

Solar Wind Around Pluto

SWAP

PRINCIPAL INVESTIGATOR
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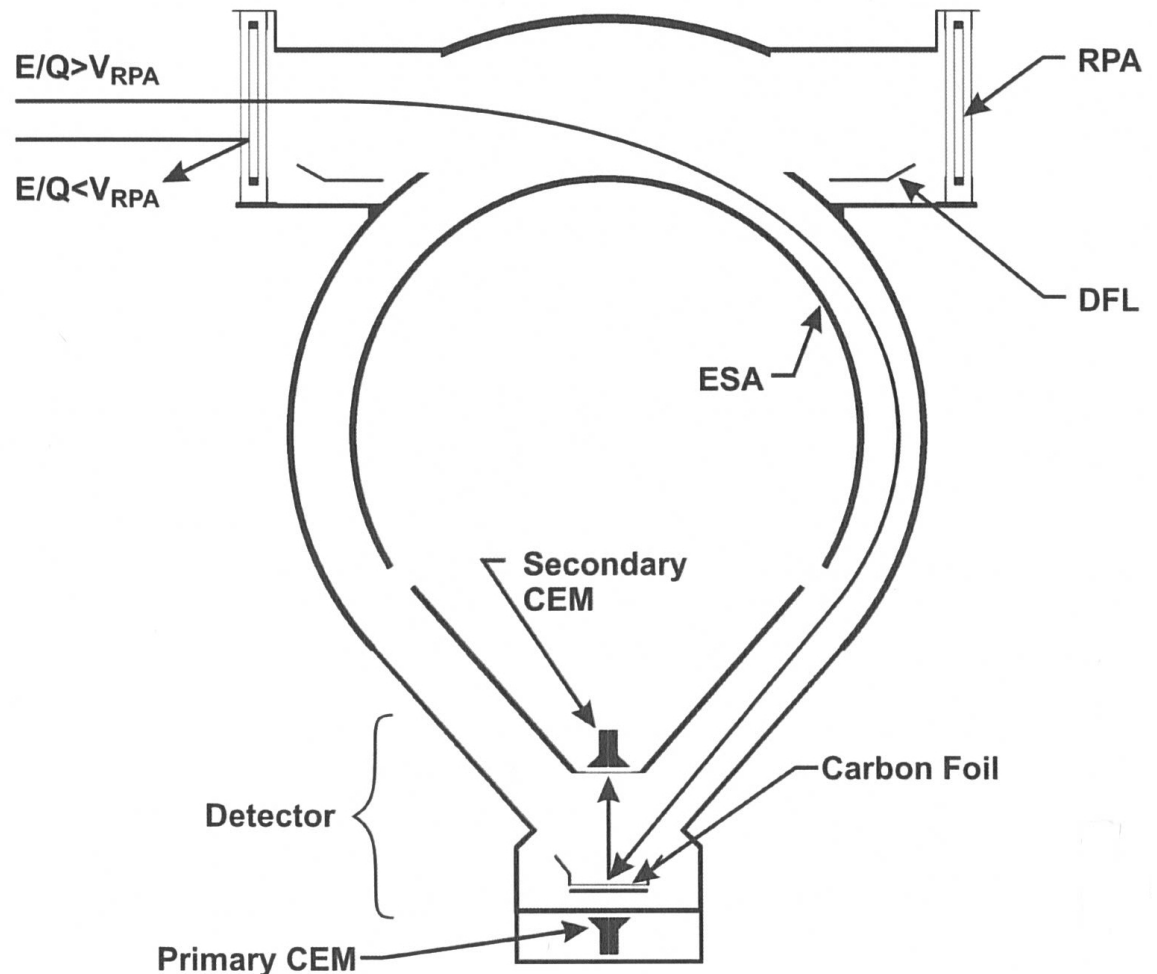
DESCRIPTION
Low Energy Plasma Instrument

ENERGY RANGE
30 eV - 7.7 keV

FIELD OF VIEW
 $270^\circ \times 10^\circ$
(deflection angles up to $+15^\circ$)

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

SPECIES
All Ions



New Horizons SWAP Collections

- 1) Mission Documents v3.0
PDS4 ID: urn:nasa:pds:nh_documents:mission::3.0
- 2) Spacecraft Trajectory
PDS4 ID: urn:nasa:pds:nh_swap:trajectory::2.0
- 3) Documents for the SWAP Instrument v2.0
PDS4 ID: urn:nasa:pds:nh_documents:swap::2.0
- 4) SWAP KEM1 Encounter Raw Data v2.0
PDS4 ID: urn:nasa:pds:nh_swap:kem1_raw::2.0
- 5) SWAP KEM2 Encounter Raw Data v1.0
PDS4 ID: urn:nasa:pds:nh_swap:kem2_raw::1.0
- 6) SWAP Reference Files Used in Calibrating Data v2.0
PDS4 ID: urn:nasa:pds:nh_swap:calibration_files::2.0
- 7) SWAP KEM1 Encounter Calibrated Data v2.0
PDS4 ID: urn:nasa:pds:nh_swap:kem1_cal::2.0
- 8) SWAP KEM2 Encounter Calibrated Data v1.0
PDS4 ID: urn:nasa:pds:nh_swap:kem2_cal::1.0

