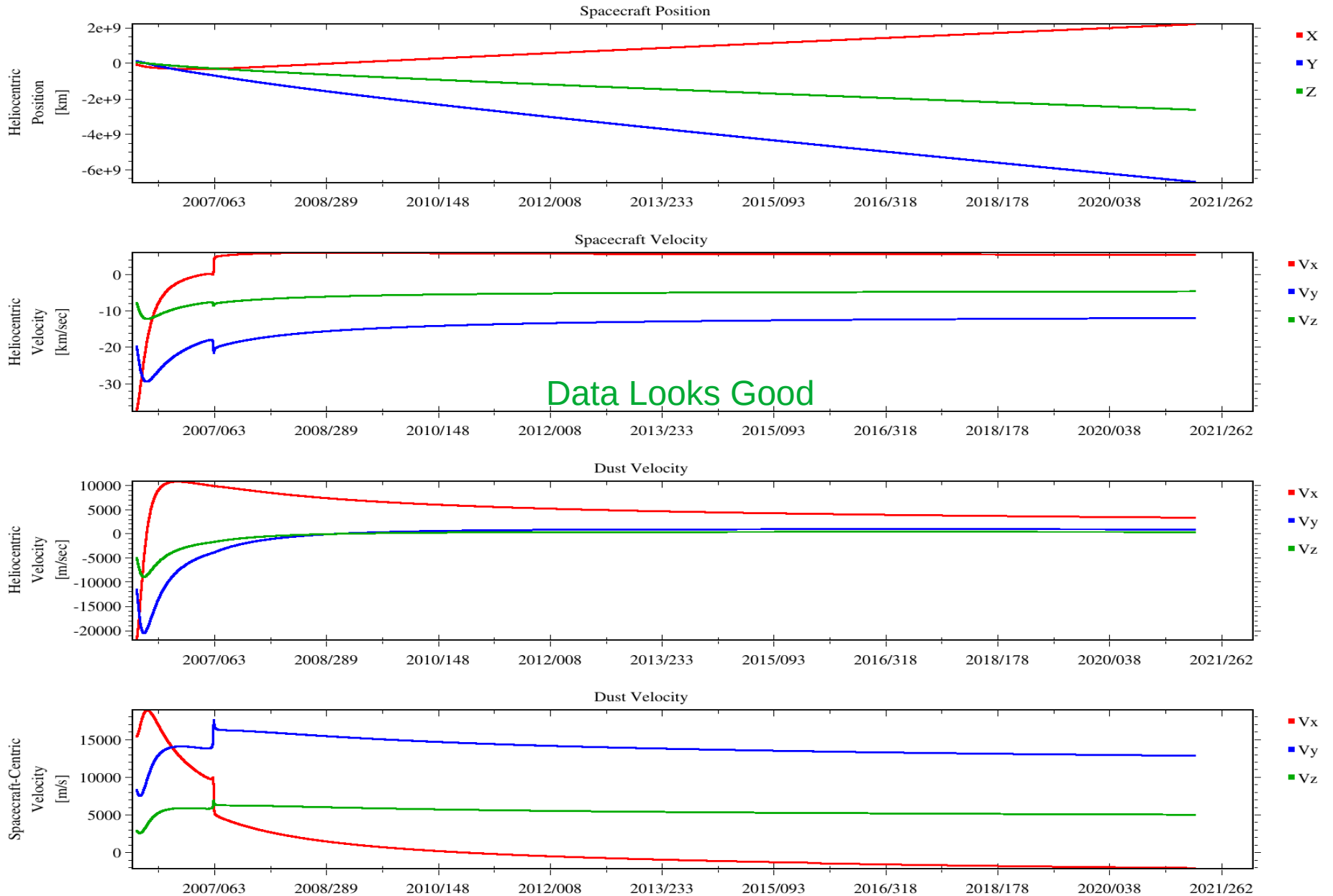
Machine: Dell 7520

Operating System: Fedora 33 linux

# **SWAP RAW and CALIBRATED Documentation Evaluation**



# nh-a-swap-2-kem1-v5.0/document nh-a-swap-3-kem1-v5.0/document nh\_mission\_trajectory.tab



Please indicate which curve is which response.

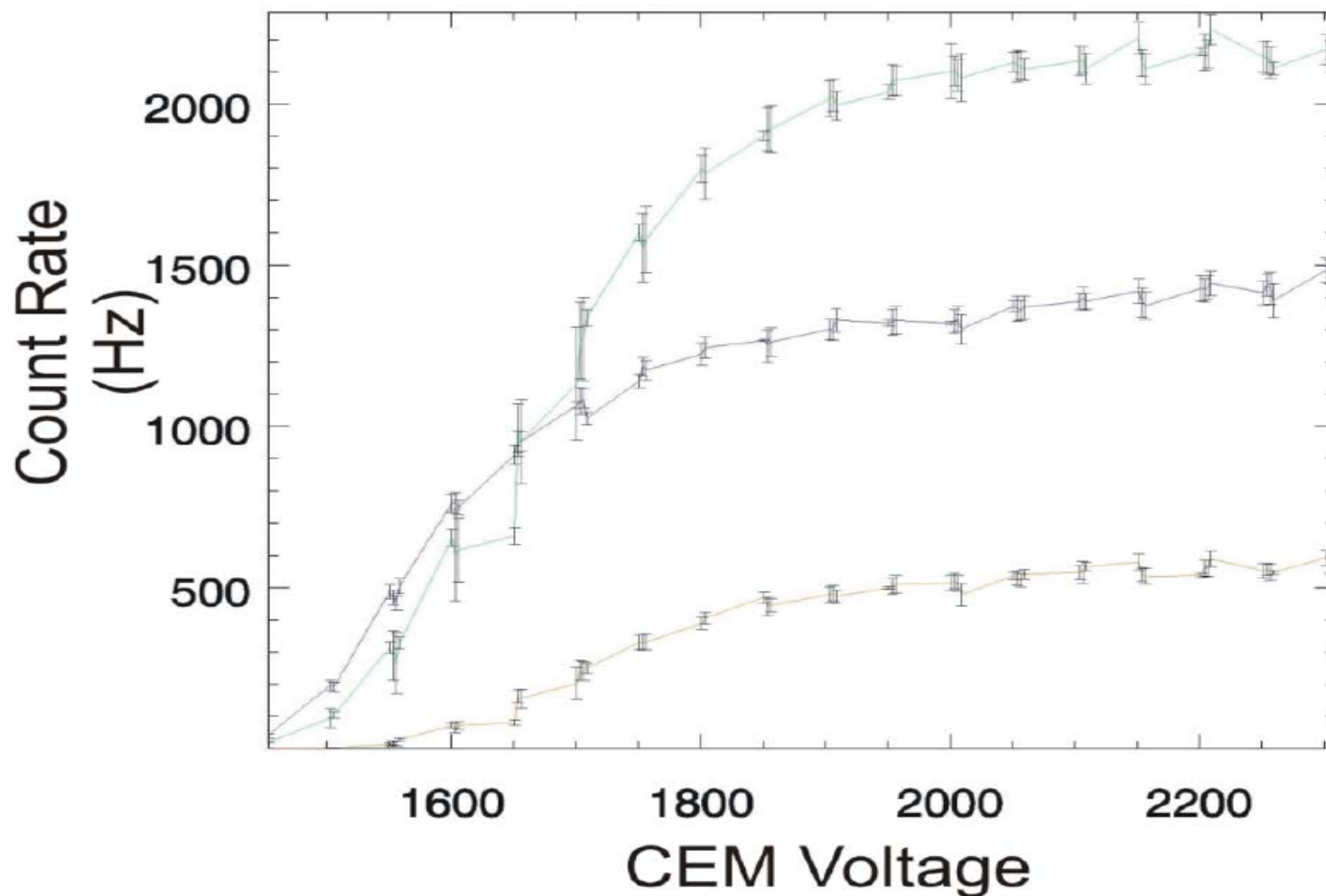


Figure 7. PCEM, SCEM, and coincidence rate response as a function of voltage.

$$R_c = \frac{C}{t} \quad \text{(Equation 1)}$$

$$(\Delta R_c)^2 = \left( \frac{\partial R_c}{\partial t} \right)^2 (\Delta t)^2 + \left( \frac{\partial R_c}{\partial C} \right)^2 (\Delta C)^2 \quad \text{(Equation 2)}$$

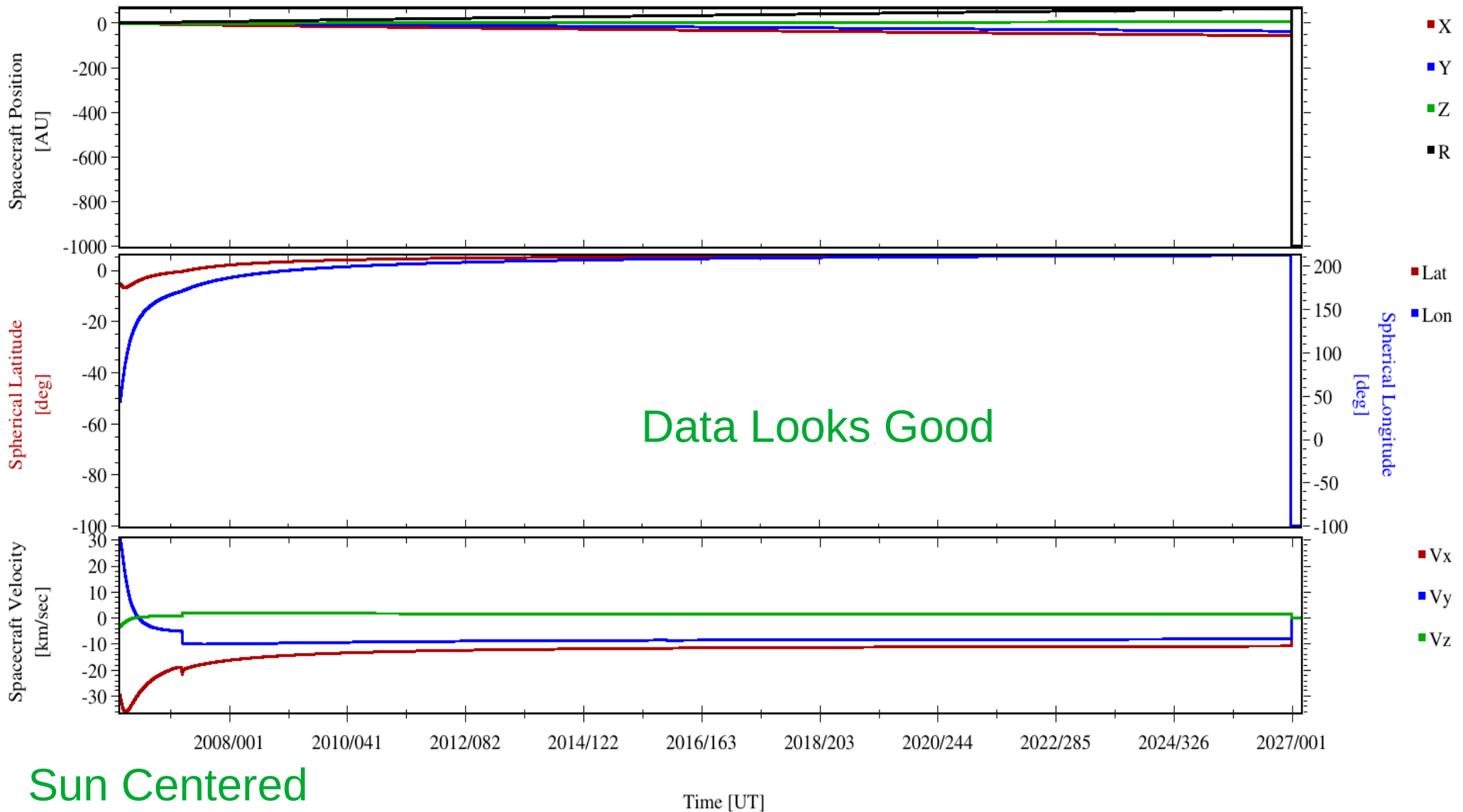
$$(\Delta R_c)^2 = \left( \frac{C^2}{t^4} \right)^2 (\Delta t)^2 + \left( \frac{1}{t} \right)^2 (\Delta C)^2 \quad \text{(Equation 3)}$$

 Incorrect -  $\partial R_c = (-C/t^2) * \partial t$

$$\frac{(\Delta R_c)^2}{R_c^2} = \frac{(\Delta t)^2}{t^2} + \frac{(\Delta C)^2}{C^2} \quad \leftarrow \text{Correct} \quad \text{(Equation 4)}$$

# nh-a-swap-2-kem1-v5.0/document nh-a-swap-3-kem1-v5.0/document traj/traj\_2006\_2027\_1d.tab - HCI

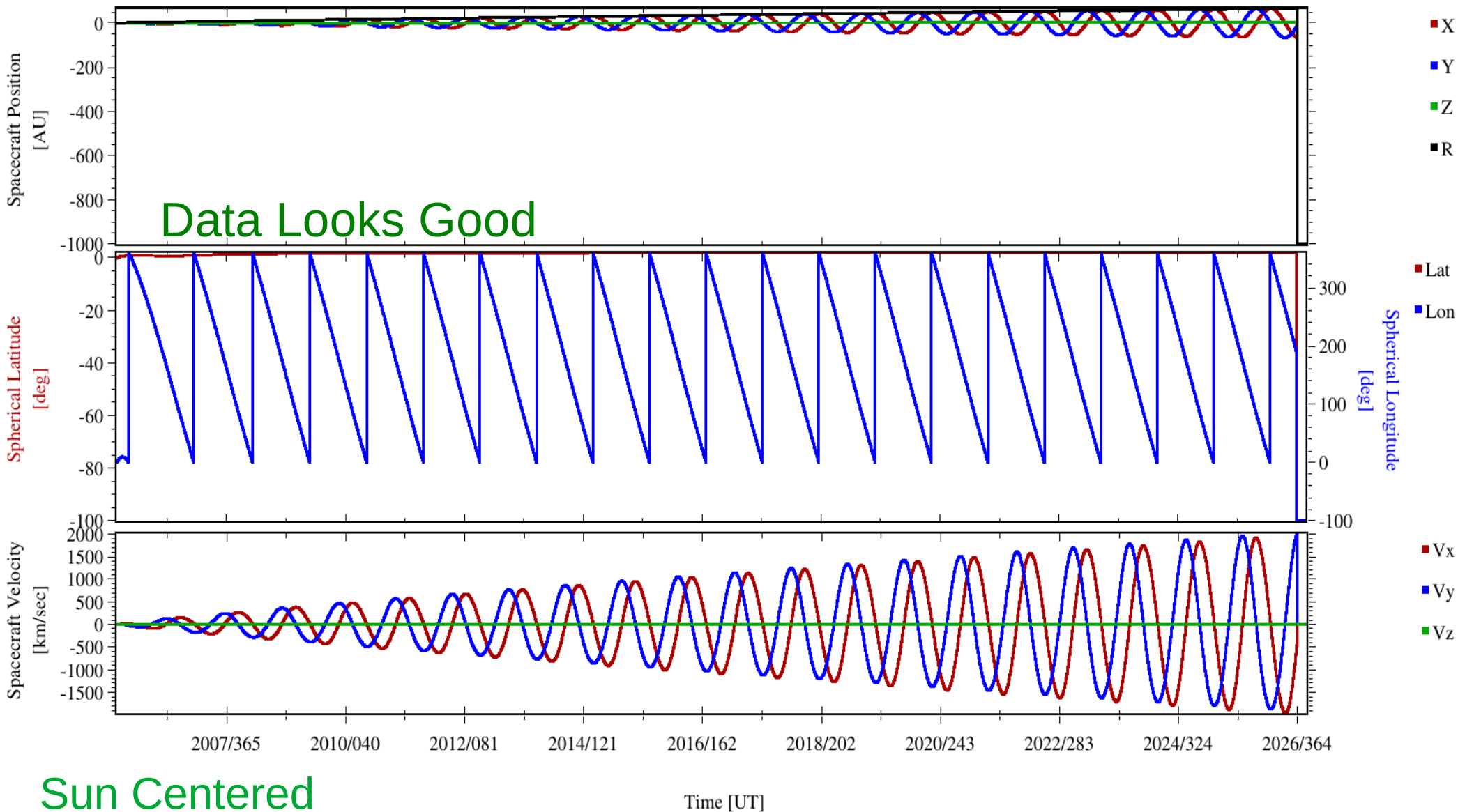
HCI Coordinate System - Sun Center



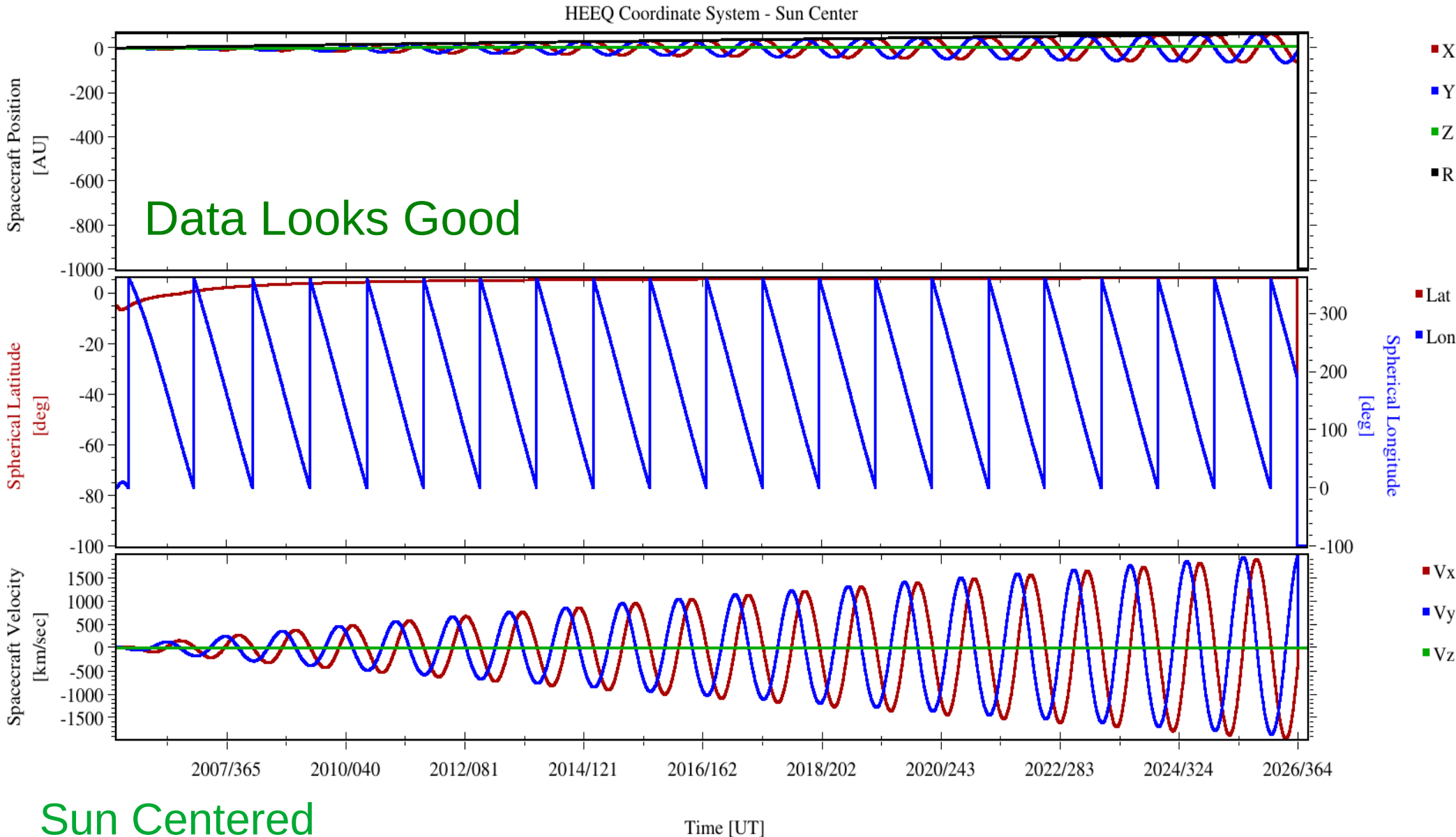
# nh-a-swap-2-kem1-v5.0/document nh-a-swap-3-kem1-v5.0/document traj/traj\_2006\_2027\_1d.tab - HEE