New Horizons SWAP Data Set Evaluation Tools

3

Machine: Dell Precision Tower 5810
Operating System: Rocky-8 linux

1) Mission Documents v3.0

2) Spacecraft Trajectory

collection.lblx – 1 or 2

Error Message from Browser:

This XML file does not appear to have any style information associated with it.

```
<Discipline_Area>
```

```
<!--
```

```
Errors appear to be because nh:Operation_Parameters is not present (change requested).  
can only have one phase (change requested) while this file covers the full mission  
In nh:mision_phase_name, SBN has been using the "Full MISSION_PHASE_NAME" from  
https://pdssbn.astro.umd.edu/holdings/pds4-nh\_documents:mission-v2.0/documents/nhkem1\_mission\_overview.pdf  
Also schema only allows KEM1 Cruise, KEM1 Encounter, and KEM2 Cruise
```

```
-->
```

```
<!--
```

```
When NH dictionary is updated, this can be uncommented, checked, and updated - also  
UPDATE dictionary info at beginning of file
```

```
<nh:Mission_Parameters>
```

```
<nh:mision_phase_name>Post-Launch Checkout</nh:mision_phase_name>
```

```
<nh:mision_phase_name>Jupiter Encounter</nh:mision_phase_name>
```

```
<nh:mision_phase_name>Pluto Cruise</nh:mision_phase_name>
```

```
<nh:mision_phase_name>Pluto Encounter</nh:mision_phase_name>
```

```
<nh:mision_phase_name>Cruise to First KBO Encounter</nh:mision_phase_name>
```

```
<nh:mision_phase_name>KEM1 Encounter</nh:mision_phase_name>
```

```
</nh:Mission_Parameters>
```

```
-->
```

```
</Discipline_Area>
```

collection.lblx – 2 or 2

Error Message from NASA PDS Validate v3.6.3:

Product Level Validation Results

FAIL: file:collection.lblx

ERROR [error.label.schema] line 23, 18: cvc-pattern-valid: Value '[TBD]' is not facet-valid with respect to pattern '10\\.S+\\S+' for type 'doi'.

ERROR [error.label.schema] line 23, 18: cvc-type.3.1.3: The value '[TBD]' of element 'doi' is not valid.

ERROR [error.label.missing_file] URI reference does not exist: file:inventory.csv

WARNING [warning.label.context_ref_mismatch] line 106: Context reference type mismatch. Value: 'Equipment' Expected one of: '[Spacecraft]'

ERROR [error.validation.internal_error] Uncaught exception while validating: inventory.csv (No such file or directory)

1 product validation(s) completed

trajinfo.txt

This looks like a PDS3 file. The information included in this file shows the directory structure and its contents. PDS4 does not require this information. This file should not be included in a PDS4 archive.

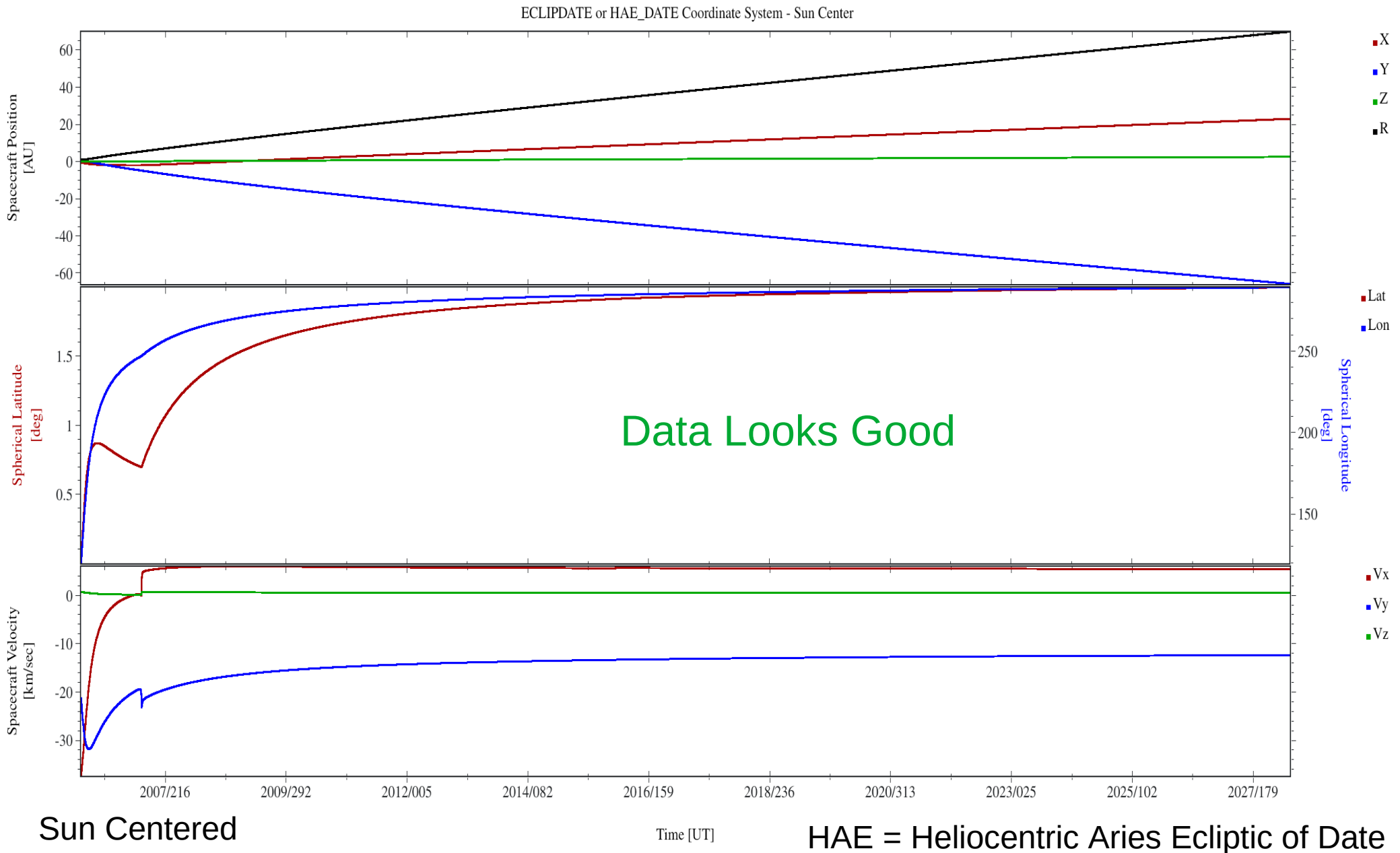
traj.fmt

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_hae_date.lbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_hae_date.tab



traj_hae_date.xml

NASA PDS Validate v3.6.3: PASS

traj_hae_j2000.lbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_hae_j2000.tab

ECLIPJ2000 or HAE_J2000 Coordinate System - Sun Center



Sun Centered

Time [UT]