9

HEE Coordinate System - Sun Center

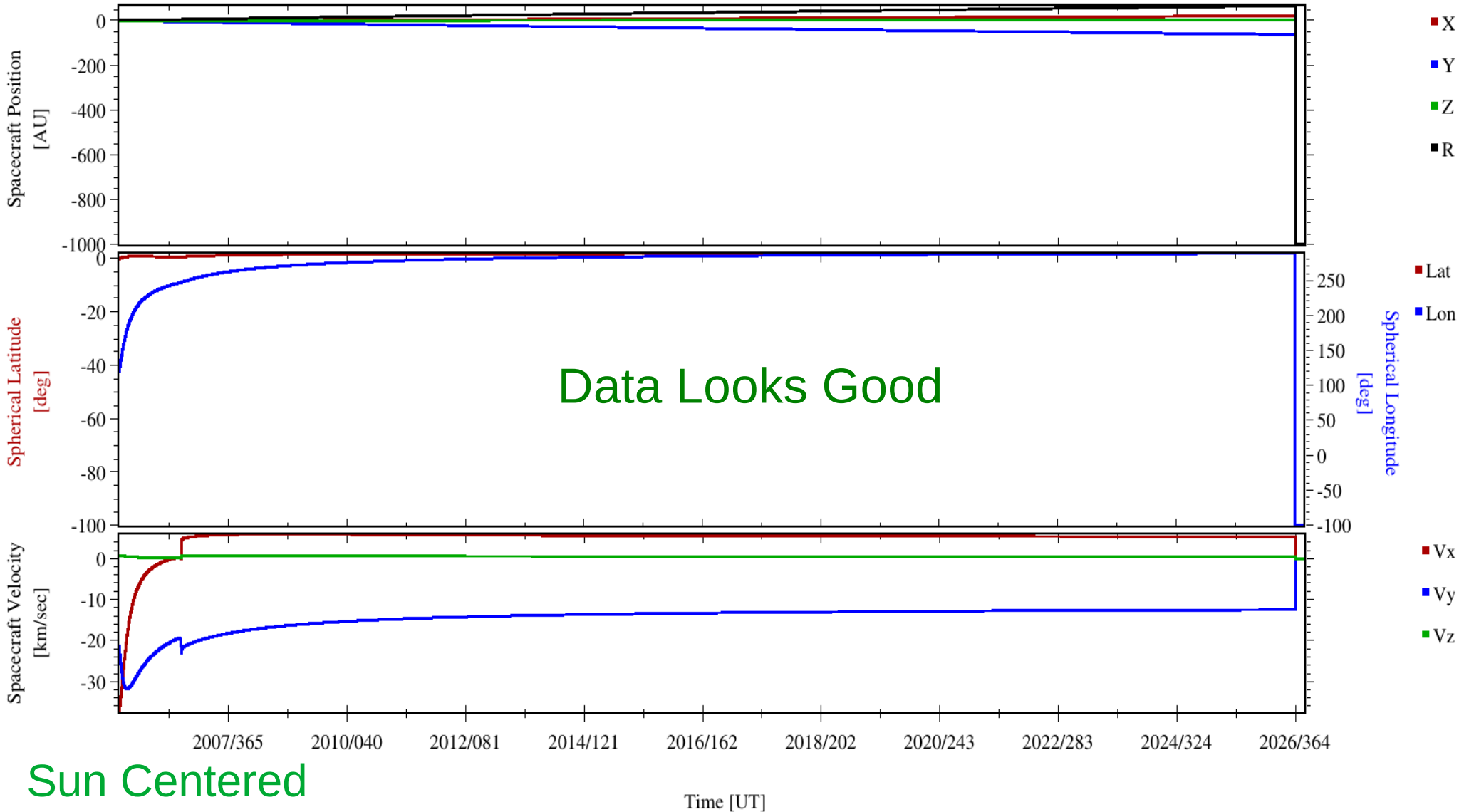


nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
traj/traj\_2006\_2027\_1d.tab - HEEQ



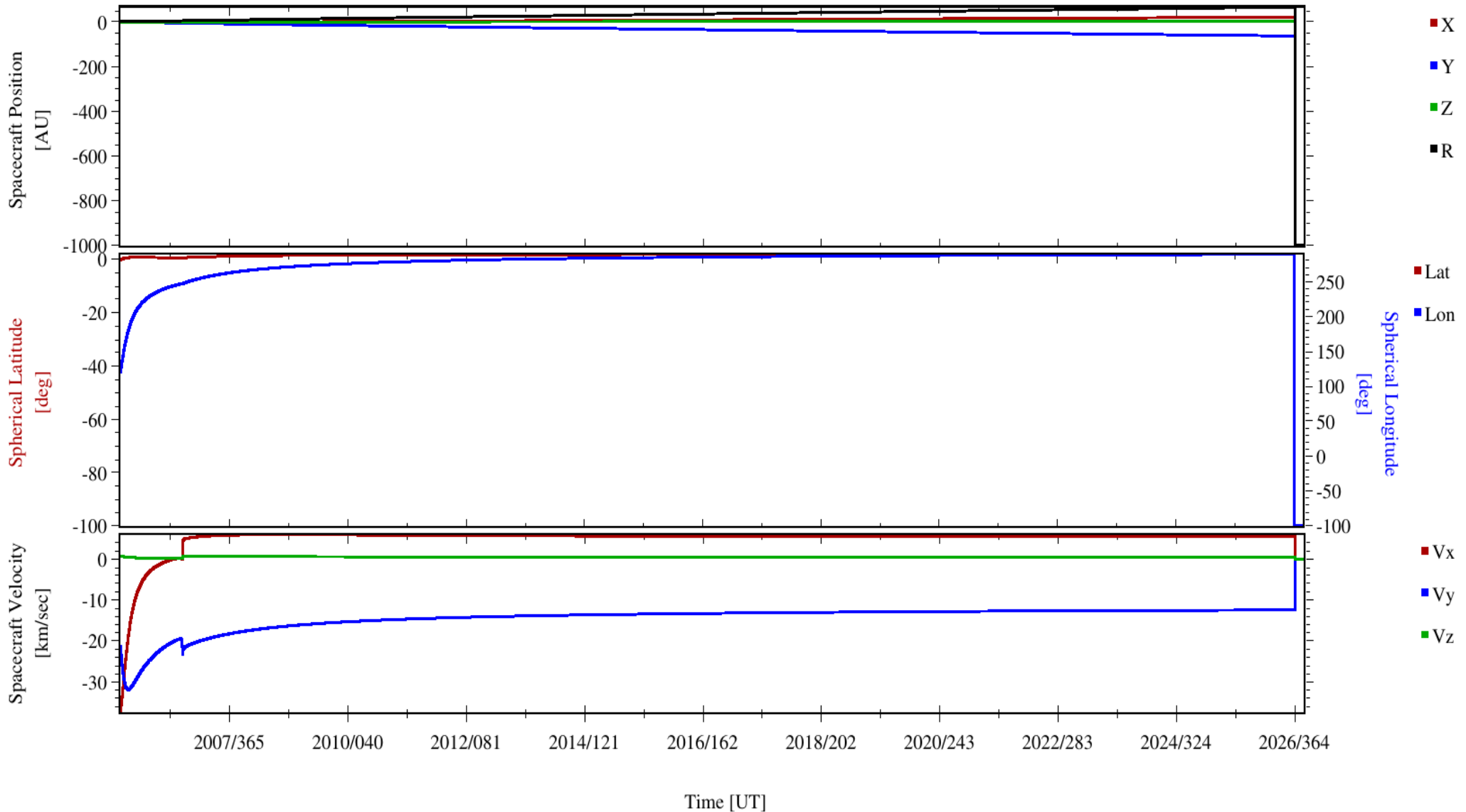
# nh-a-swap-2-kem1-v5.0/document nh-a-swap-3-kem1-v5.0/document traj/traj\_2006\_2027\_1d.tab - ECLIPJ2000

ECLIPJ2000 or HAE\_J2000 Coordinate System - Sun Center



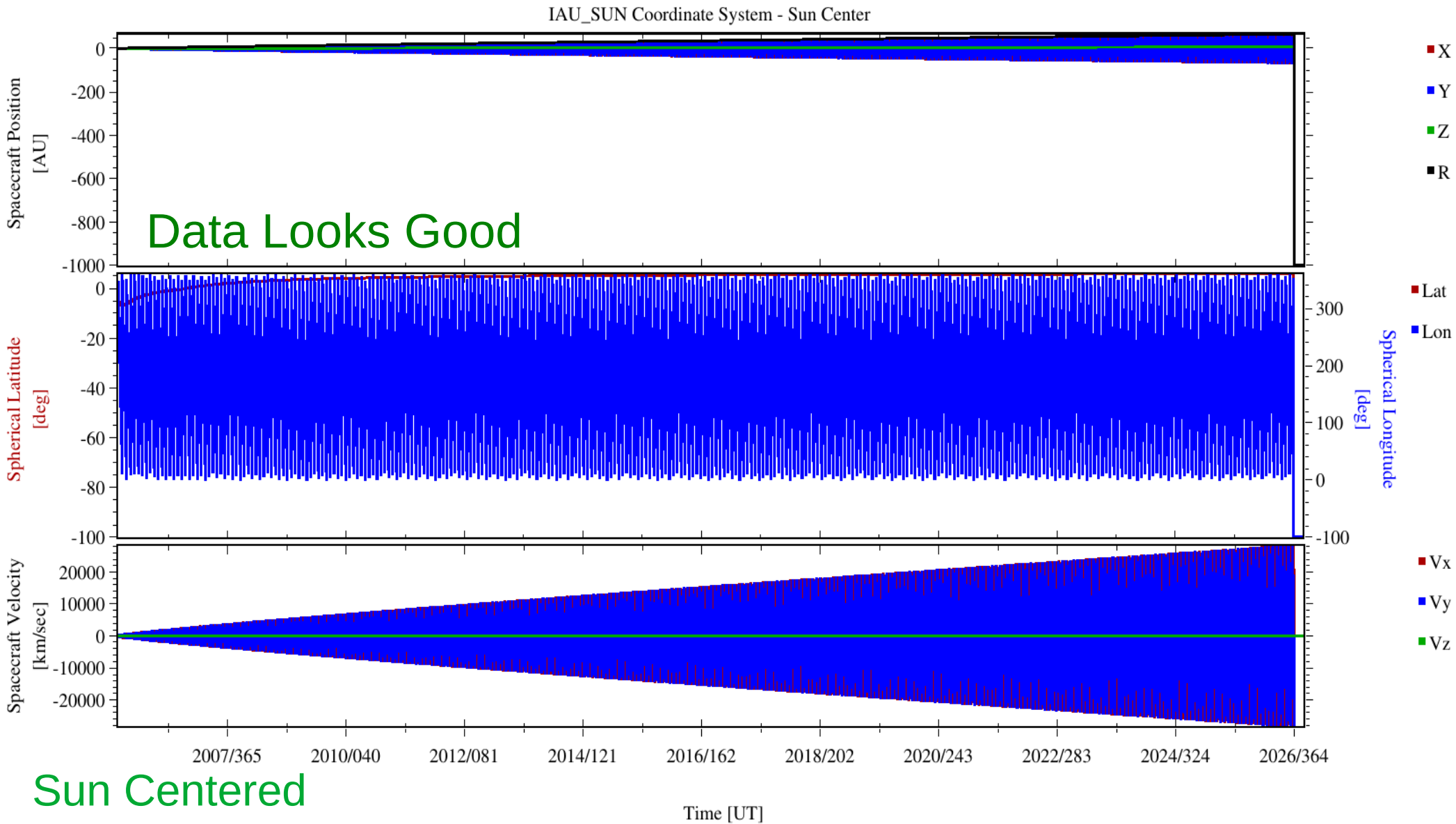
# nh-a-swap-2-kem1-v5.0/document nh-a-swap-3-kem1-v5.0/document traj/traj\_2006\_2027\_1d.tab - ECLIPDATE

ECLIPDATE or HAE\_DATE Coordinate System - Sun Center

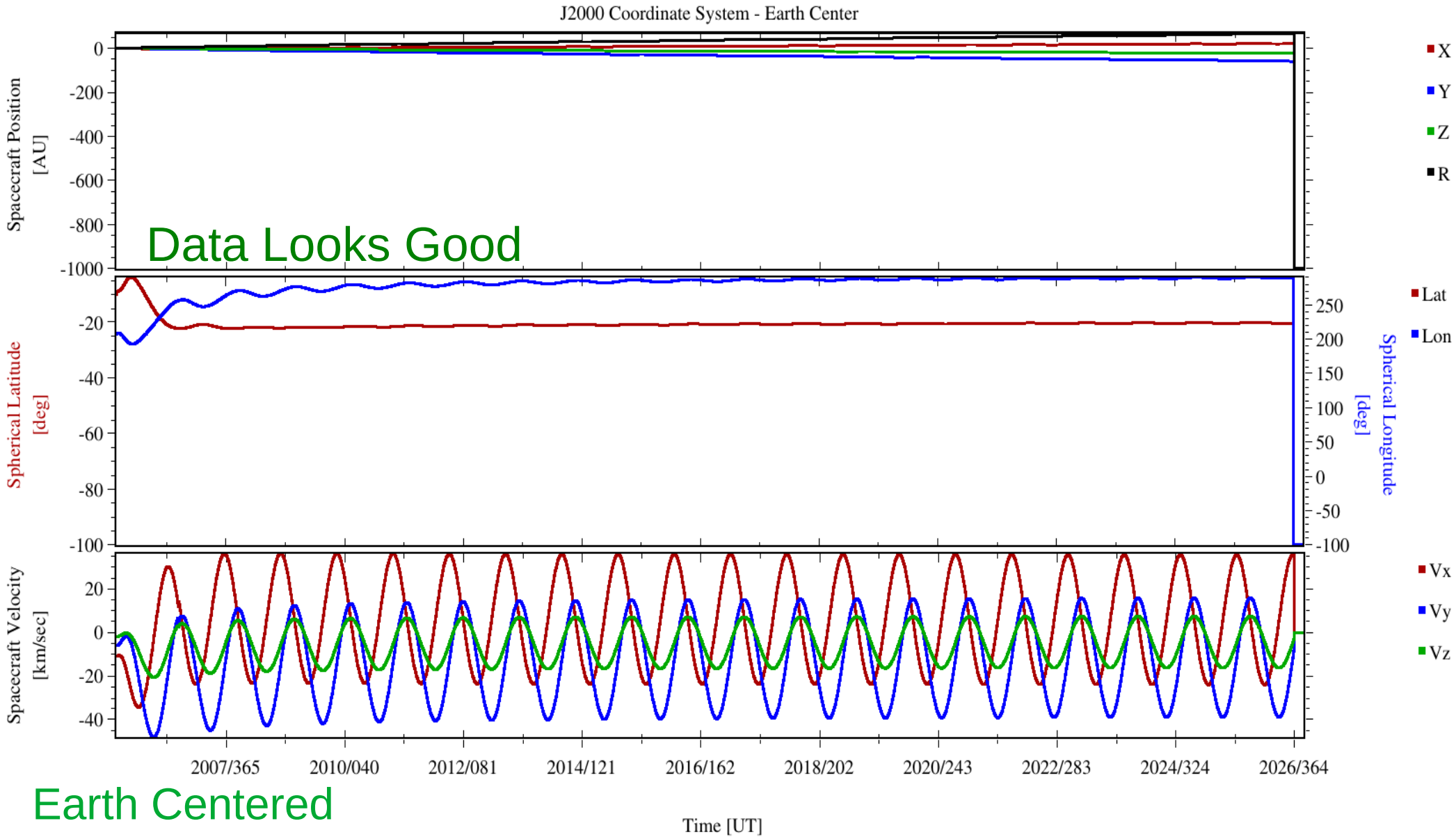




# nh-a-swap-2-kem1-v5.0/document nh-a-swap-3-kem1-v5.0/document traj/traj\_2006\_2027\_1d.tab - IAU\_SUN

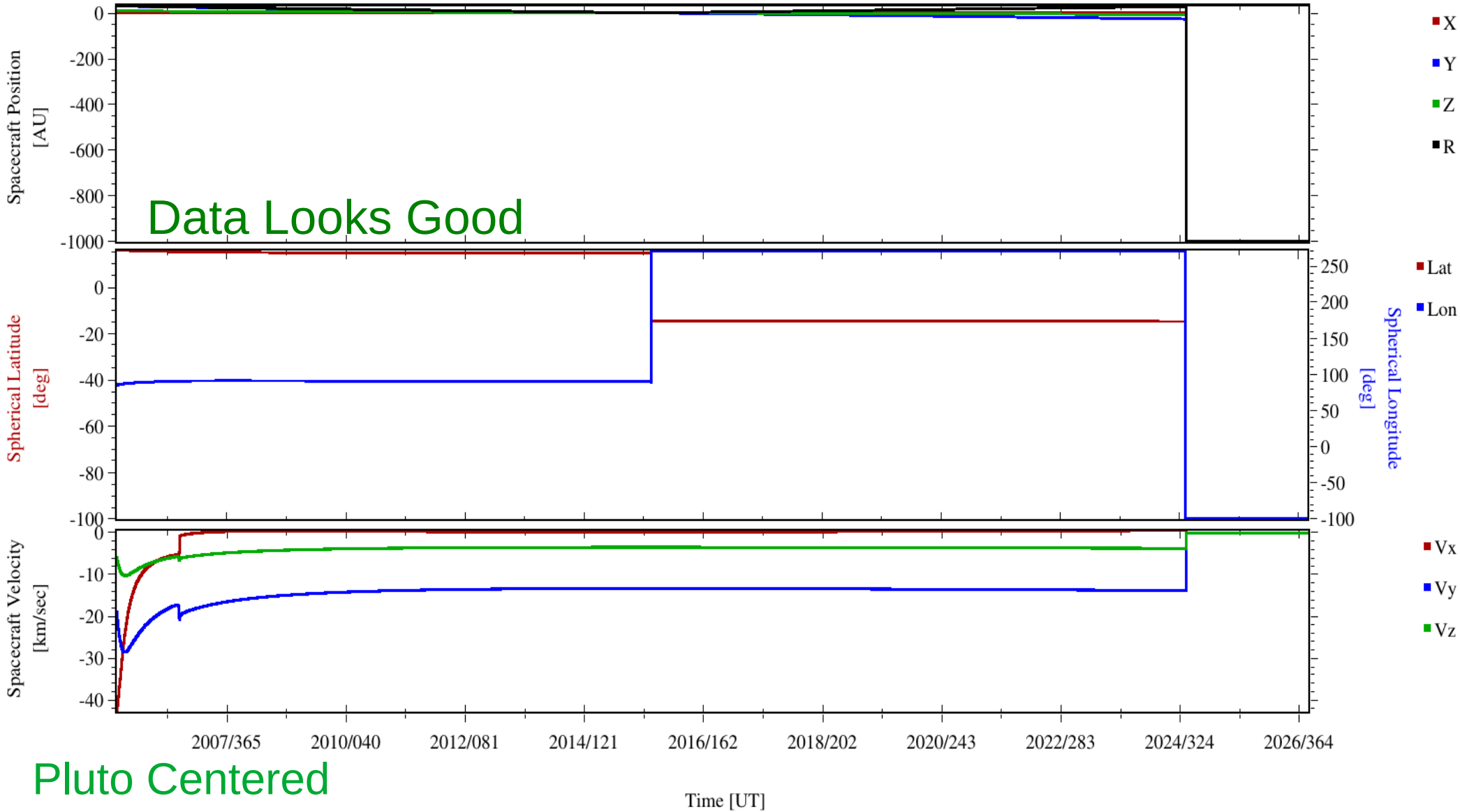


nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
traj/traj\_2006\_2027\_1d.tab - J2000



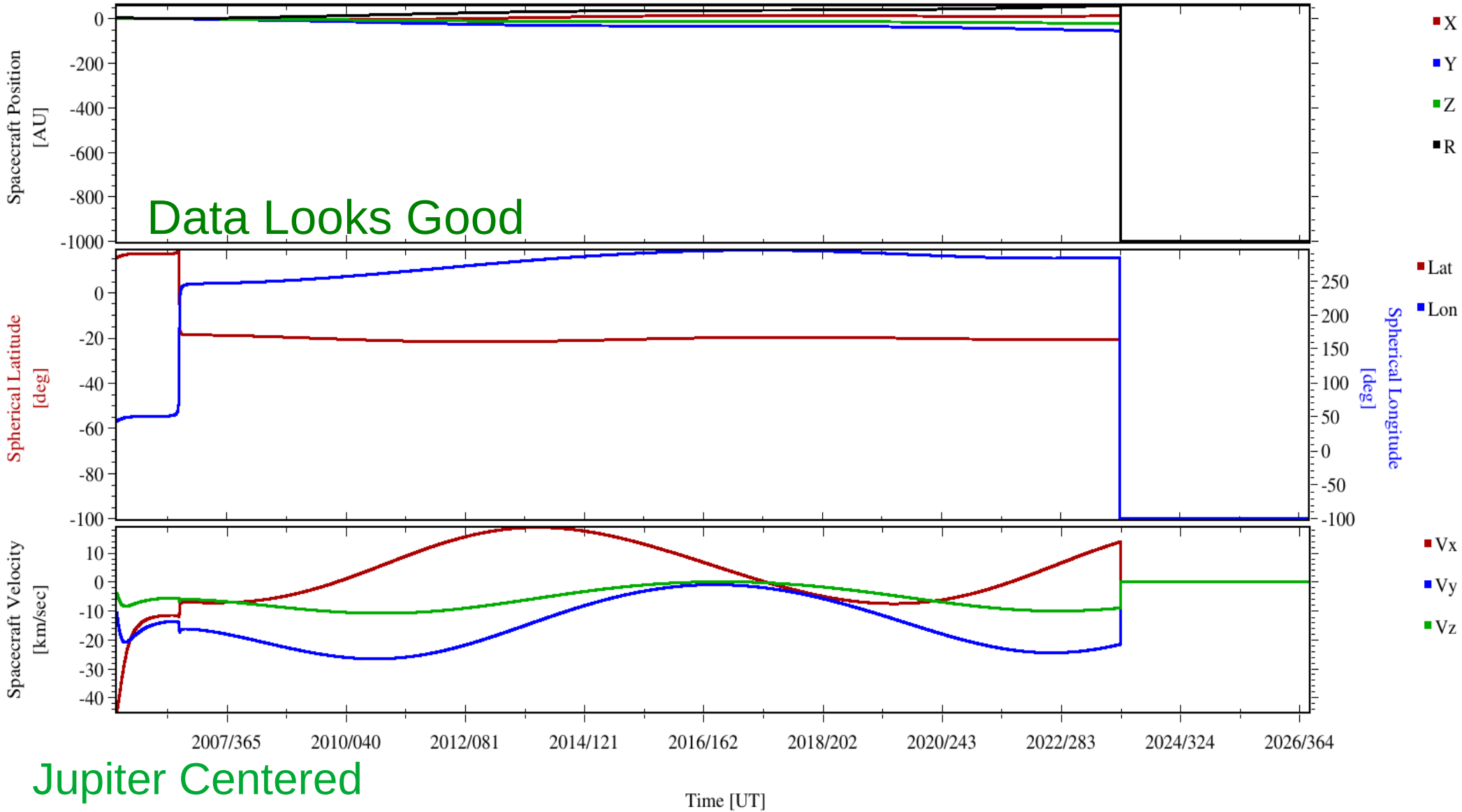
nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
traj/traj\_2006\_2027\_1d.tab - J2000

J2000 Coordinate System - Pluto Center



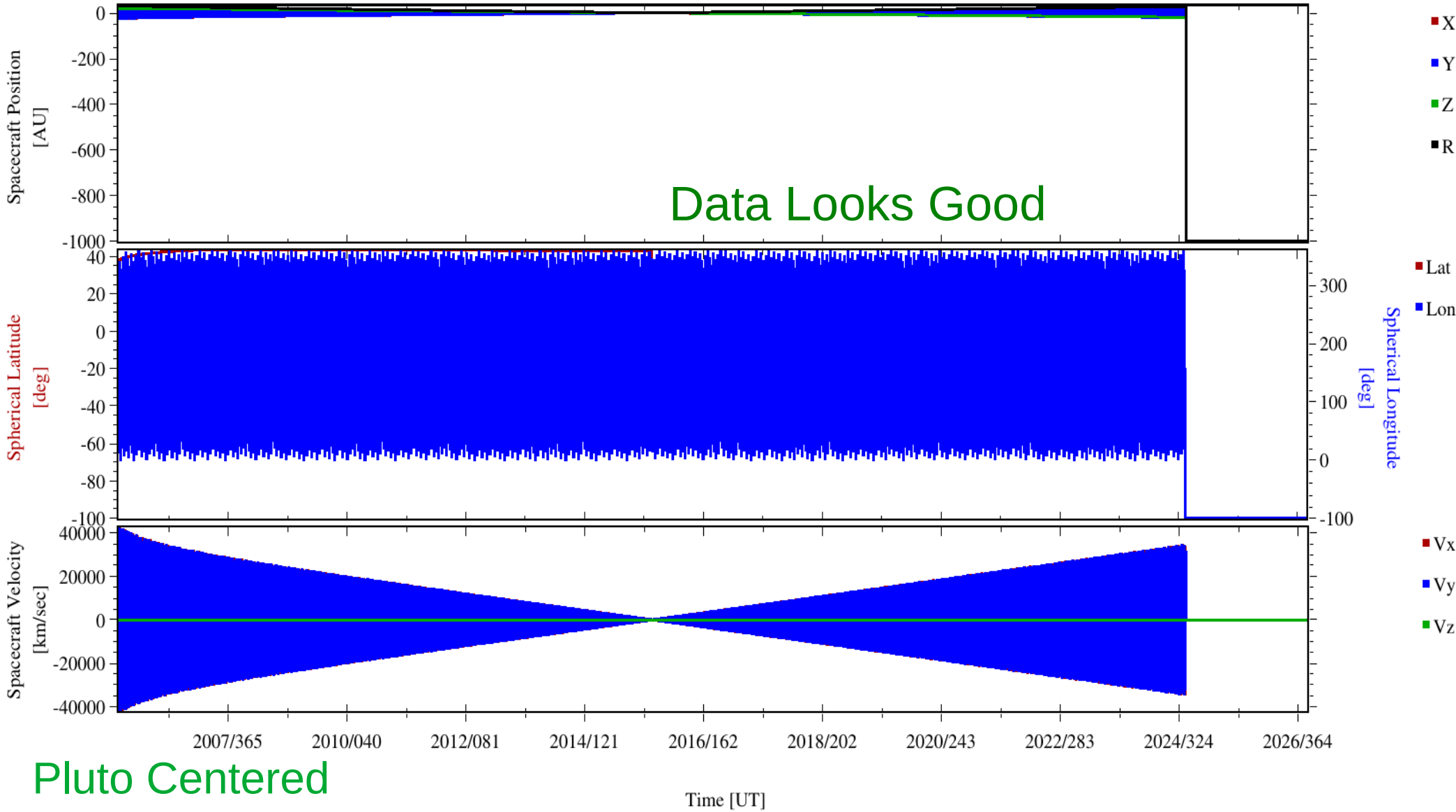
nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
traj/traj\_2006\_2027\_1d.tab - J2000

J2000 Coordinate System - Jupiter Center



# nh-a-swap-2-kem1-v5.0/document nh-a-swap-3-kem1-v5.0/document traj/traj\_2006\_2027\_1d.tab - IAU\_PLUTO

IAU\_PLUTO Coordinate System - Pluto Center

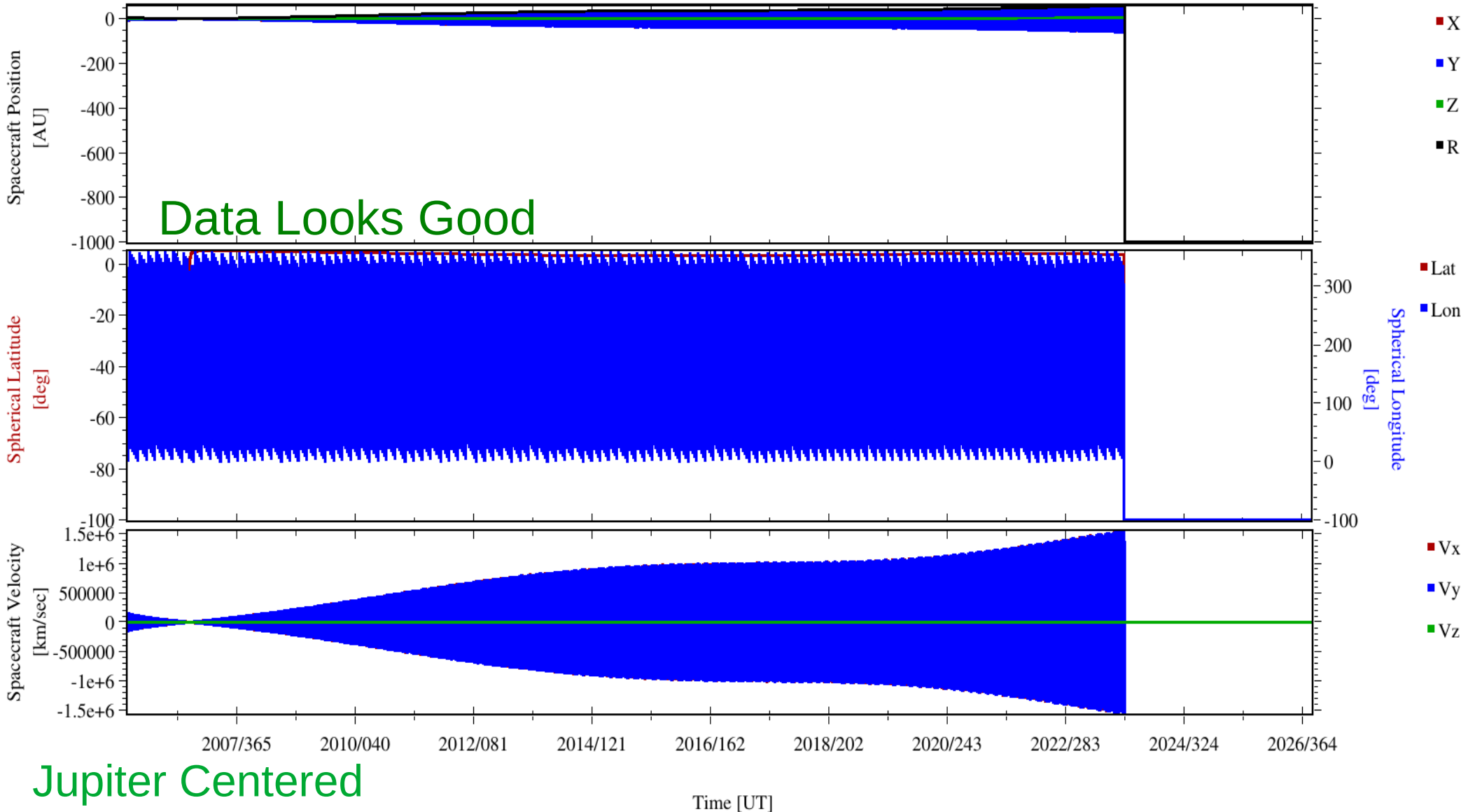


Pluto Centered

Time [UT]

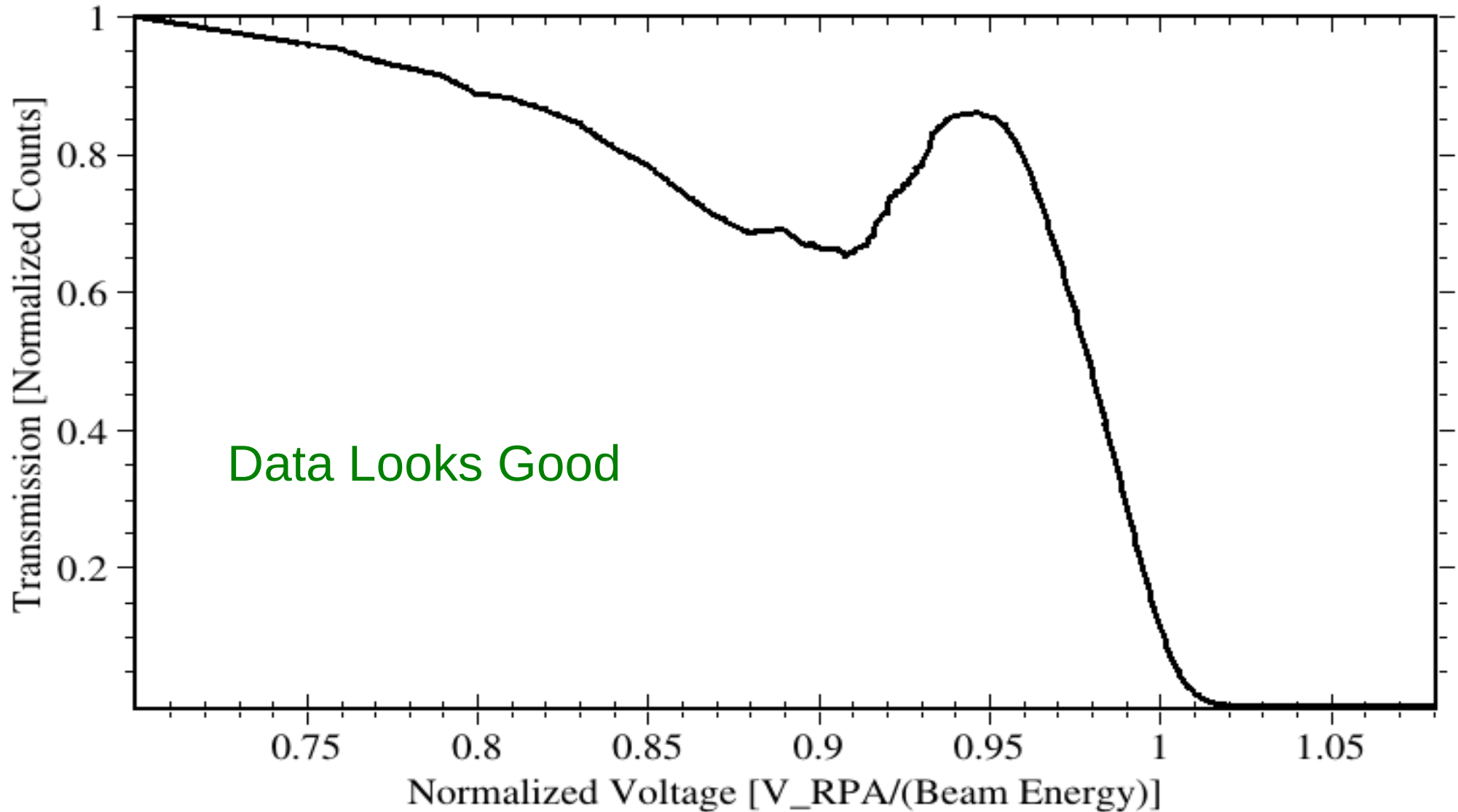
# nh-a-swap-2-kem1-v5.0/document nh-a-swap-3-kem1-v5.0/document traj/traj\_2006\_2027\_1d.tab - IAU\_JUPITER

IAU\_JUPITER Coordinate System - Jupiter Center



nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
rpa\_shape.tab

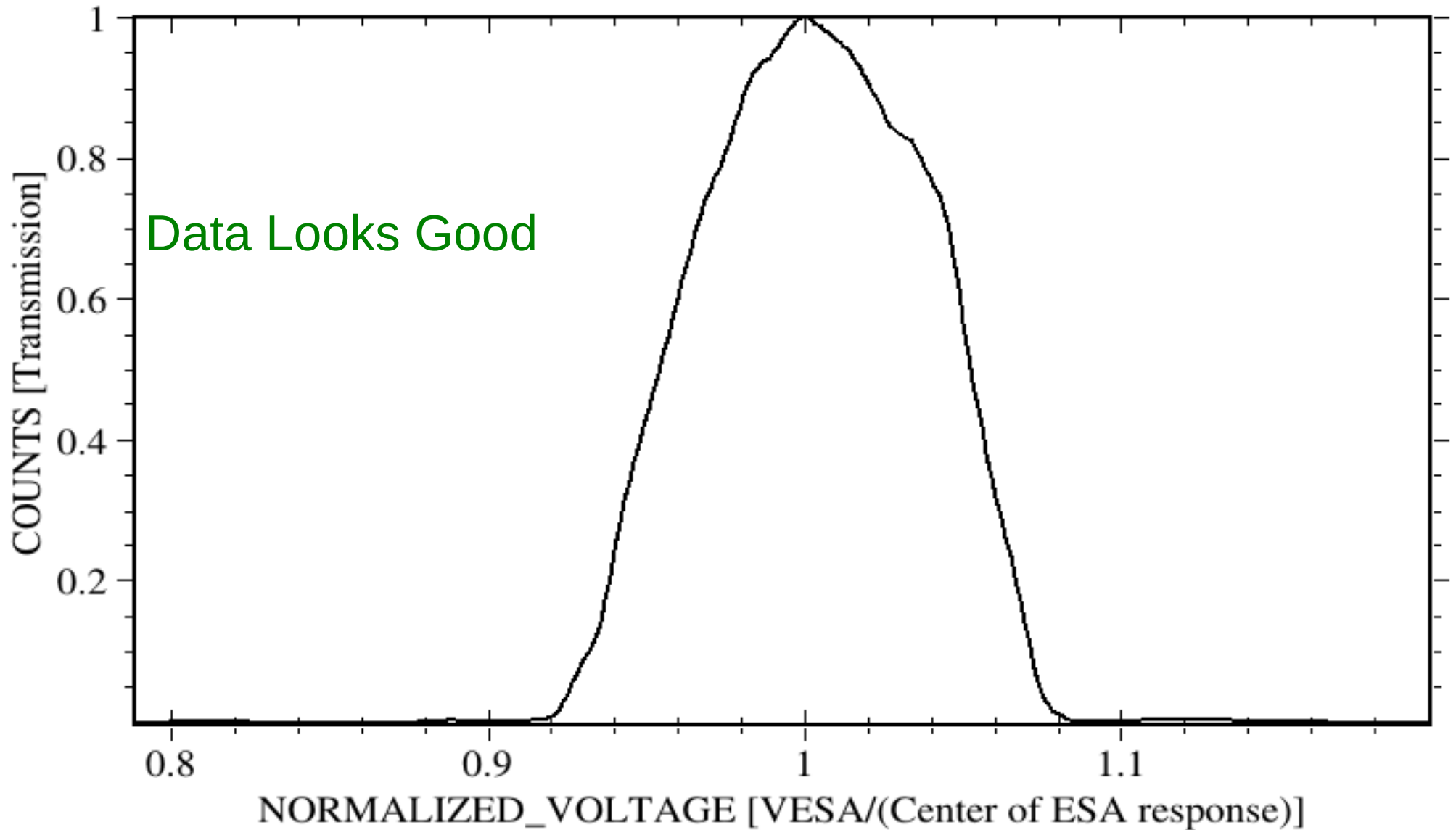
RPA Response Curve



Data Looks Good

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
esa\_shape.tab  
SWAP esa\_shape.tab

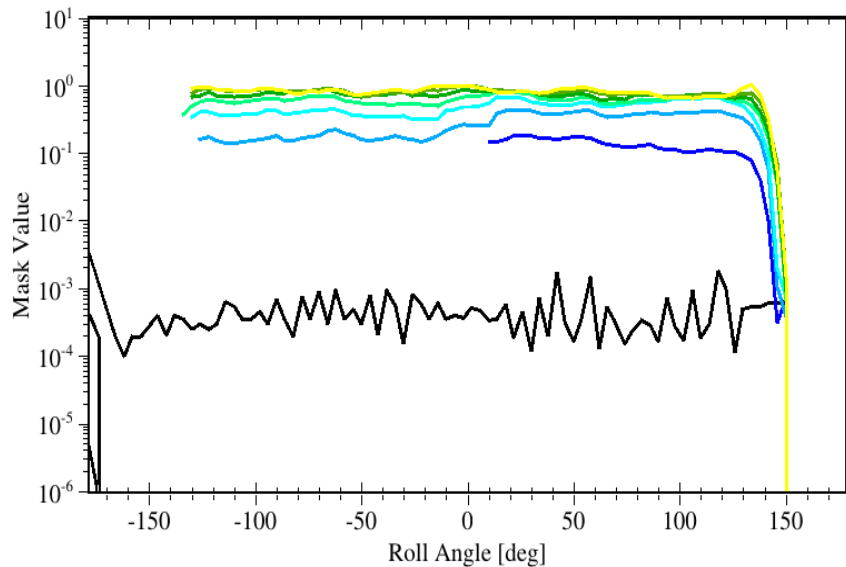
20



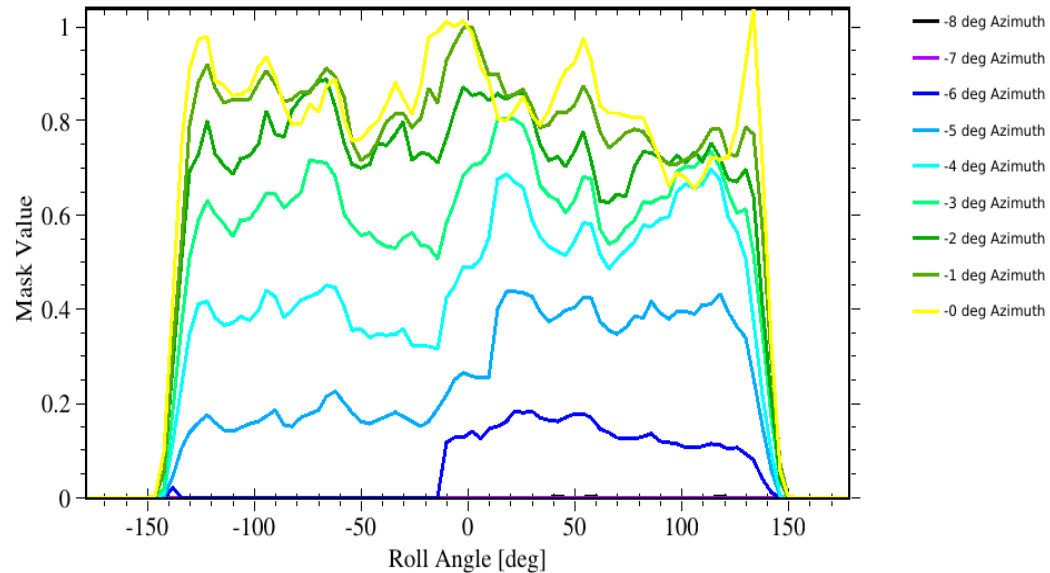


# nh-a-swap-2-kem1-v5.0/calib nh-a-swap-3-kem1-v5.0/calib fov\_mask\_2d.tab

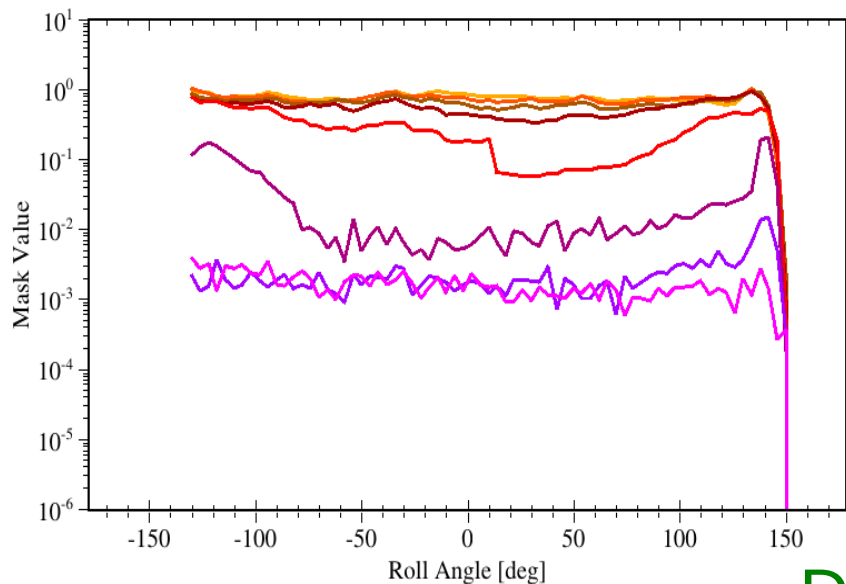
SWAP FOV Mask (Negative Azimuth)