HAE = Heliocentric Aries Ecliptic of J2000

traj_hae_j2000.xml

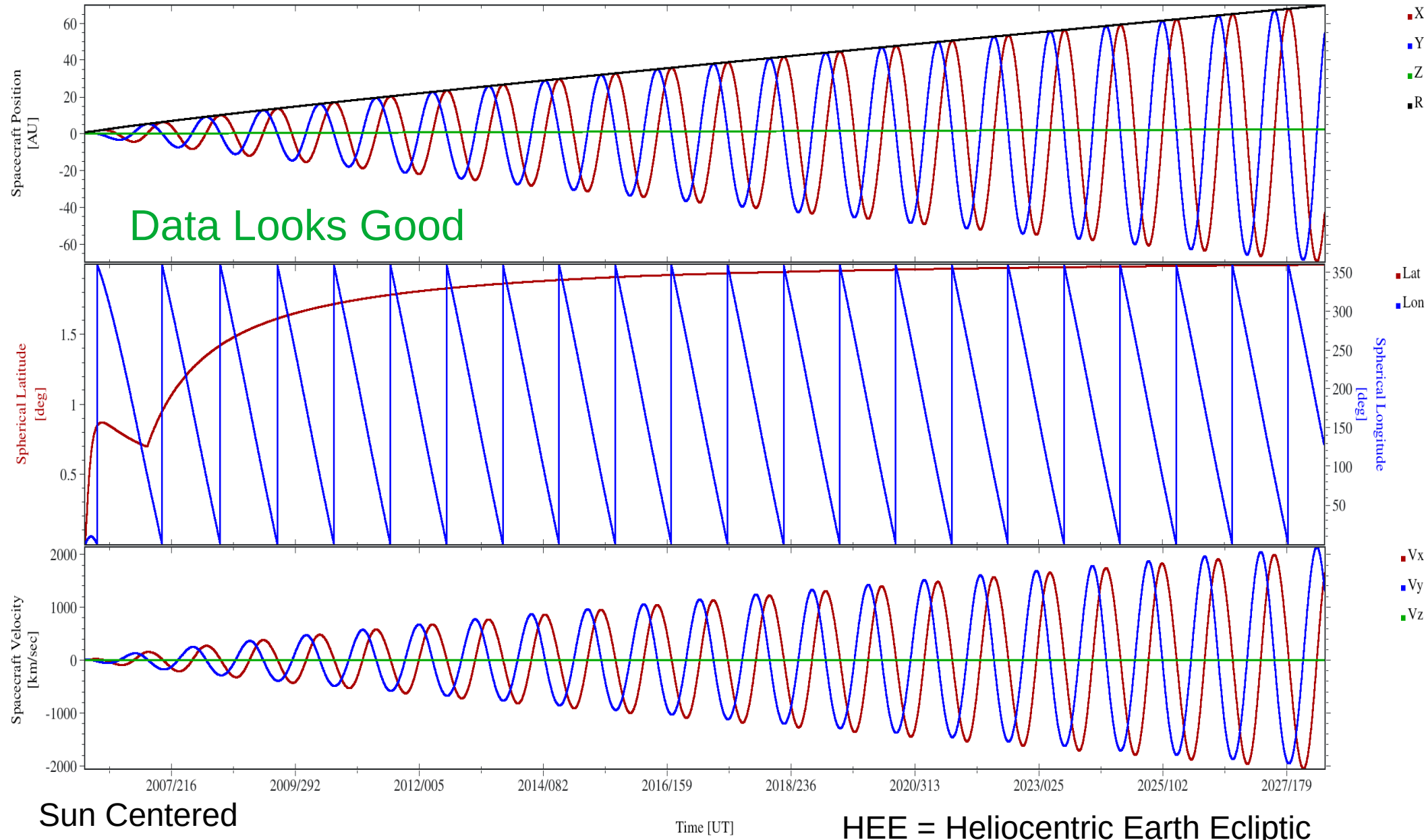
NASA PDS Validate v3.6.3: PASS

traj_hee.lbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_hee.tab

HEE Coordinate System - Sun Center



traj_hee.xml

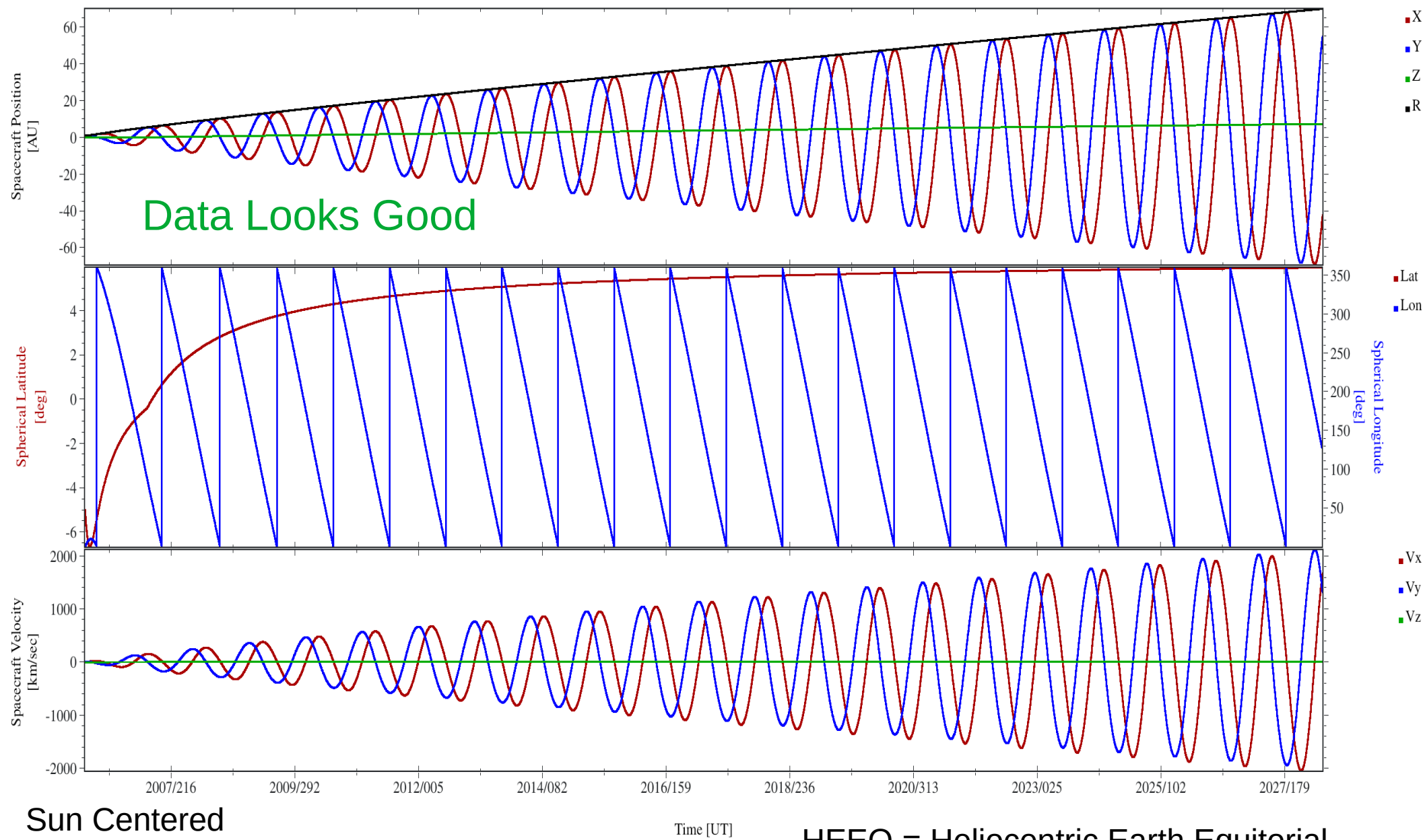
NASA PDS Validate v3.6.3: PASS

traj_heelq.lbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_heeq.tab

HEEQ Coordinate System - Sun Center



traj_heeq.xml

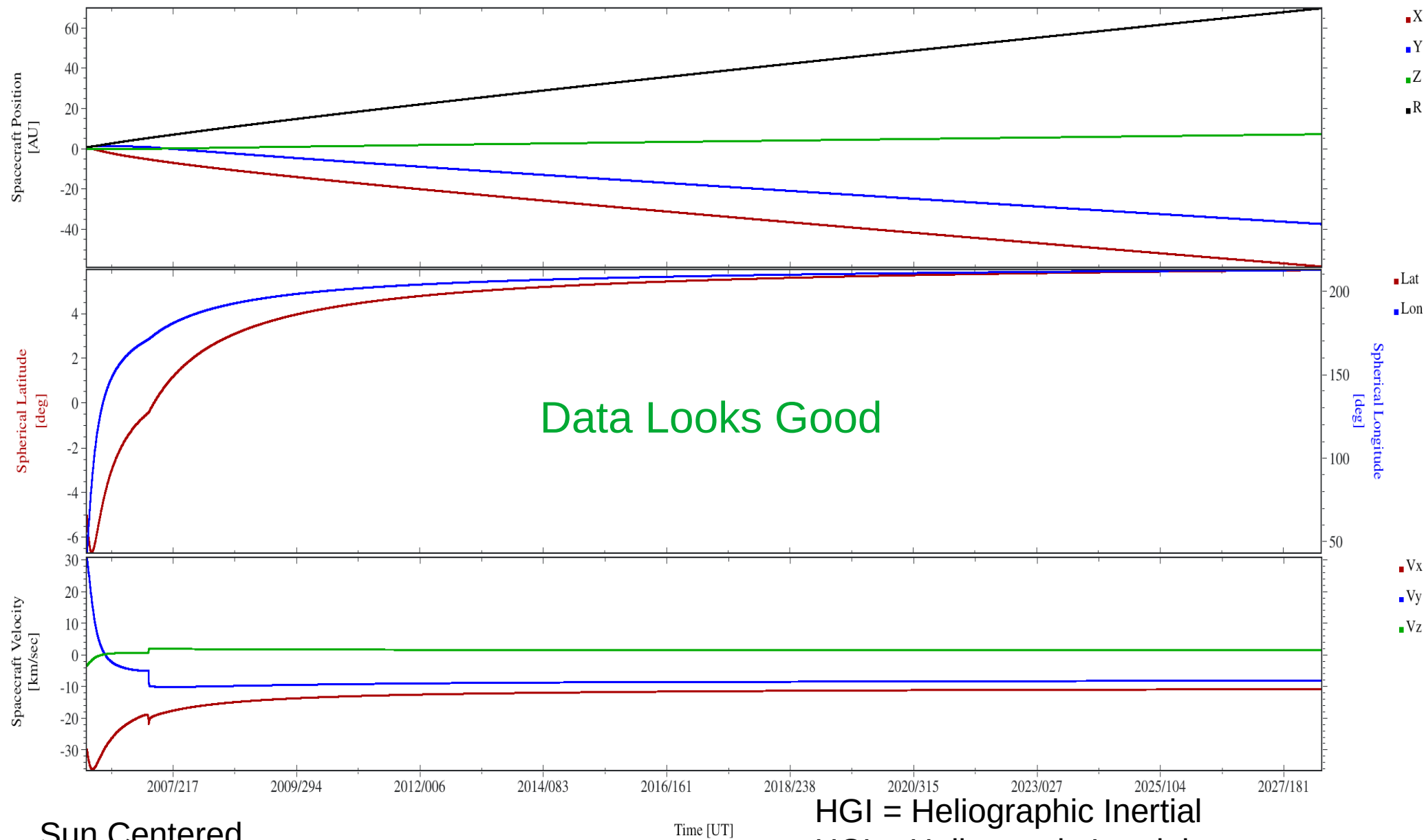
NASA PDS Validate v3.6.3: PASS

traj_hgi.lbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_hgi.tab