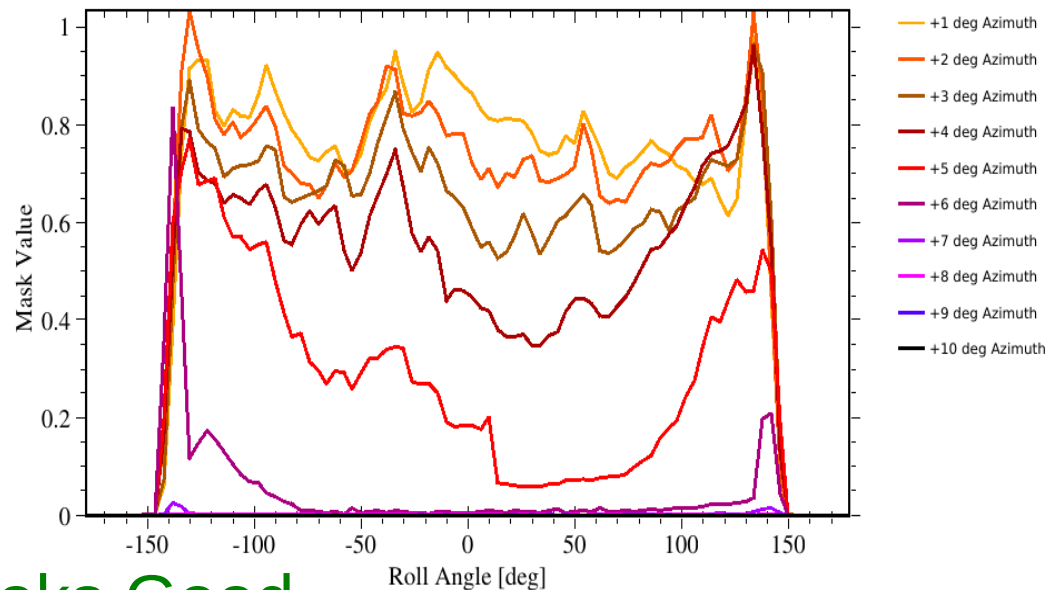
SWAP FOV Mask (Negative Azimuth)



SWAP FOV Mask (Positive Azimuth)



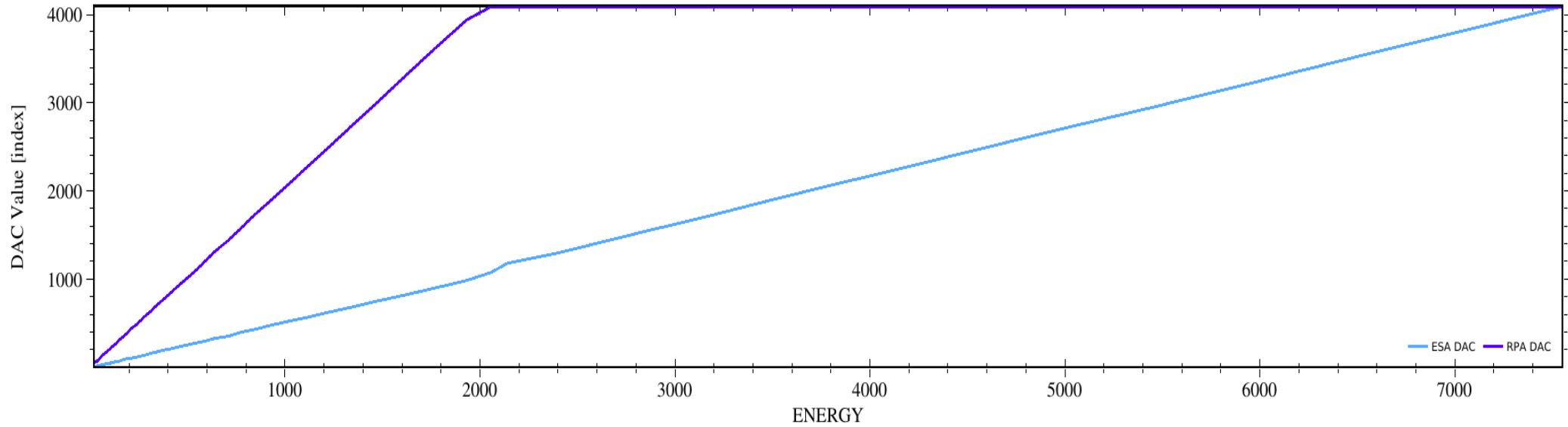
SWAP FOV Mask (Positive Azimuth)



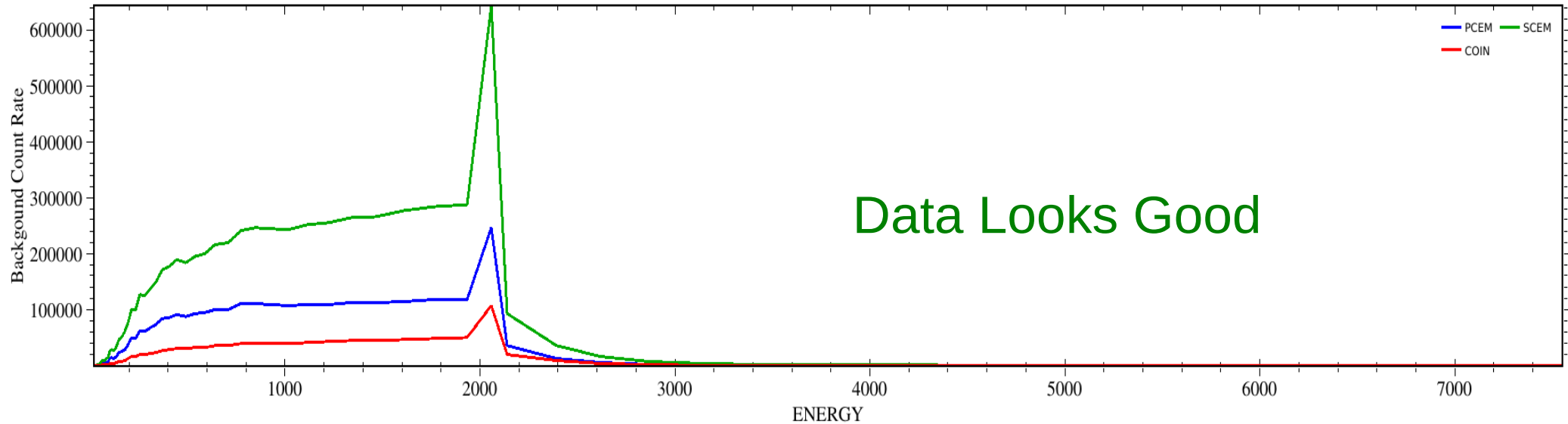
Data Looks Good

# nh-a-swap-2-kem1-v5.0/calib nh-a-swap-3-kem1-v5.0/calib background\_009\_dac.tab

SWAP background\_009\_dac.tab: Plan 3, Sweep 3



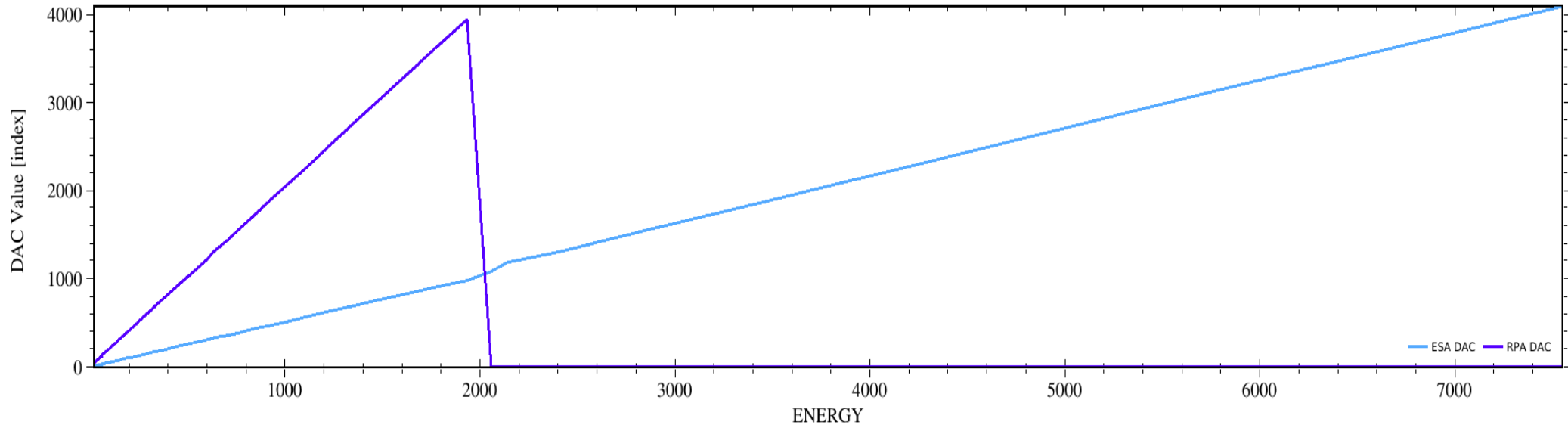
SWAP background\_009\_dac.tab: Plan 3, Sweep 3



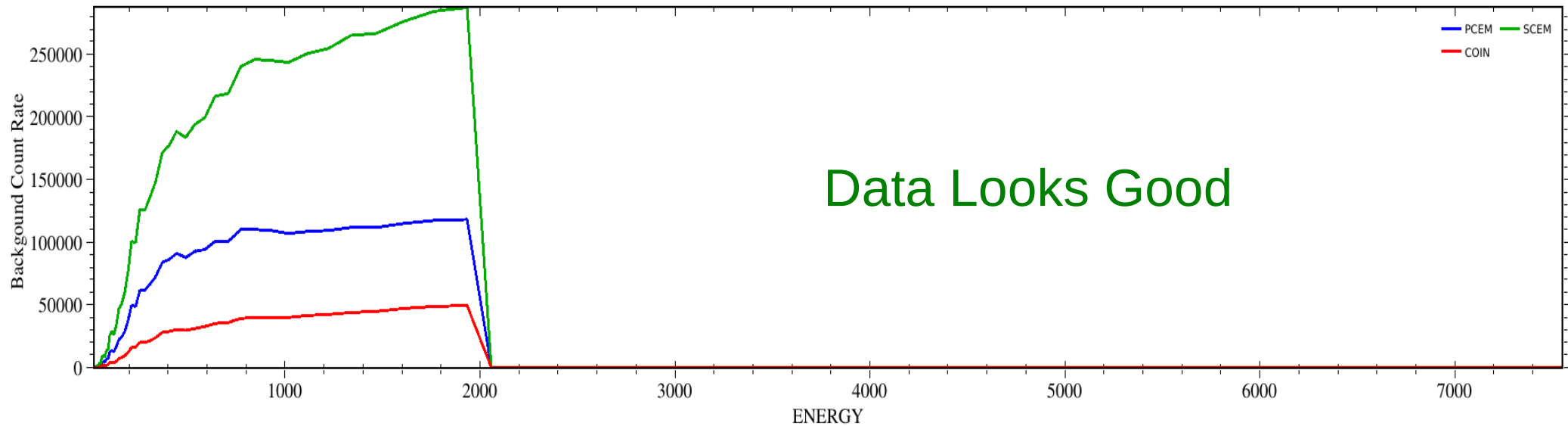
Data Looks Good

# nh-a-swap-2-kem1-v5.0/calib nh-a-swap-3-kem1-v5.0/calib background\_009\_dac\_jup.tab

SWAP background\_009\_dac\_jup.tab: Plan 0, Sweep 0

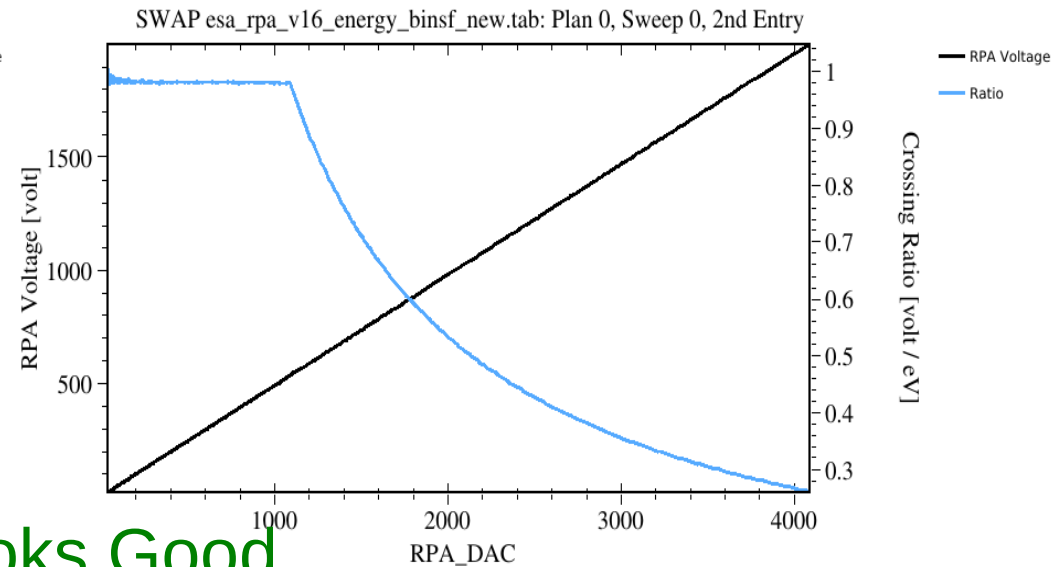
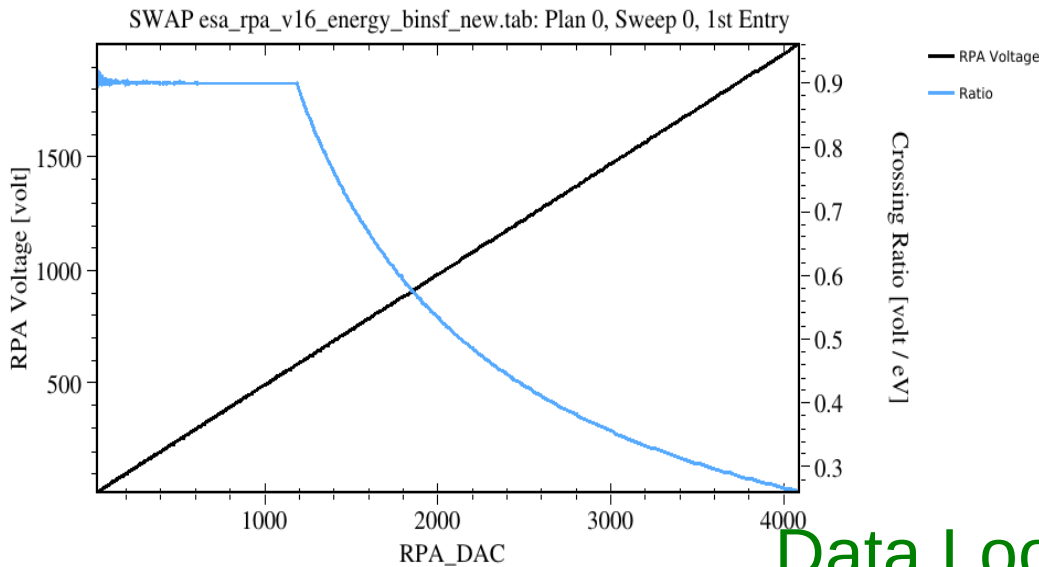
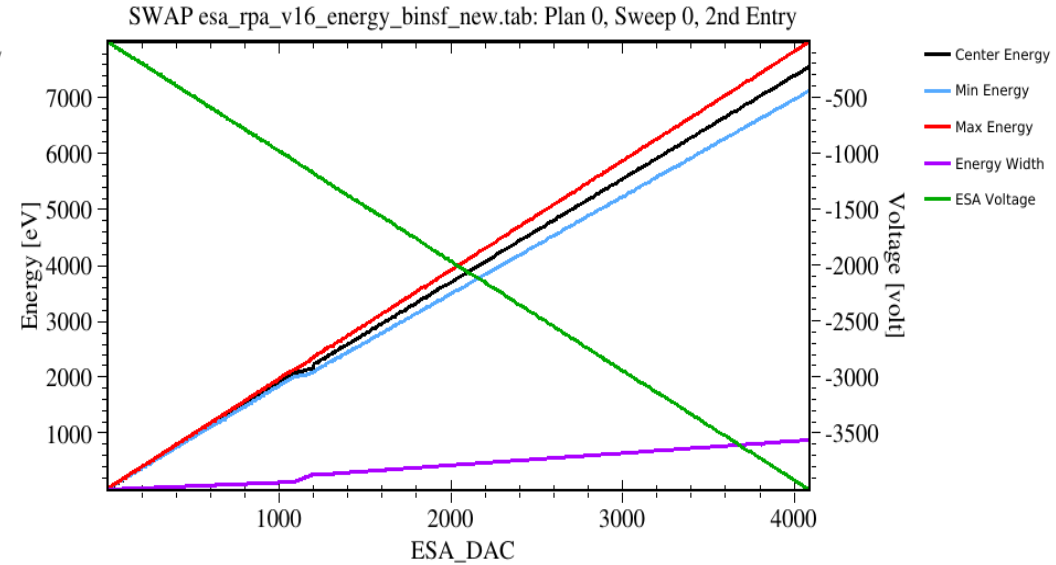
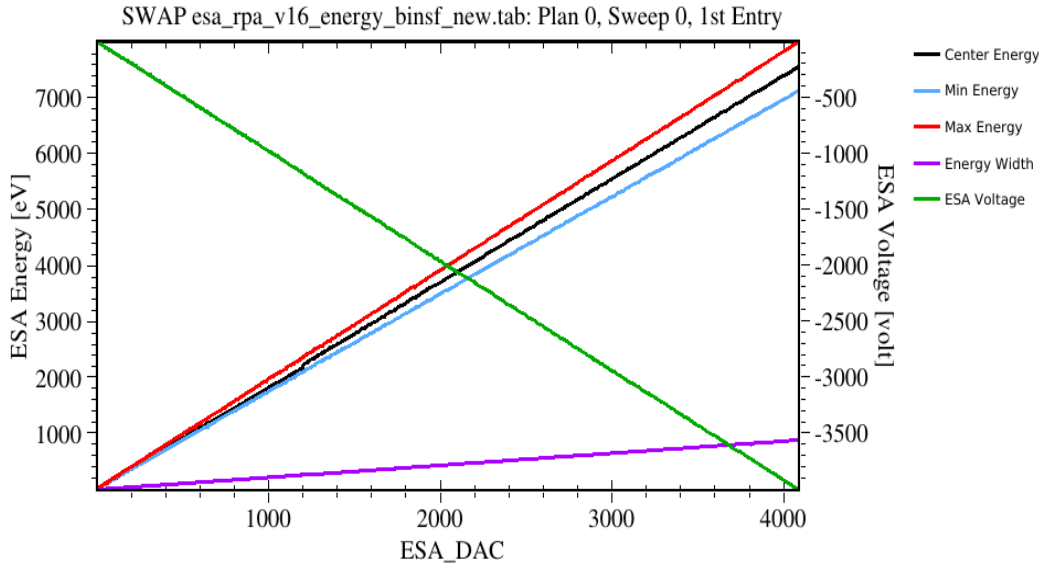