HCI Coordinate System - Sun Center



traj_hgi.xml

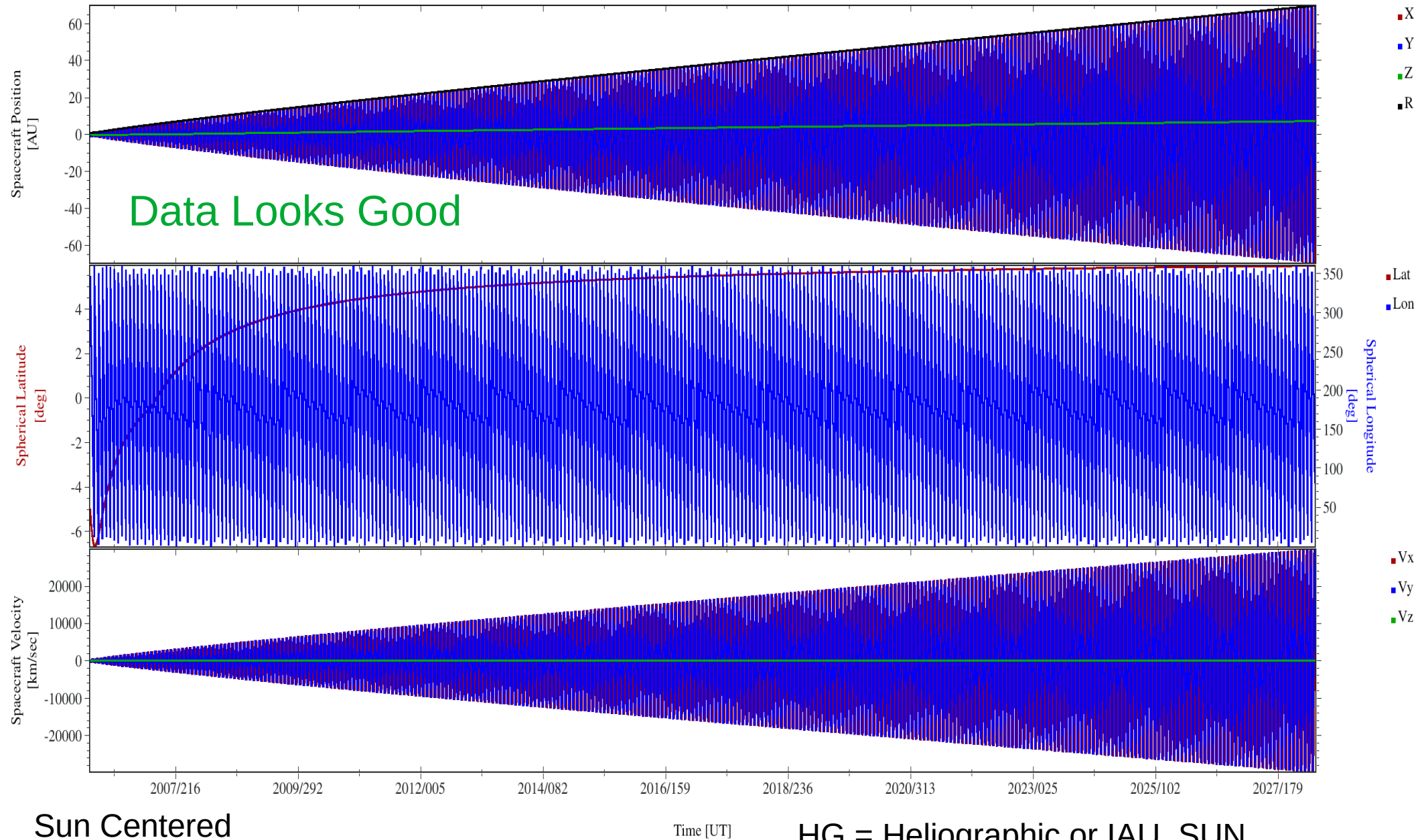
NASA PDS Validate v3.6.3: PASS

traj_hg.lbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_hg.tab

IAU_SUN Coordinate System - Sun Center



X

Y

Z

R

Lat

Lon

Vx

Vy

Vz

traj_hg.xml

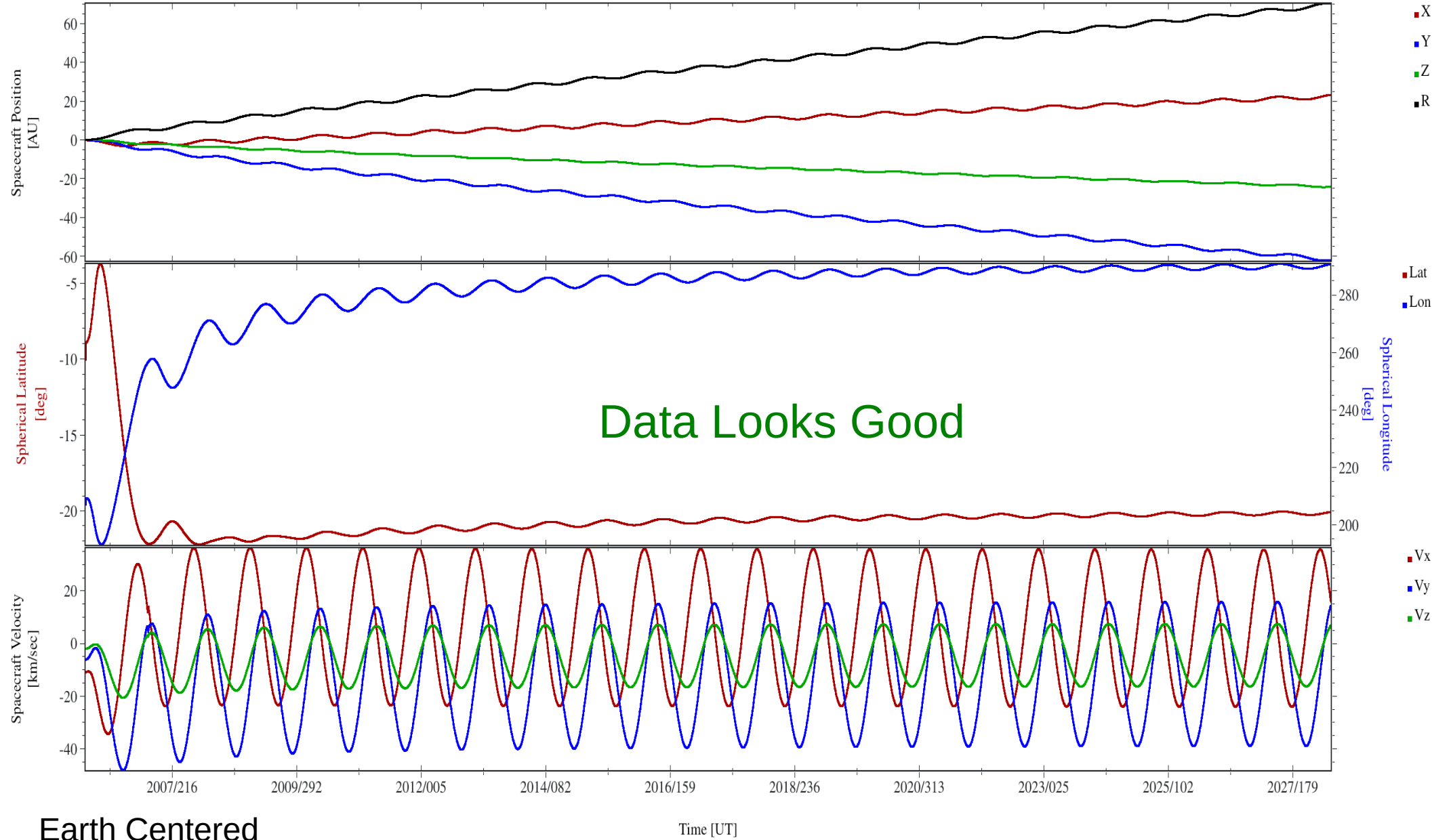