SWAP background\_009\_dac\_jup.tab: Plan 0, Sweep 0



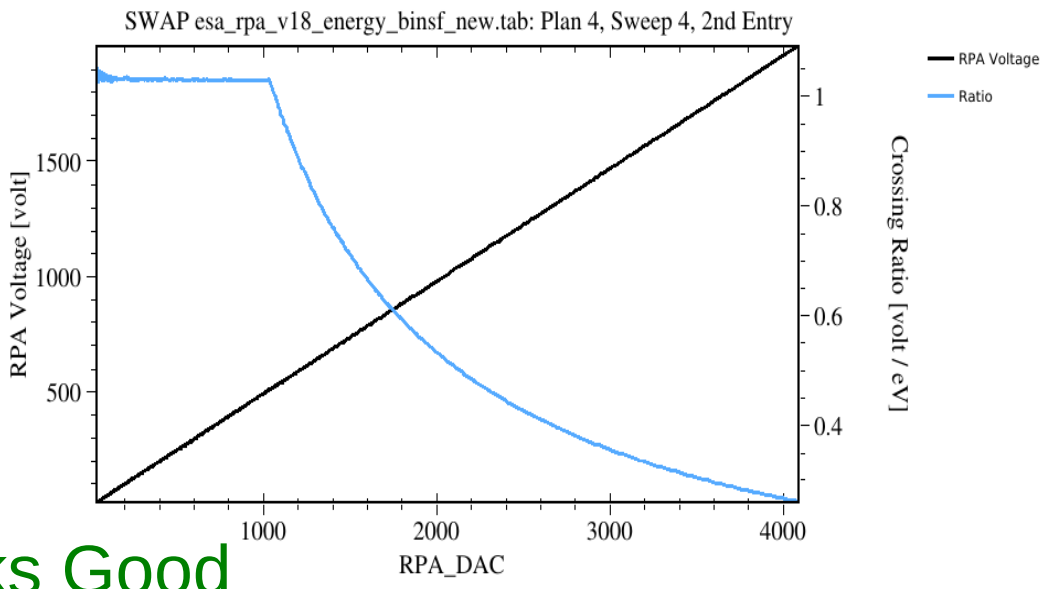
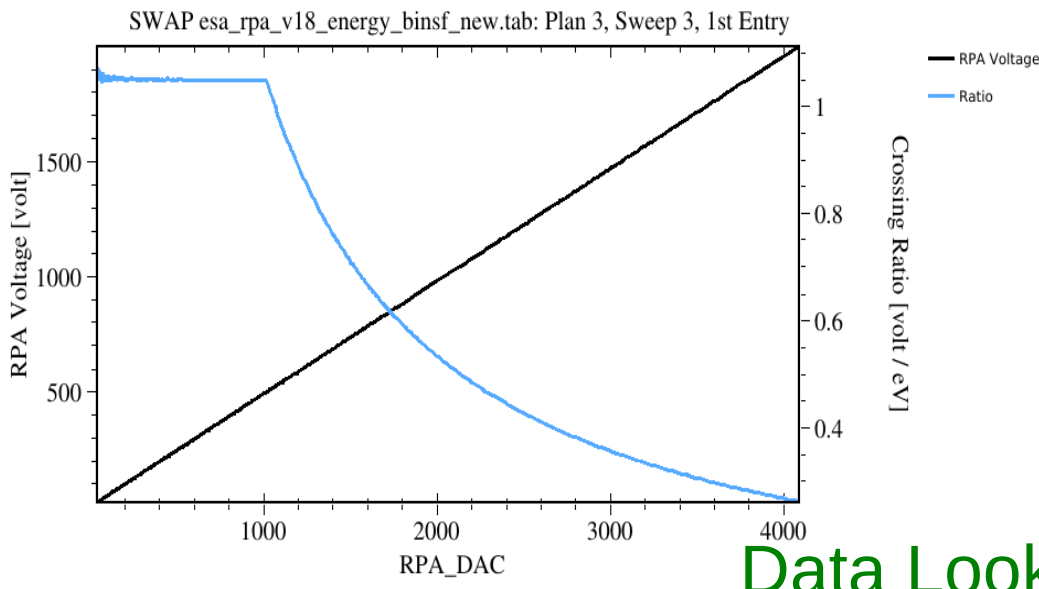
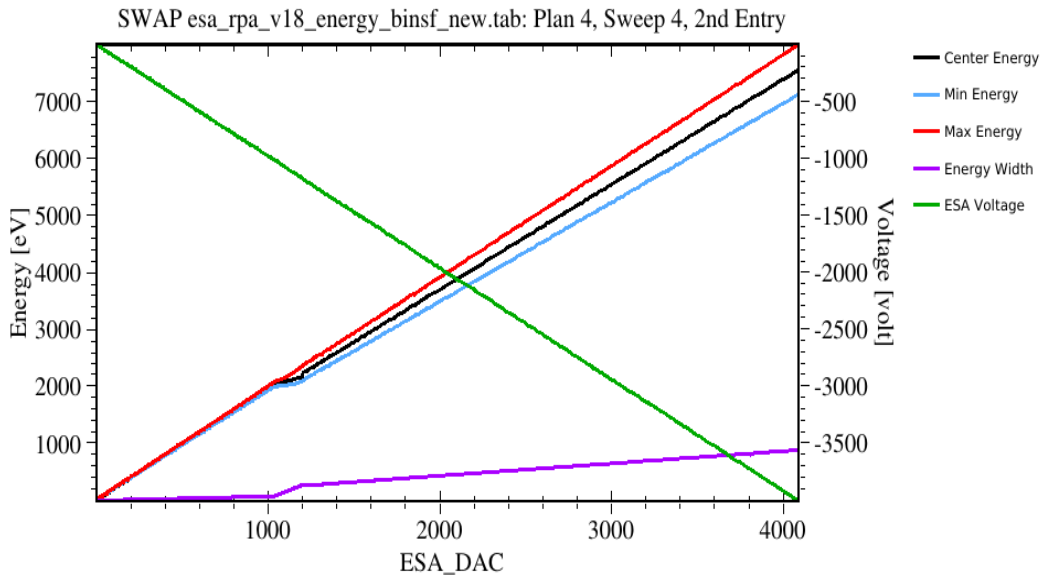
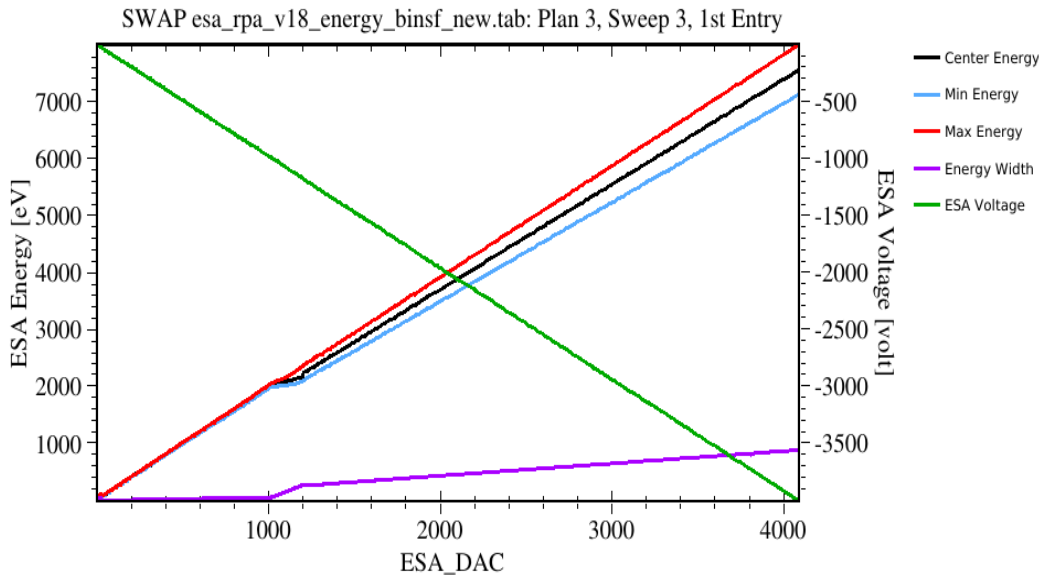
Data Looks Good

# nh-a-swap-2-kem1-v5.0/calib nh-a-swap-3-kem1-v5.0/calib esa\_rpa\_v16\_energy\_binsf\_new.tab



Data Looks Good

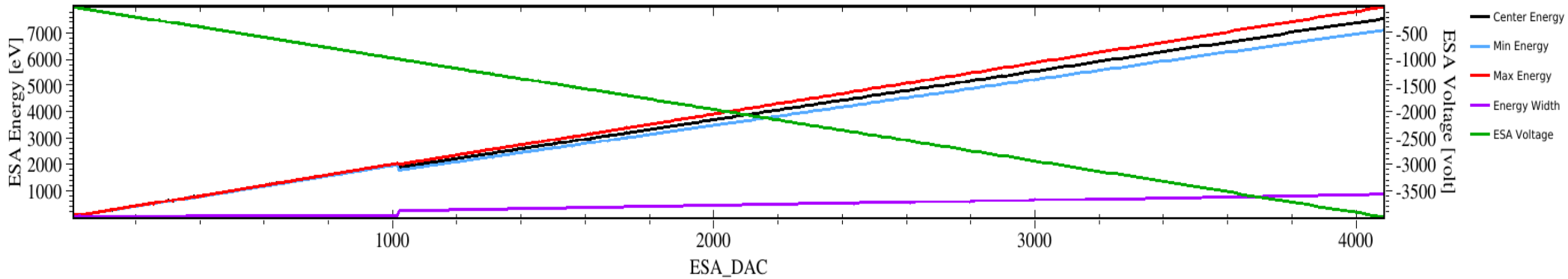
# nh-a-swap-2-kem1-v5.0/calib nh-a-swap-3-kem1-v5.0/calib esa\_rpa\_v18\_energy\_binsf\_new.tab



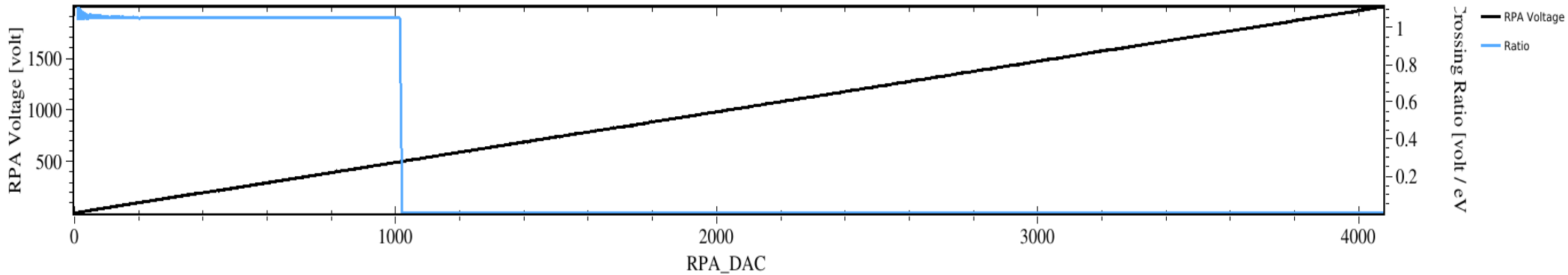
Data Looks Good

# nh-a-swap-2-kem1-v5.0/calib nh-a-swap-3-kem1-v5.0/calib esa\_rpa\_v19\_energy\_binsf\_new2.tab

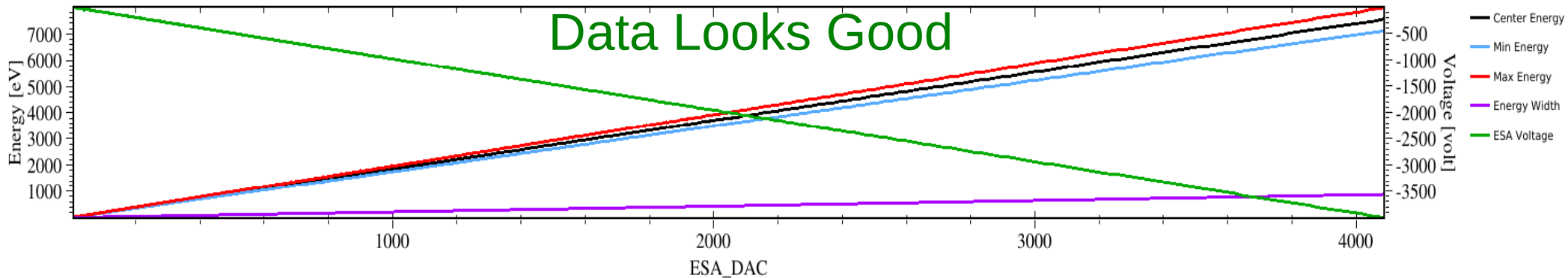
SWAP esa\_rpa\_v19\_energy\_binsf\_new2.tab: Plan 0, Sweep 0, 1st Entry



SWAP esa\_rpa\_v19\_energy\_binsf\_new2.tab: Plan 0, Sweep 0, 1st Entry

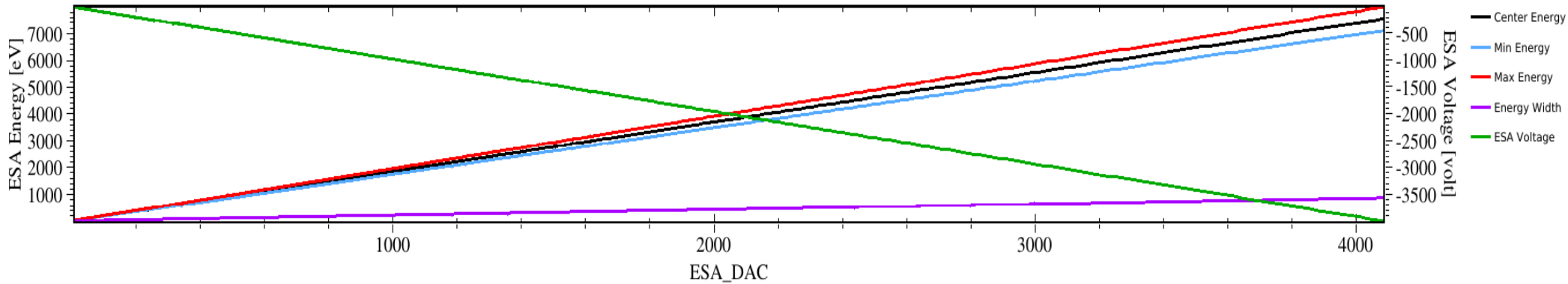


SWAP esa\_rpa\_v19\_energy\_binsf\_new2.tab: Plan 5, Sweep 5, 2nd Entry

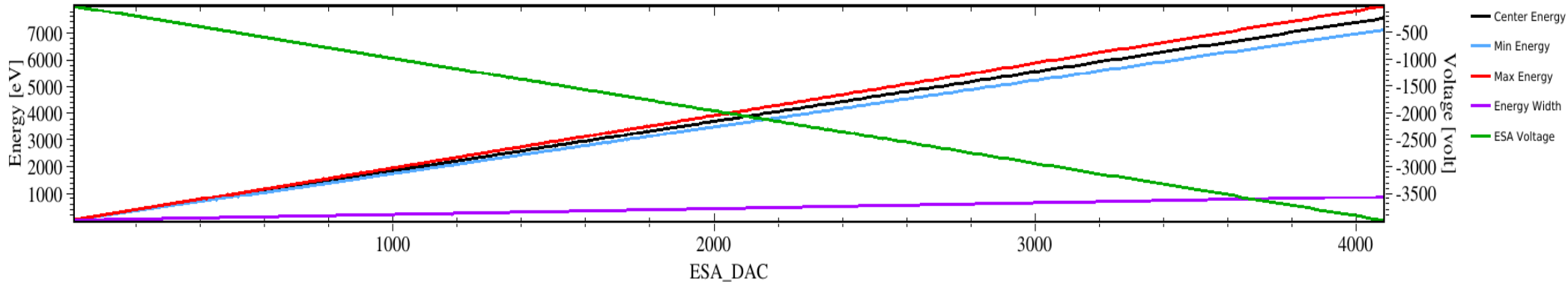


# nh-a-swap-2-kem1-v5.0/calib nh-a-swap-3-kem1-v5.0/calib esa\_rpa\_v19\_energy\_binsf\_new2.tab

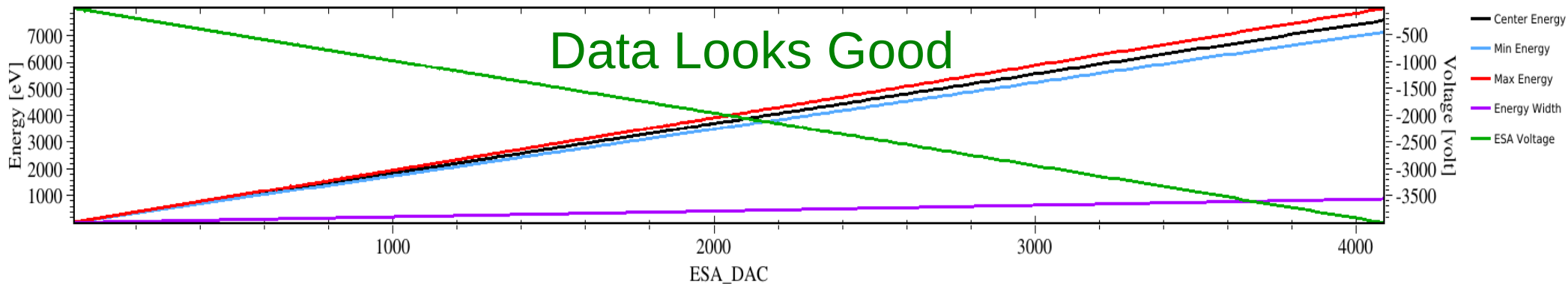
SWAP esa\_rpa\_v19\_energy\_binsf\_new2.tab: Plan 2, Sweep 2, 3rd Entry



SWAP esa\_rpa\_v19\_energy\_binsf\_new2.tab: Plan 12, Sweep 10, 4th Entry



SWAP esa\_rpa\_v19\_energy\_binsf\_new2.tab: Plan 12, Sweep 11, 5th Entry



# **SWAP RAW and CALIBRATED Data Evaluation**



# nh-a-swap-3-kem1-v5.0/data

## Histogram Data (0x586)

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The following files would not process:

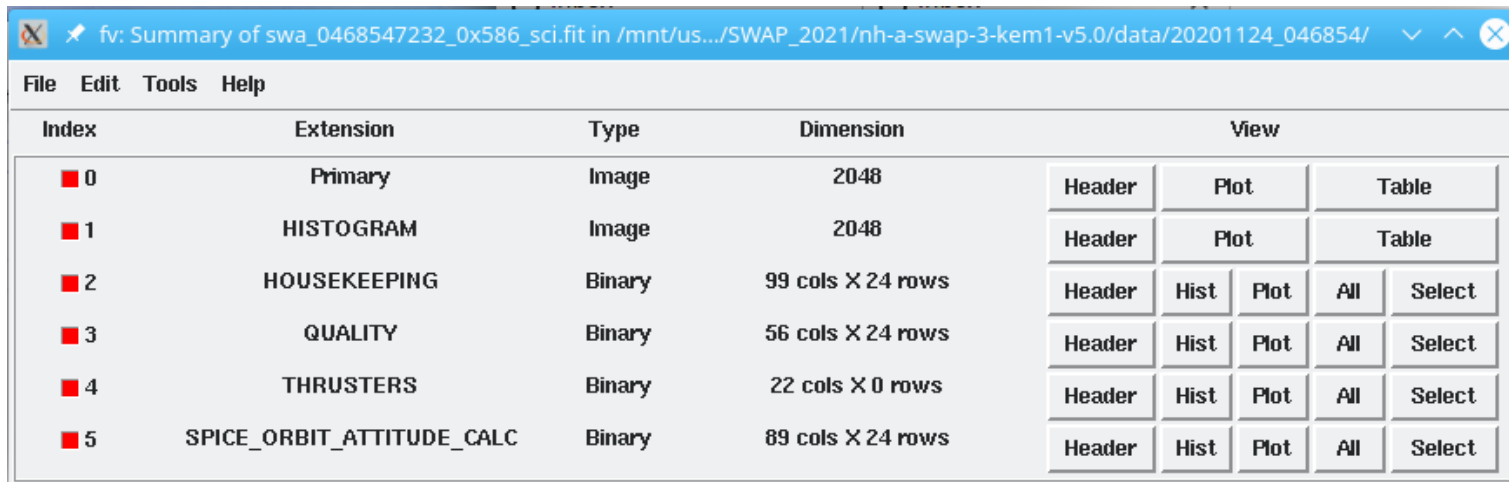
```
swa_0476064032_0x586_sci.fit  
swa_0476068192_0x586_sci.fit  
swa_0476150432_0x586_sci.fit  
swa_0476236832_0x586_sci.fit  
swa_0476323232_0x586_sci.fit  
swa_0476409632_0x586_sci.fit  
swa_0476496032_0x586_sci.fit
```

Examination showed that the fits file HDU is different than that described in the ICD. The format of these files are different from the rest of the Histogram fits files and disagree with the ICD. The label files which go along with the above data files appear to describe the format of the above data files. These files are the last 7 which appear within the data set.