NASA PDS Validate v3.6.3: PASS

traj_j2000.lbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_j2000.tab

J2000 Coordinate System - Earth Center



traj_j2000.xml

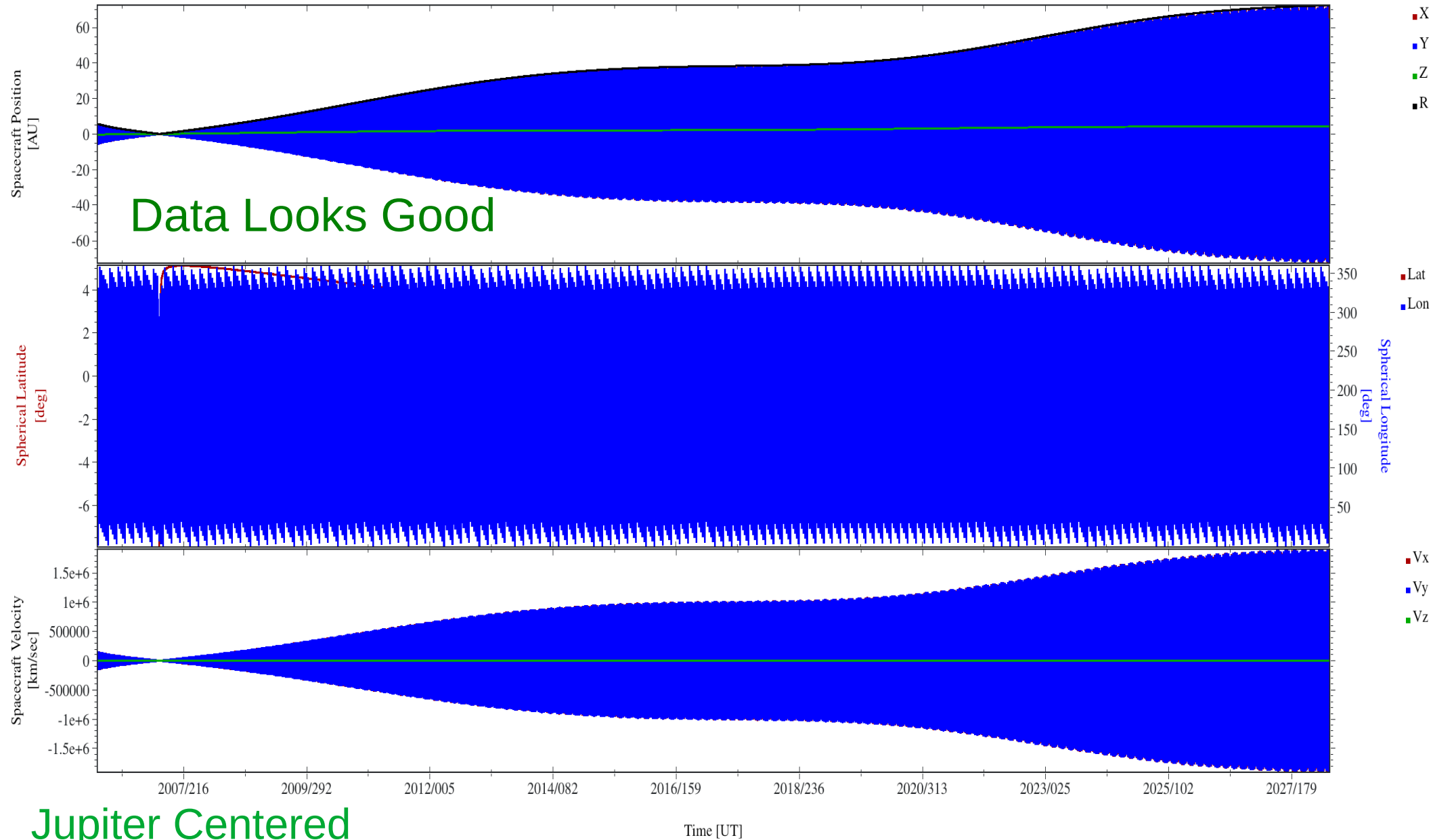
NASA PDS Validate v3.6.3: PASS

traj_jupiter_iau.lbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_jupiter_iau.tab