# nh-a-swap-3-kem1-v5.0/data Histogram Data (0x586)

30

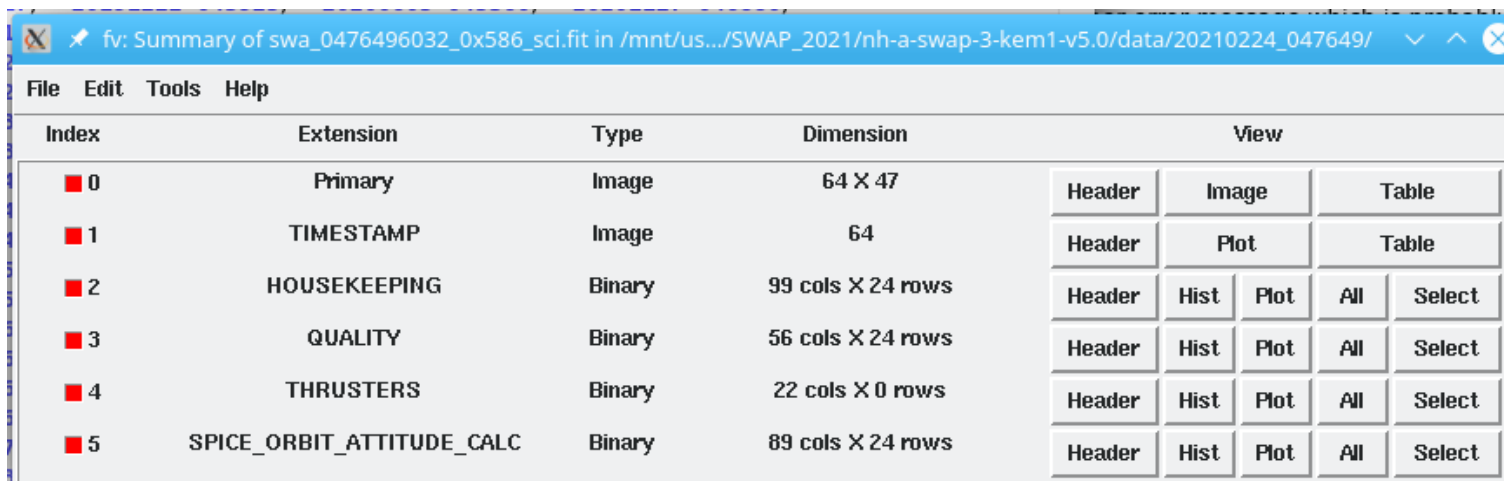
This is the normal fv layout for the Histogram data (0x586) as described in the ICD:



fv: Summary of swa\_0468547232\_0x586\_sci.fit in /mnt/us.../SWAP\_2021/nh-a-swap-3-kem1-v5.0/data/20201124\_046854/

Index	Extension	Type	Dimension	View					
0	Primary	Image	2048	Header	Plot		Table		
1	HISTOGRAM	Image	2048	Header	Plot		Table		
2	HOUSEKEEPING	Binary	99 cols X 24 rows	Header	Hist	Plot	All	Select	
3	QUALITY	Binary	56 cols X 24 rows	Header	Hist	Plot	All	Select	
4	THRUSTERS	Binary	22 cols X 0 rows	Header	Hist	Plot	All	Select	
5	SPICE_ORBIT_ATTITUDE_CALC	Binary	89 cols X 24 rows	Header	Hist	Plot	All	Select	

This is the fv layout of the 7 files from the previous page:



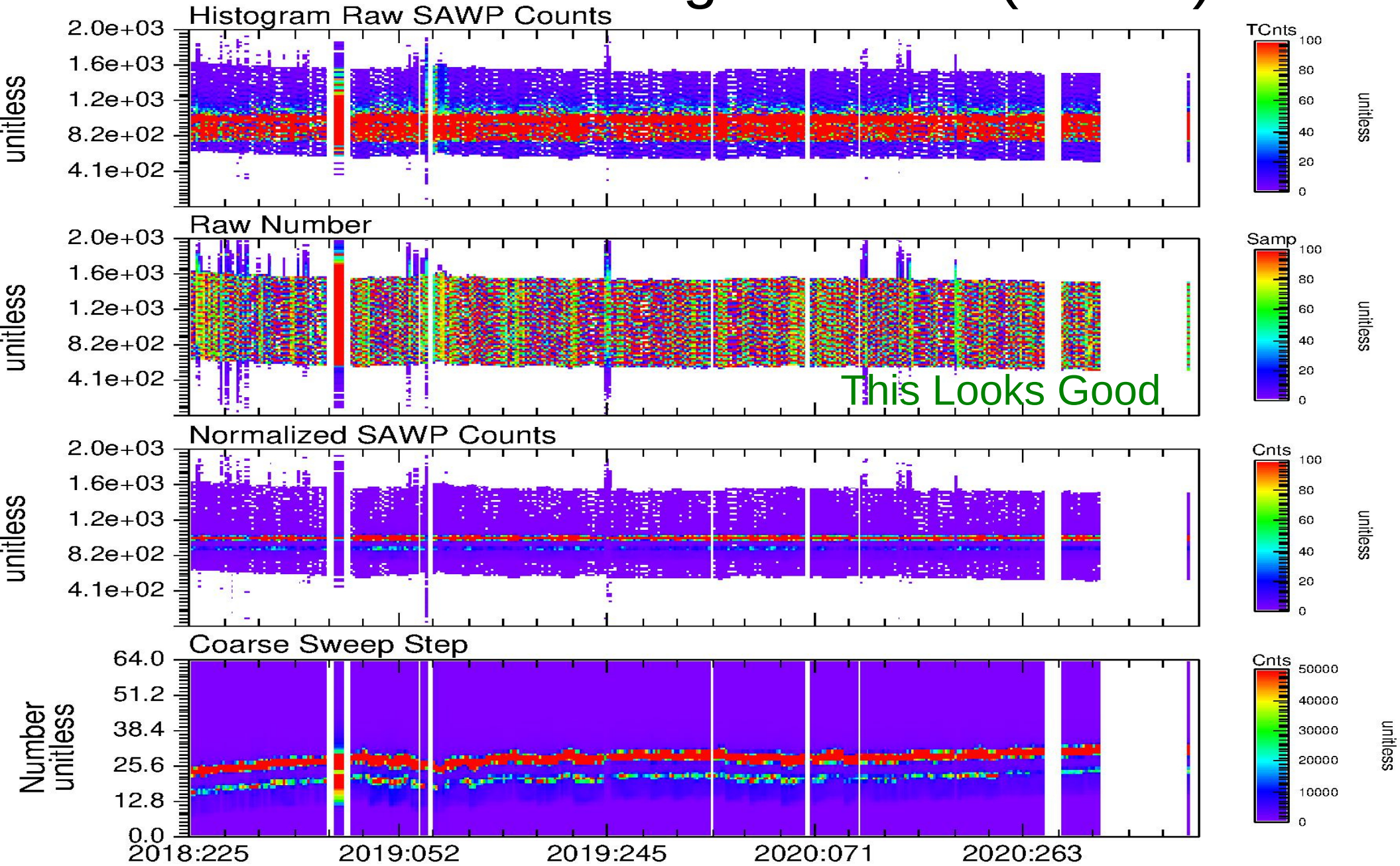
fv: Summary of swa\_0476496032\_0x586\_sci.fit in /mnt/us.../SWAP\_2021/nh-a-swap-3-kem1-v5.0/data/20210224\_047649/

Index	Extension	Type	Dimension	View					
0	Primary	Image	64 X 47	Header	Image		Table		
1	TIMESTAMP	Image	64	Header	Plot		Table		
2	HOUSEKEEPING	Binary	99 cols X 24 rows	Header	Hist	Plot	All	Select	
3	QUALITY	Binary	56 cols X 24 rows	Header	Hist	Plot	All	Select	
4	THRUSTERS	Binary	22 cols X 0 rows	Header	Hist	Plot	All	Select	
5	SPICE_ORBIT_ATTITUDE_CALC	Binary	89 cols X 24 rows	Header	Hist	Plot	All	Select	

# nh-a-swap-3-kem1-v5.0/data

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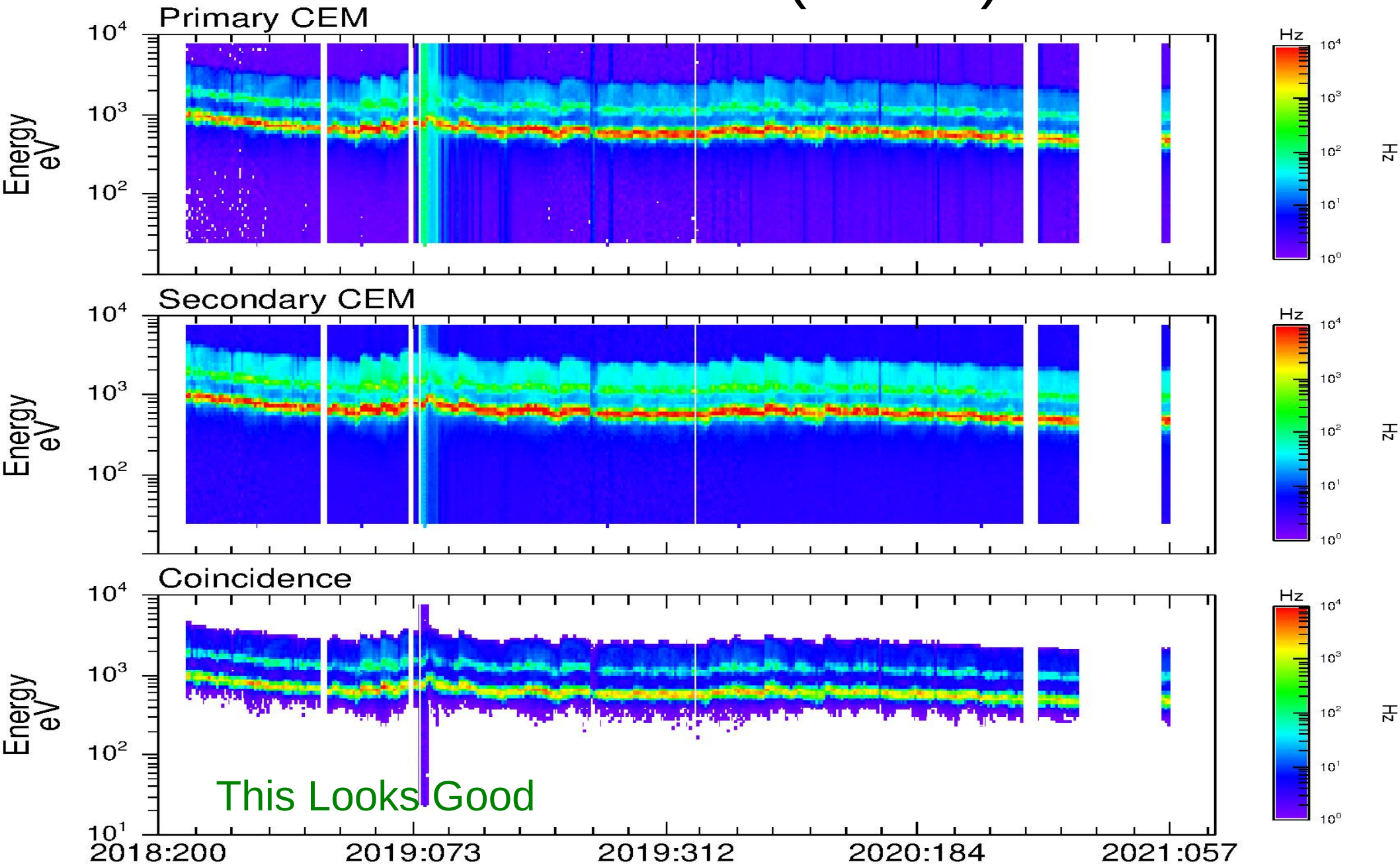
## Remainder of Histogram Data (0x586)





# nh-a-swap-3-kem1-v5.0/data Science Data (0x584)

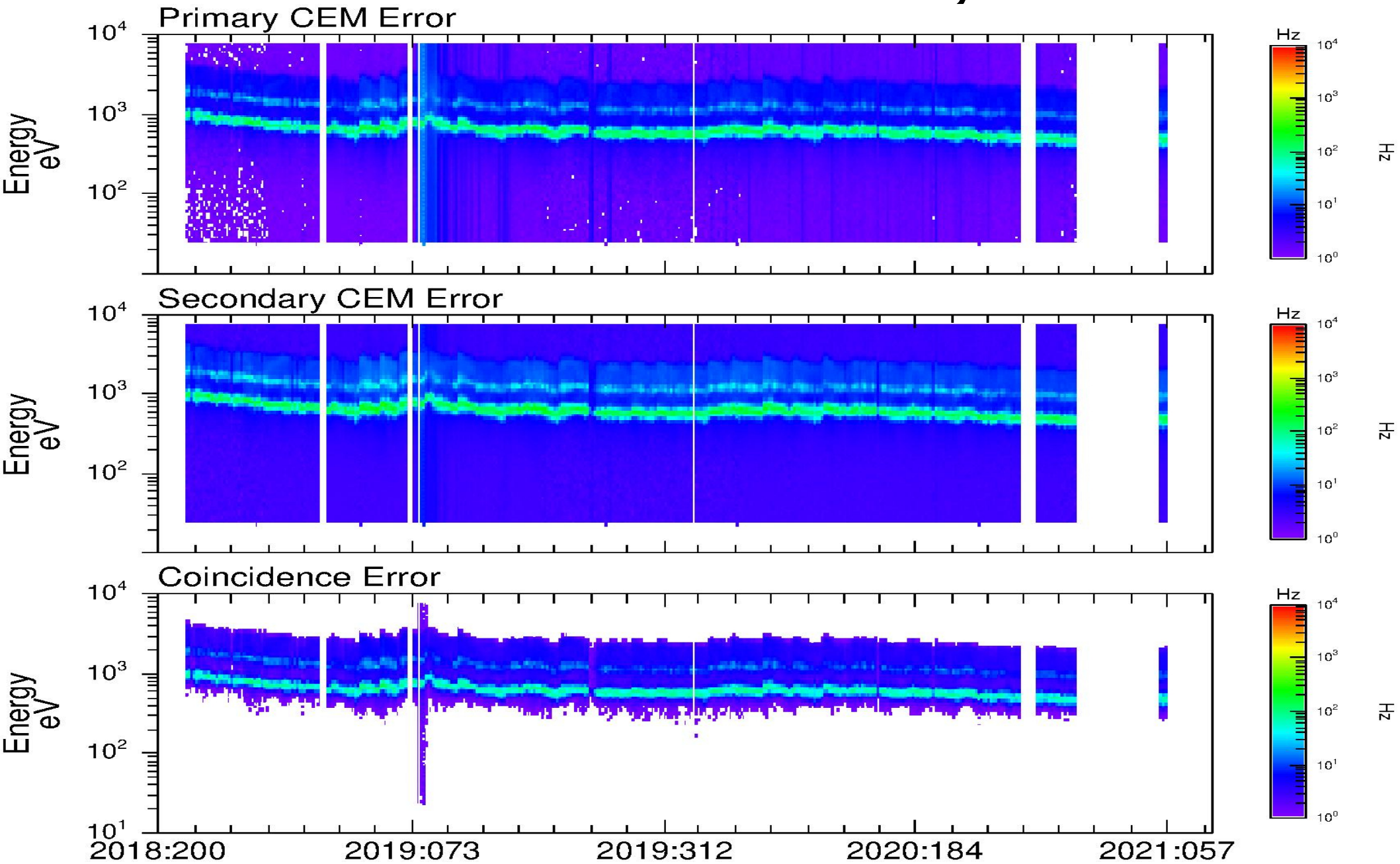
32



# nh-a-swap-3-pluto-v5.0/data

## Relative Uncertainty

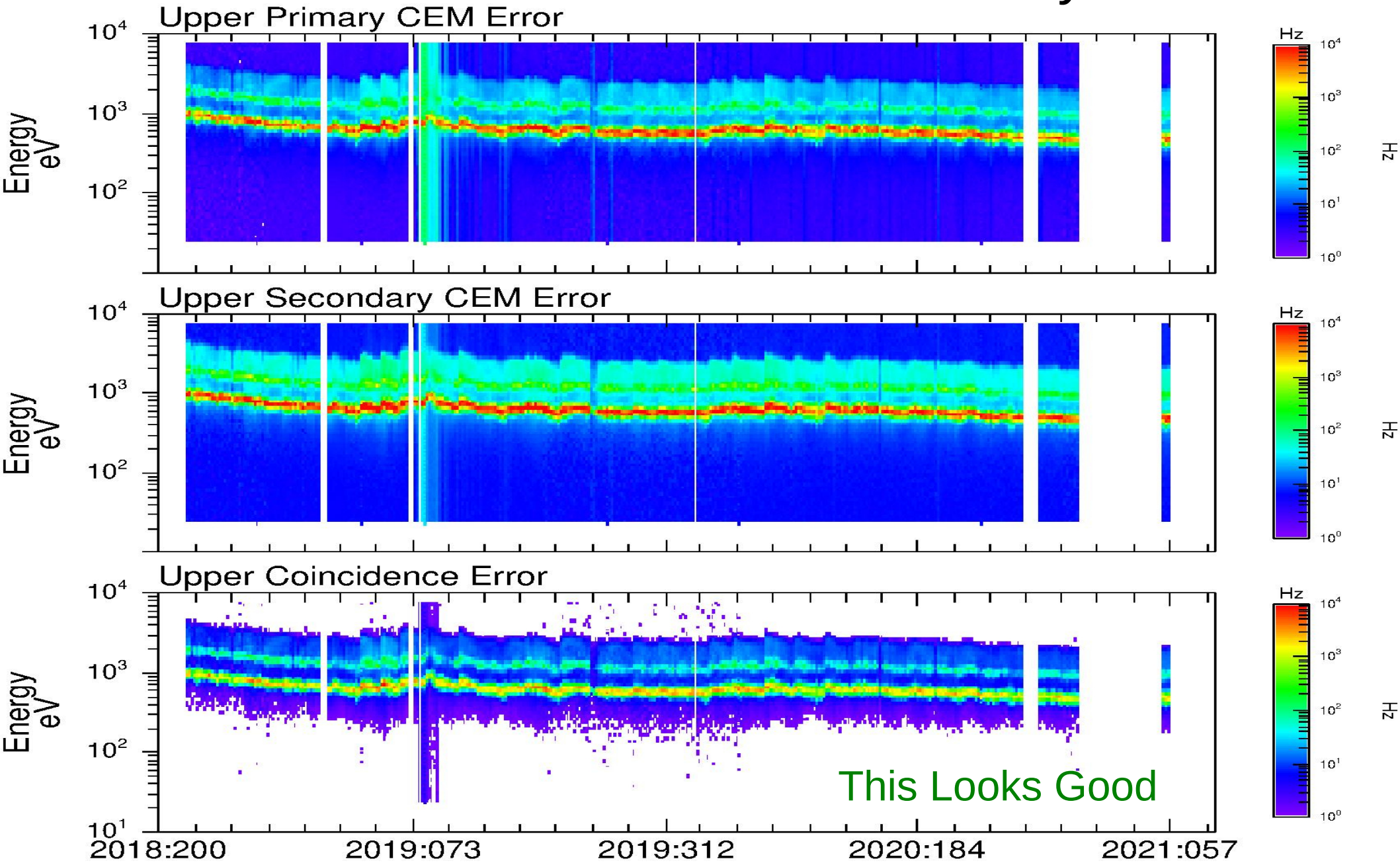
33





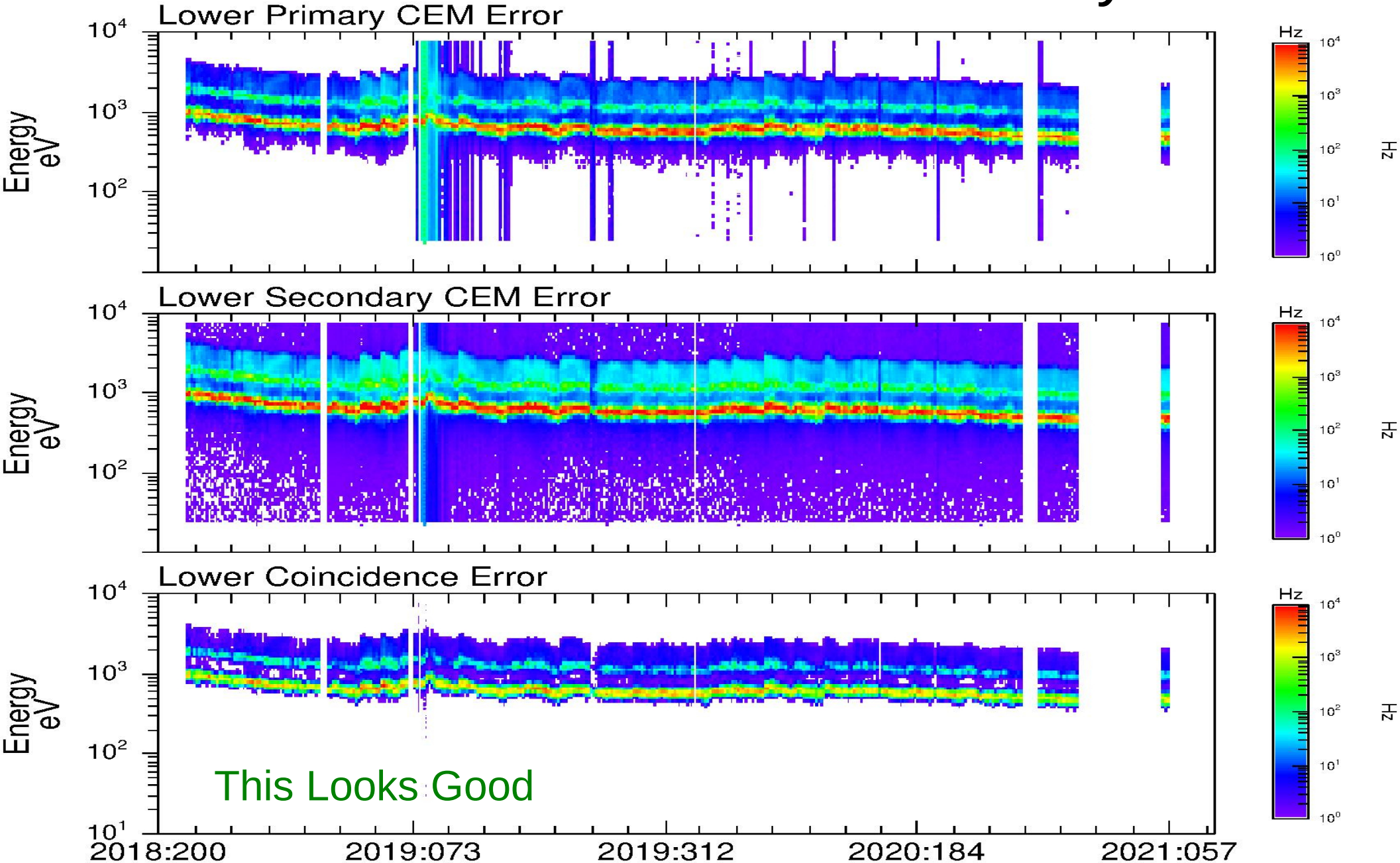
# nh-a-swap-3-kem1-v5.0/data

## Absolute Maximum Uncertainty



# nh-a-swap-3-kem1-v5.0/data

## Absolute Minimum Uncertainty

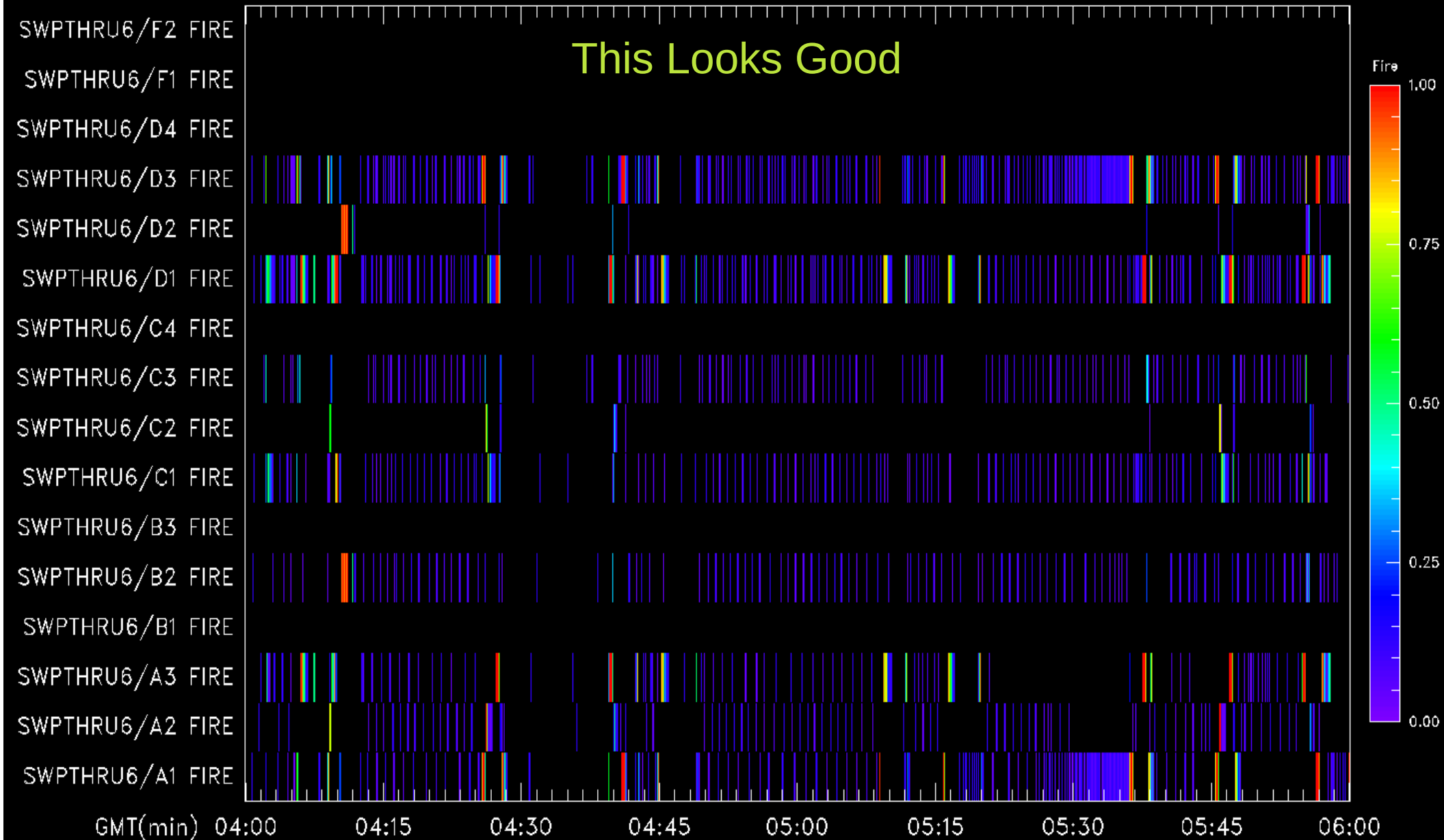


# nh-a-swap-3-kem1-v5.0/data Thruster Firings Near Arrokoth

36

2019/001 04:00:00.000

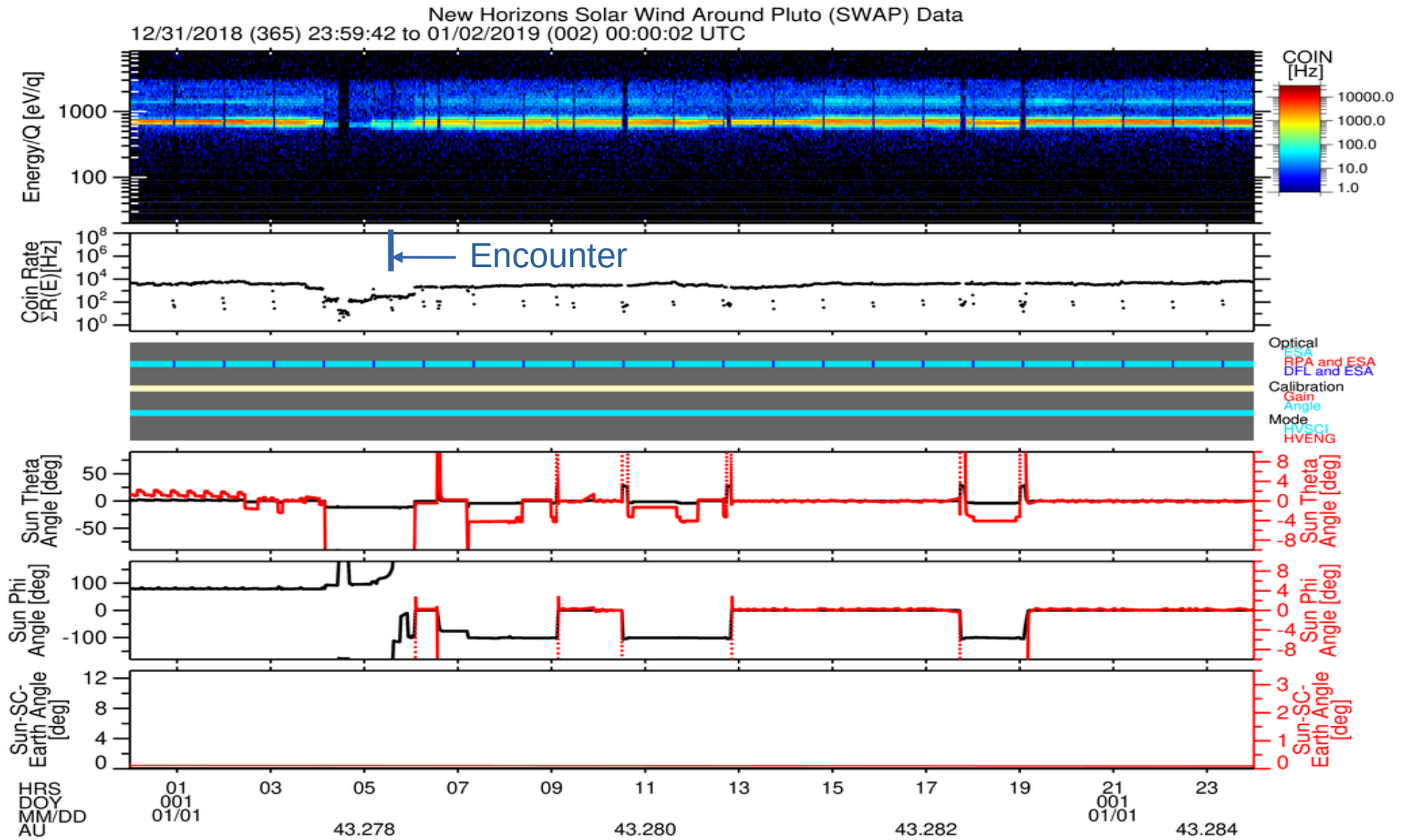
This Looks Good



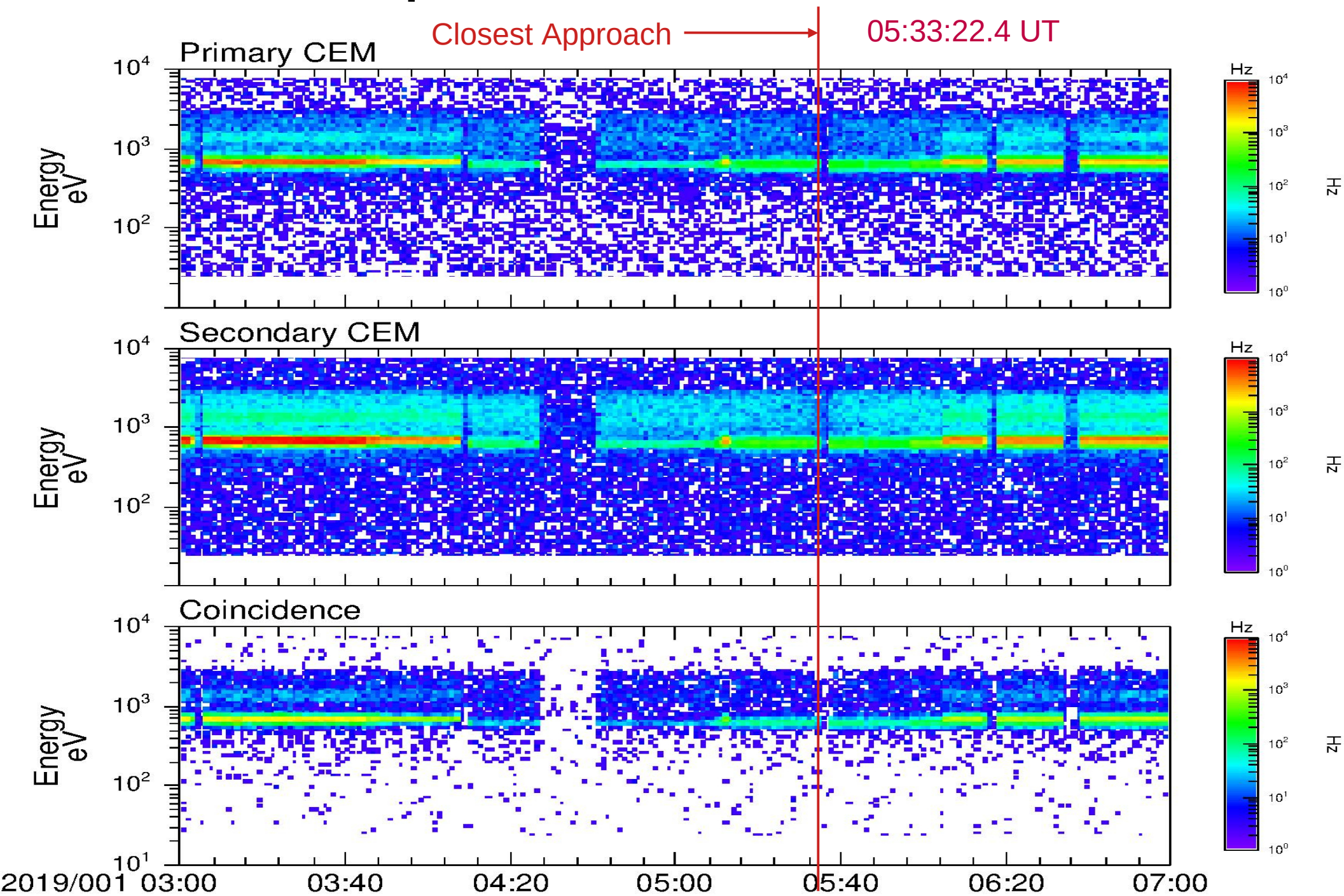


# swap\_001day\_201812312359.png

## Arrokoth Encounter



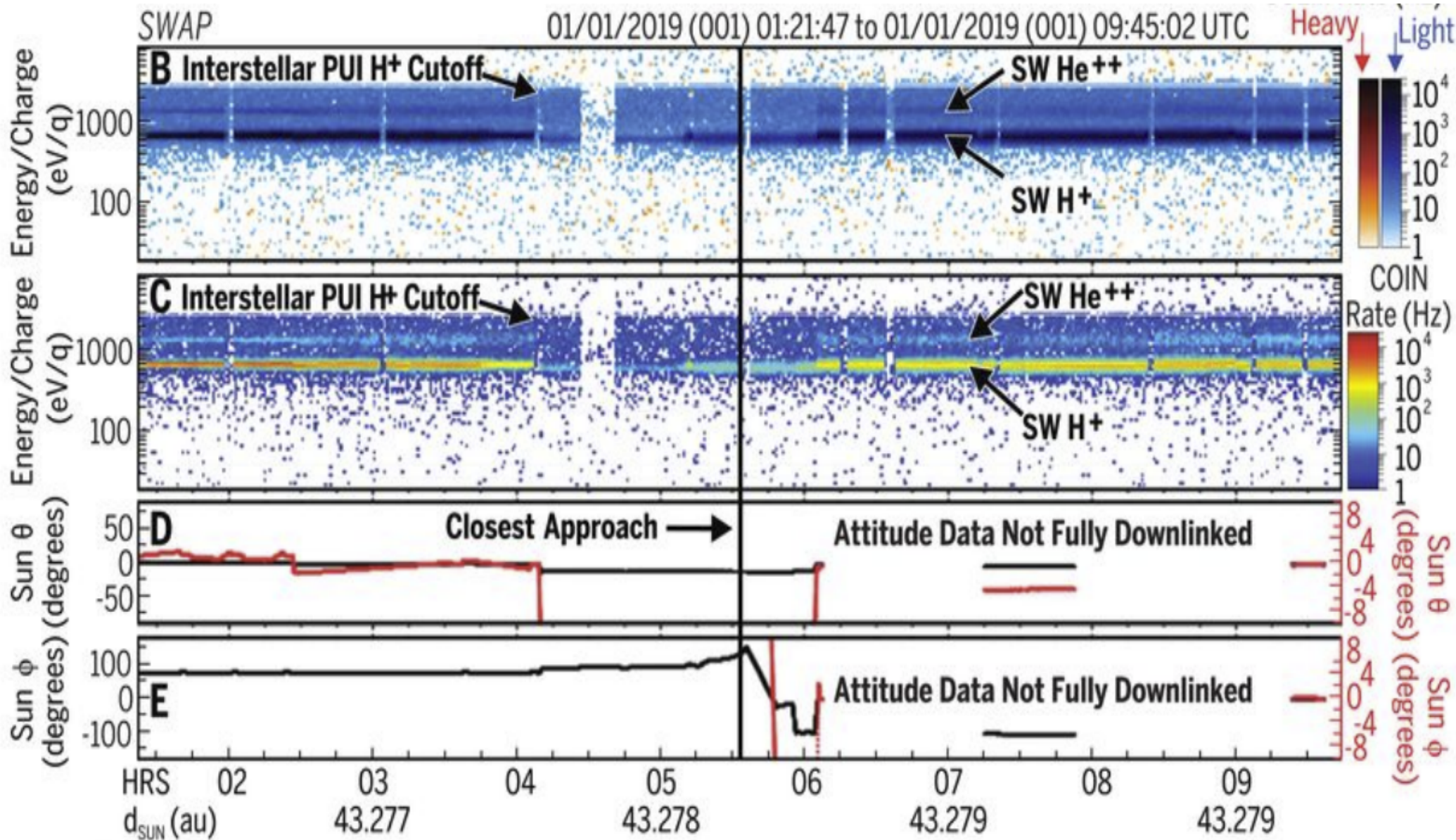
# Close-up of Arrokoth Encounter





Stern, S. A., et al., Initial results from the New Horizons exploration of 2014 MU69, a small Kuiper Belt object, Science 364, 2019.  
DOI: 10.1126/science.aaw9771

Closest Approach



# Certification for nh-a-swap-2-kem1-v5.0 and nh-a-swap-3-kem1-v5.0

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There are some minor documentation errors which need to be corrected before certification could be granted; however, the SWAP data for ApID 0x586 pose a more serious issue which require certification be withheld. The documentation describing the format for the last 7 data files is in conflict with the ICD and there is no indication of a format change.

# Certification Remedies for nh-a-swap-2-kem1-v5.0 and nh-a-swap-3-kem1-v5.0

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- 1) Update the ICD (and possibly swap.cat file) to describe the data format and relative information for ApID 0x586. Resubmit the archive and conduct a new data review, OR
- 2) Withdraw ApID 0x586 data, correct the documentation, and certify the data which remains. Then correct the documentation describing 0x586 data and conduct a new data review on ApID 0x586 data, OR
- 3) Remove the offending data files, fix the documentation issues, and then this generates a certifiable data set. The offending ApID 0x586 data files can be submitted with a new data set at a later date when the ICD and/or other documentation is updated.

# **SWAP DERIVED Documentation Evaluation**

# nh-x-swap-5-derived-solarwind-v2.0 catalog/nhkem.cat

Can this be Updated?

```
OBJECT          = MISSION
MISSION_NAME    = "NEW HORIZONS KUIPER BELT EXTENDED MISSION"

OBJECT          = MISSION_INFORMATION
MISSION_START_DATE = 2016-10-26
MISSION_STOP_DATE  = 2021-09-30
MISSION_ALIAS_NAME = "NH_KEM"
MISSION_DESC      = ""
```

This material has been adapted from the New Horizons web site. The mission stop date is the current stop date of the Kuiper Belt (KB) Extended Mission (KEM).  
The MISSION\_STOP\_DATE is the current contracted mission stop date. If approved KEM1's phase may exceed this date and therefore the end is TBD.

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.



# nh-x-swap-5-derived-solarwind-v2.0 catalog/swap.cat – 1 of 2

44

In the Level 3 Directory Tree (not in Level 5 data)

```
Calibration
=====

See

  /DOCUMENT/SWAP_CAL.*

and Section 4 of McComas et al. (2008) [MCCOMASETAL2008], also available as a
preprint at this URL:

  http://www.boulder.swri.edu/pkb/ssr/ssr-swap.pdf

as of 20.April, 2007.
```

Update? It works in 2022!!

# nh-x-swap-5-derived-solarwind-v2.0 catalog/swap.cat – 2 of 2

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## This Section Describes Data in the Level 3 Directory Tree (not in Level 5 data)

### Note on Reading the Data and Extensions

=====

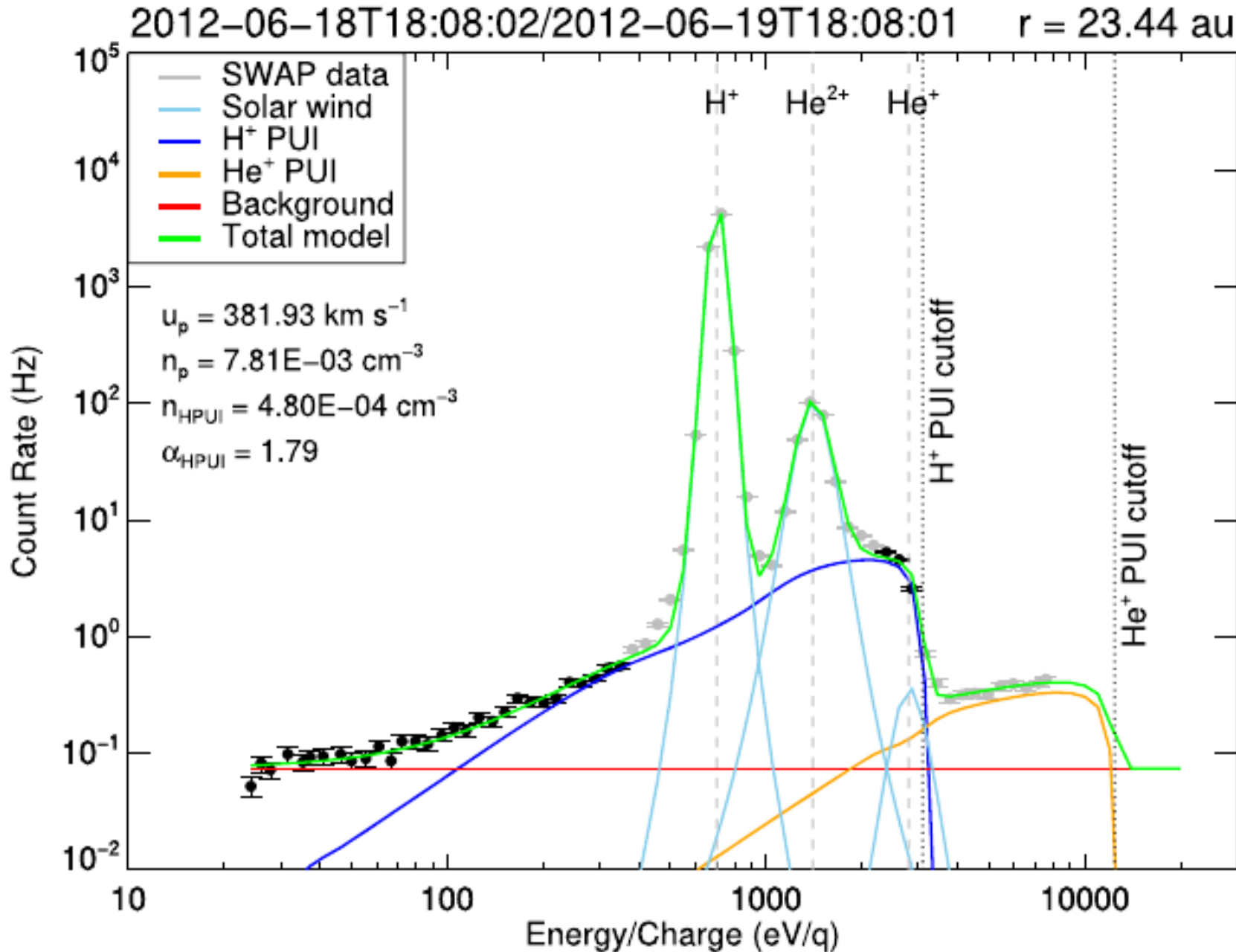
Summary plots cover ranges from 1 day to 1 year of data. Some of the summary plots do not contain any data, or such a limited amount that it is hard to see. The main purpose of the summary plots is to get a quick look at the data available, so it is normal when some of these plots appear to be blank.

For the histogram data (0x586) extension zero is an array of 2048 values containing the number of samples in the normalized histograms. Extension 1 holds the total count rates in bins normalized according to the peak location found in the fine scans. Starting in 2008, the histogram data files were changed such that the last 64 bins of extension 1 contain the total count rates for each of the coarse scan energy steps. In extension 0 the number of samples for these last 64 elements is zero. The other bins remain as they were prior to this change. To obtain the number of samples in the totals for the last 64 bins you need to use the parameter SMPLCNT in the primary header (header for extension 0).

# **SWAP DERIVED Data Evaluation**

# Example Spectrum

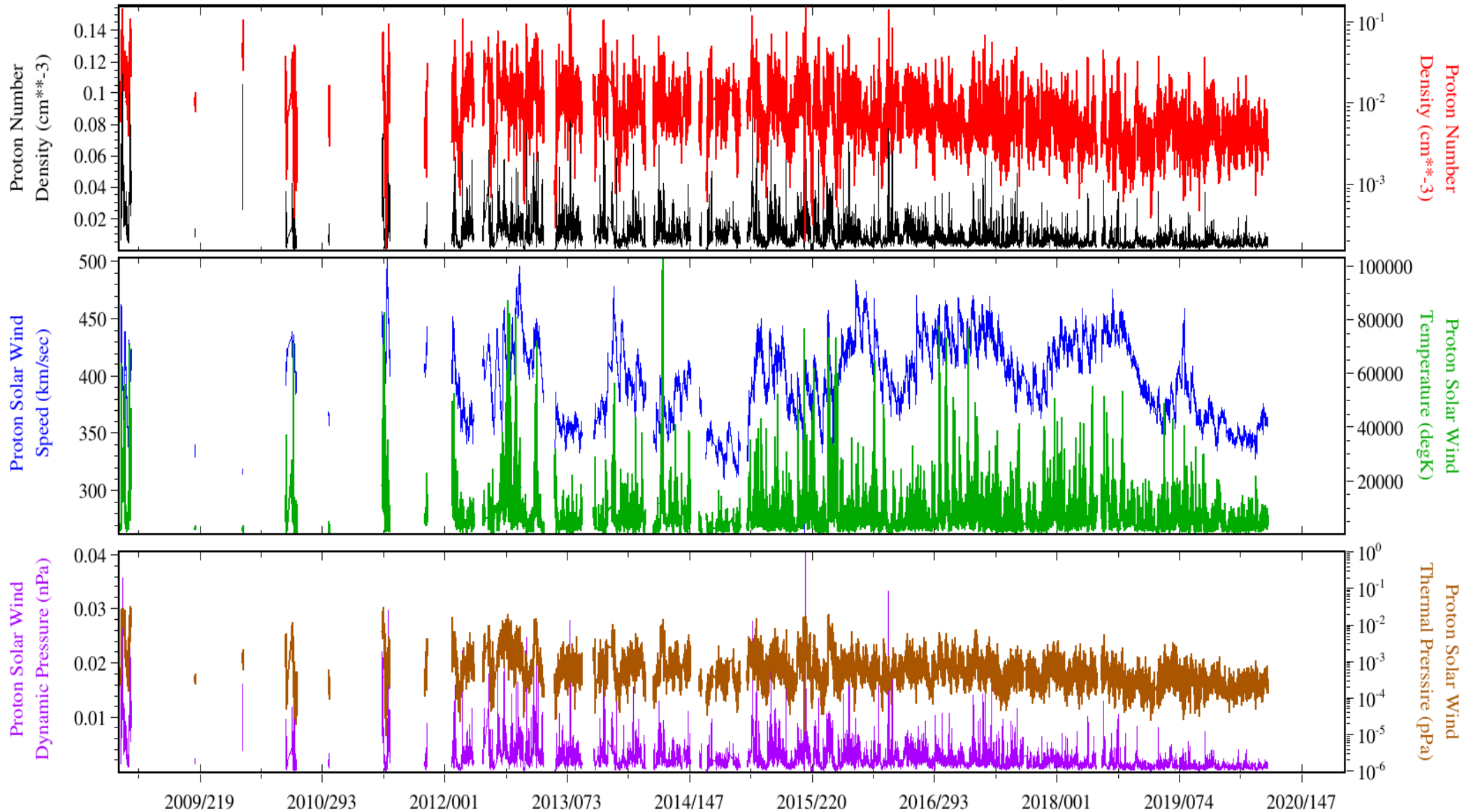
Swaczyna et al., *Astrophysical Journal*, 2020.



# nh-x-swap-5-derived-solarwind-v2.0

## data/nh\_sw\_20081010\_20200127.csv

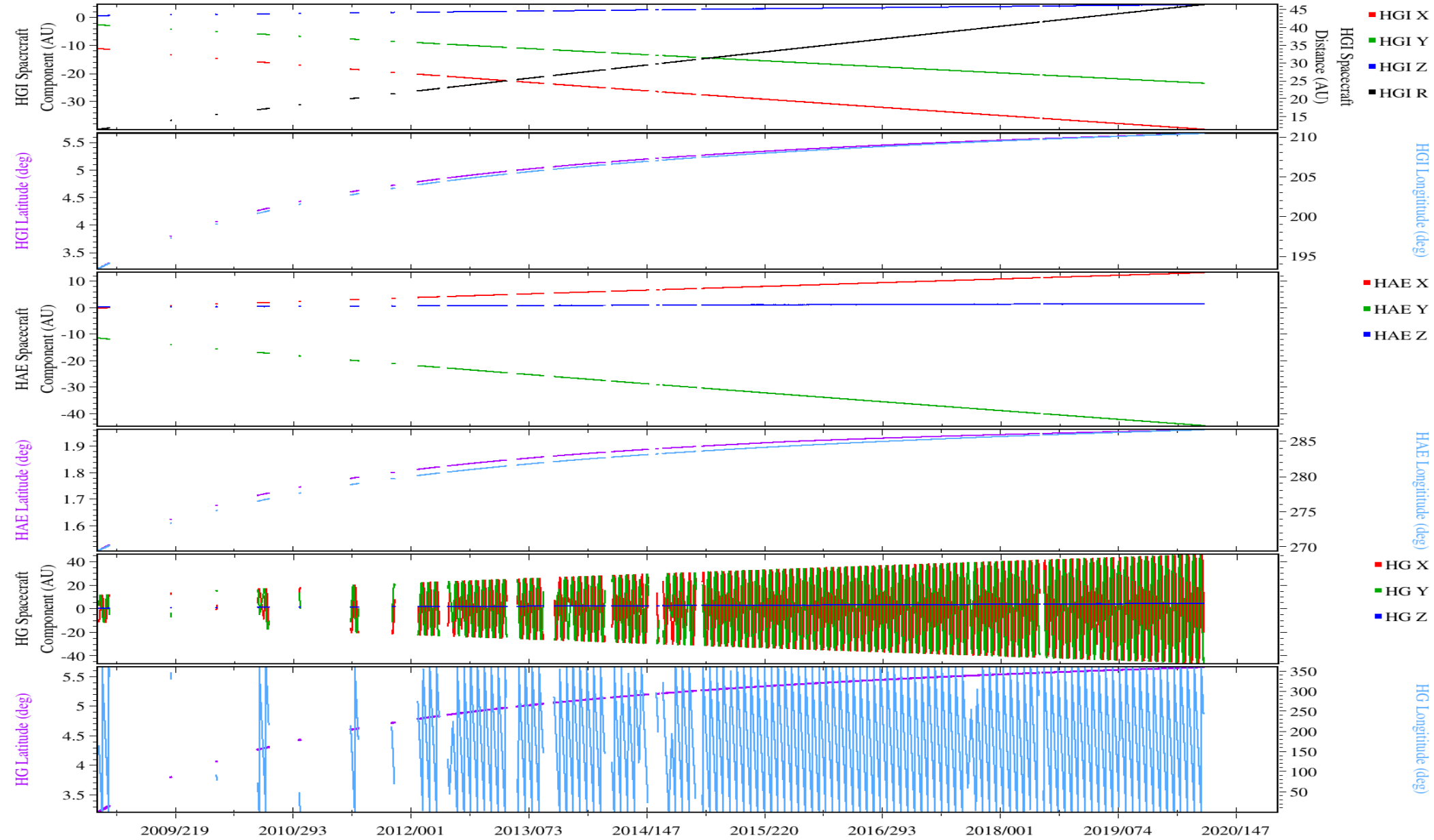
New Horizons SWAP Solar Wind Proton Plasma



# nh-x-swap-5-derived-solarwind-v2.0

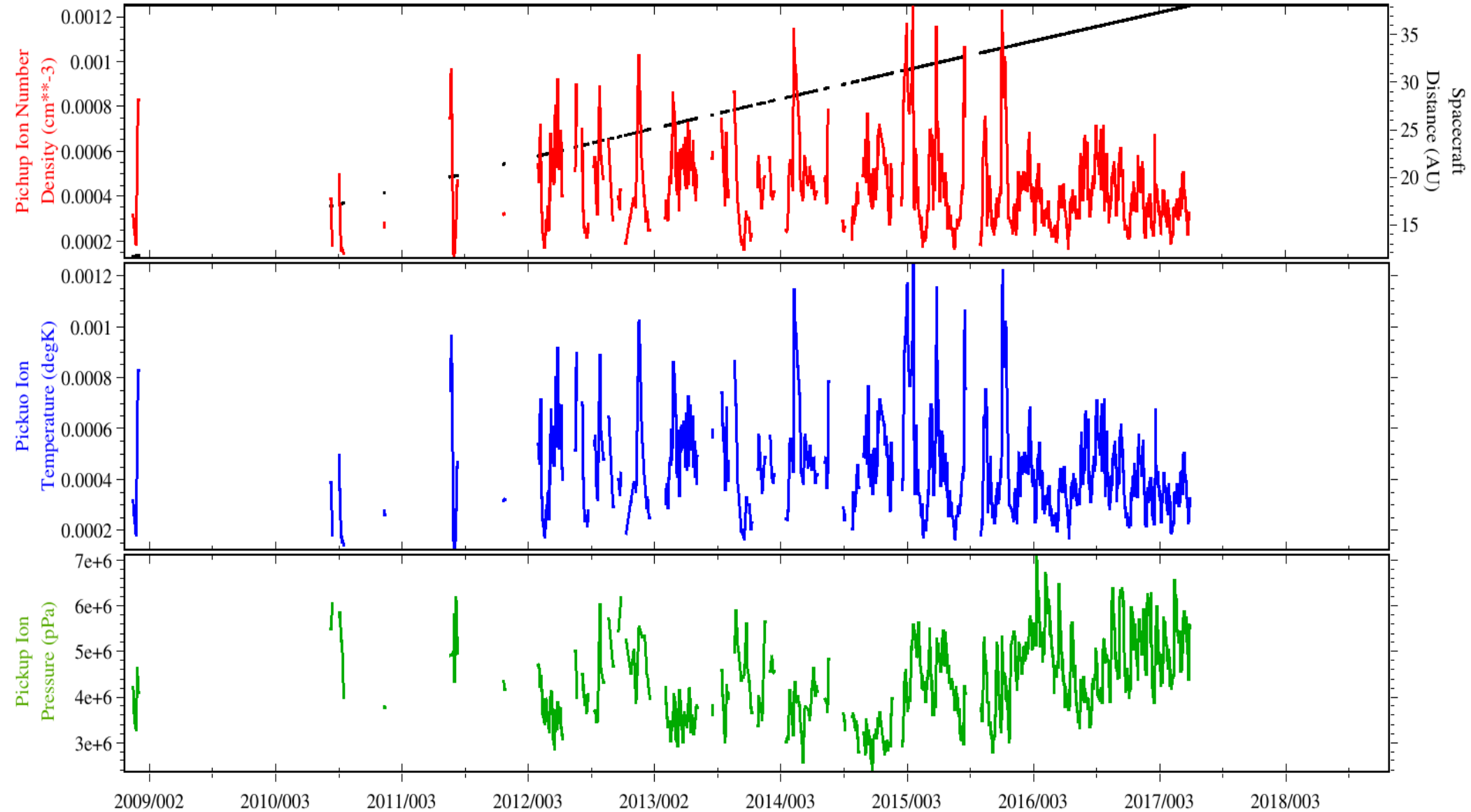
## data/nh\_sw\_20081010\_20200127.csv

Position of New Horizons



# nh-x-swap-5-derived-solarwind-v2.0 data/nh\_pickupions\_2008\_11\_16.csv

New Horizons SWAP Interstellar Pickup Ions



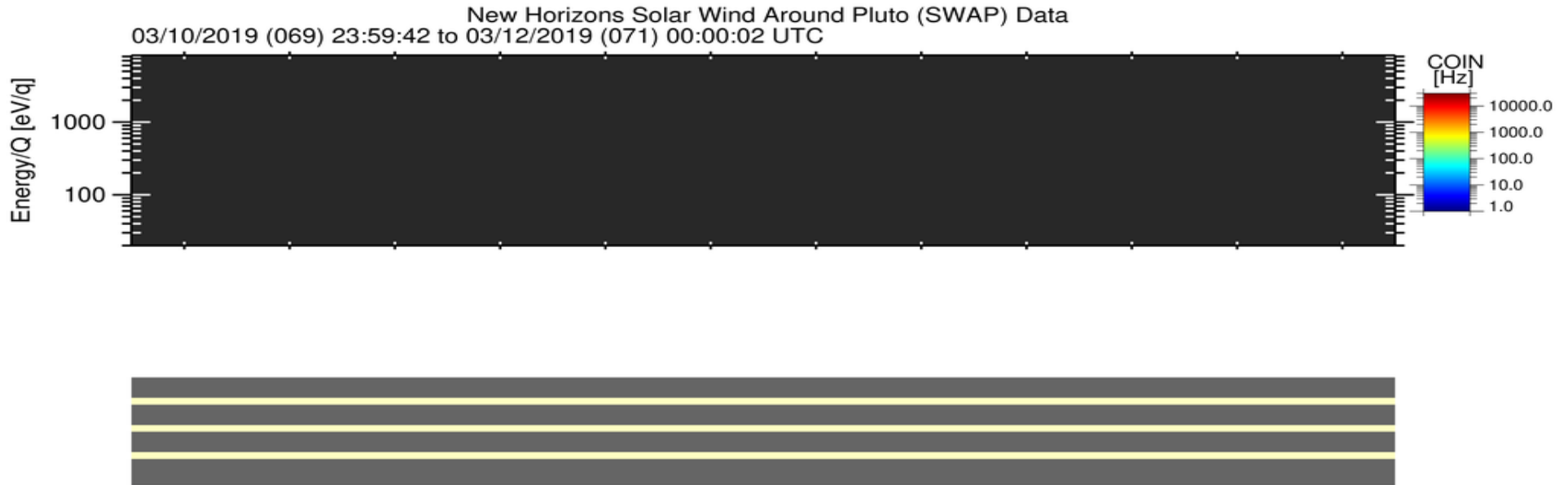


# Certification for nh-x-swap-5-derived-solarwind-v2.0

These SWAP Level 5 data from  
nh-x-swap-5-derived-solarwind-v2.0  
are certifiable once documentation  
corrections have been made.

**BACK-UP SLIDES**

# nh-a-swap-2-kem1-v3.0/document nh-a-swap-3-kem1-v3.0/document data\_summary\_plots/swap\_001day\_201903102359.png



I still do not like having plots like this in the archive. This looks like the plotting package software failed where you really want to convey that there is no data for the time frame covered by the plot. Empty plot frames with the words “no data” are much better because you see right away that the reason for the empty frame is that there was no data to plot and it was not due to a failure in the plotting software.

HRS  
DOY  
MM/DD  
AU

nh-a-swap-2-kem1-v5.0  
nh-a-swap-3-kem1-v5.0  
aareadme.txt

GOOD

nh-a-swap-2-kem1-v5.0  
nh-a-swap-3-kem1-v5.0  
voldesc.cat

GOOD

nh-a-swap-2-kem1-v5.0/catalog  
nh-a-swap-3-kem1-v5.0/catalog  
catinfo.txt

GOOD

nh-a-swap-2-kem1-v5.0/catalog  
nh-a-swap-3-kem1-v5.0/catalog  
dataset.cat

GOOD



nh-a-swap-2-kem1-v5.0/catalog  
nh-a-swap-3-kem1-v5.0/catalog  
nh\_kem.cat

GOOD

nh-a-swap-2-kem1-v5.0/catalog  
nh-a-swap-3-kem1-v5.0/catalog  
nhsc.cat

GOOD

nh-a-swap-2-kem1-v5.0/catalog  
nh-a-swap-3-kem1-v5.0/catalog  
ref.cat

GOOD

nh-a-swap-2-kem1-v5.0/catalog  
nh-a-swap-3-kem1-v5.0/catalog  
swap.cat

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
docinfo.txt

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
codmac\_level\_definitions.lbl  
codmac\_level\_definitions.pdf

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
lunineetal1995.lbl & lunineetal1995.pdf

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
nh\_fov.lbl & nh\_fov.png

GOOD



nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
nh\_met2utc.tbl & nh\_met2utc.tab

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
nh\_mission\_trajectory.tbl

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
nh\_swap\_v200\_ti.txt

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
payload\_ssr.lbl & payload\_ssr.pdf

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
quat\_axyz\_instr\_to\_j2k.lbl  
quat\_axyz\_instr\_to\_j2k.asc

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
seq\_swap\_kem1.lbl & seq\_swap\_kem1.tab

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
swap\_ssr.lbl & swap\_ssr.pdf

GOOD



nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
swap\_cal.tbl

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
soc\_inst\_icd.lbl

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
traj/trajinfo.txt

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
traj/traj.fmt

GOOD

nh-a-swap-2-kem1-v5.0/document  
nh-a-swap-3-kem1-v5.0/document  
traj/traj\_2006\_2027\_1d.tbl

GOOD

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
calinfo.txt

GOOD

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
rpa\_shape.lbl

GOOD

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
esa\_shape.lbl

GOOD



nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
fov\_mask\_2d.lbl

GOOD

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
background\_009\_dac.lbl

GOOD

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
background\_009\_dac\_jup.lbl

GOOD

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
list\_energy\_files.lbl & list\_energy\_files.tab

GOOD

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
esa\_rpa\_v16\_energy\_binsf\_new.lbl

GOOD

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
esa\_rpa\_v16\_energy\_binsf\_new.lbl

GOOD

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
esa\_rpa\_v18\_energy\_binsf\_new.lbl

GOOD

nh-a-swap-2-kem1-v5.0/calib  
nh-a-swap-3-kem1-v5.0/calib  
esa\_rpa\_v19\_energy\_binsf\_new2.lbl

GOOD



nh-a-swap-2-kem1-v5.0/index  
nh-a-swap-3-kem1-v5.0/index  
indxinfo.txt

GOOD

nh-a-swap-2-kem1-v5.0/index  
nh-a-swap-3-kem1-v5.0/index  
index.lbl & index.tab

GOOD

nh-a-swap-2-kem1-v5.0/index  
nh-a-swap-3-kem1-v5.0/index  
slimindx.tbl & slimindx.tab

GOOD

nh-a-swap-2-kem1-v5.0/index  
nh-a-swap-3-kem1-v5.0/index  
checksum.tbl & checksum.tab

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
aareadme.txt

Minor Correction Sent to PDS

nh-x-swap-5-derived-solarwind-v2.0  
voldesc.cat

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
index/indxinfo.txt

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
index/index.tbl

GOOD



nh-x-swap-5-derived-solarwind-v2.0  
index/index.tab

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
index/checksum.lbl

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
index/checksum.tab

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
document/docinfo.txt

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
document/error\_notes.txt

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
catalog/catinfo.txt

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
catalog/dataset.cat

Minor Corrections Send to PDS

nh-x-swap-5-derived-solarwind-v2.0  
catalog/nh.cat

Minor Correction Send to PDS



nh-x-swap-5-derived-solarwind-v2.0  
catalog/nhsc.cat

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
catalog/ref.cat

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
data/nh\_sw\_20081010\_20200127.tbl

GOOD

nh-x-swap-5-derived-solarwind-v2.0  
data/nh\_pickupions\_2008\_11\_16.tbl

GOOD