IAU_JUPITER Coordinate System - Jupiter Center



traj_jupiter_iau.xml

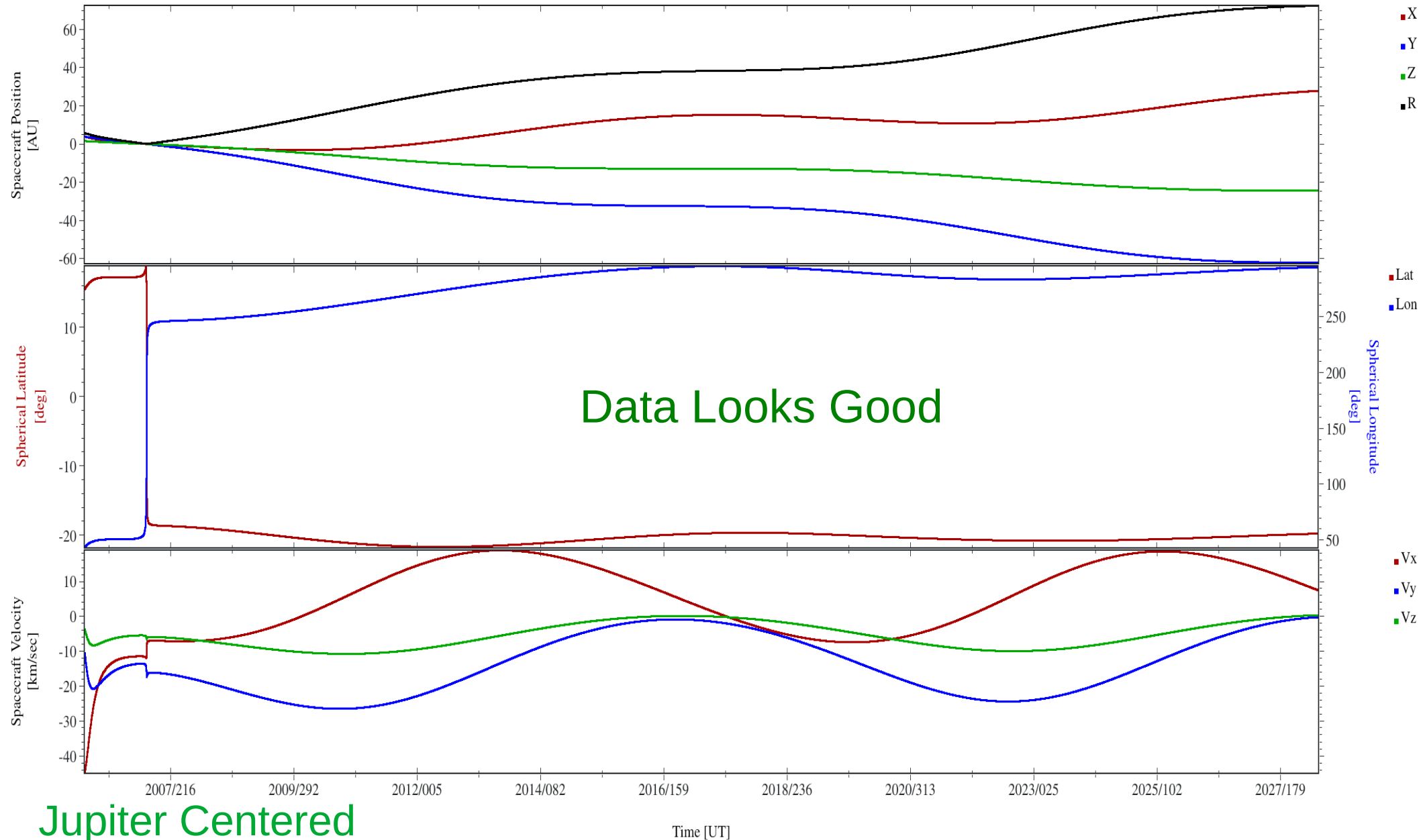
NASA PDS Validate v3.6.3: PASS

traj_jupiter_j2000.lbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_jupiter_j2000.tab

J2000 Coordinate System - Jupiter Center



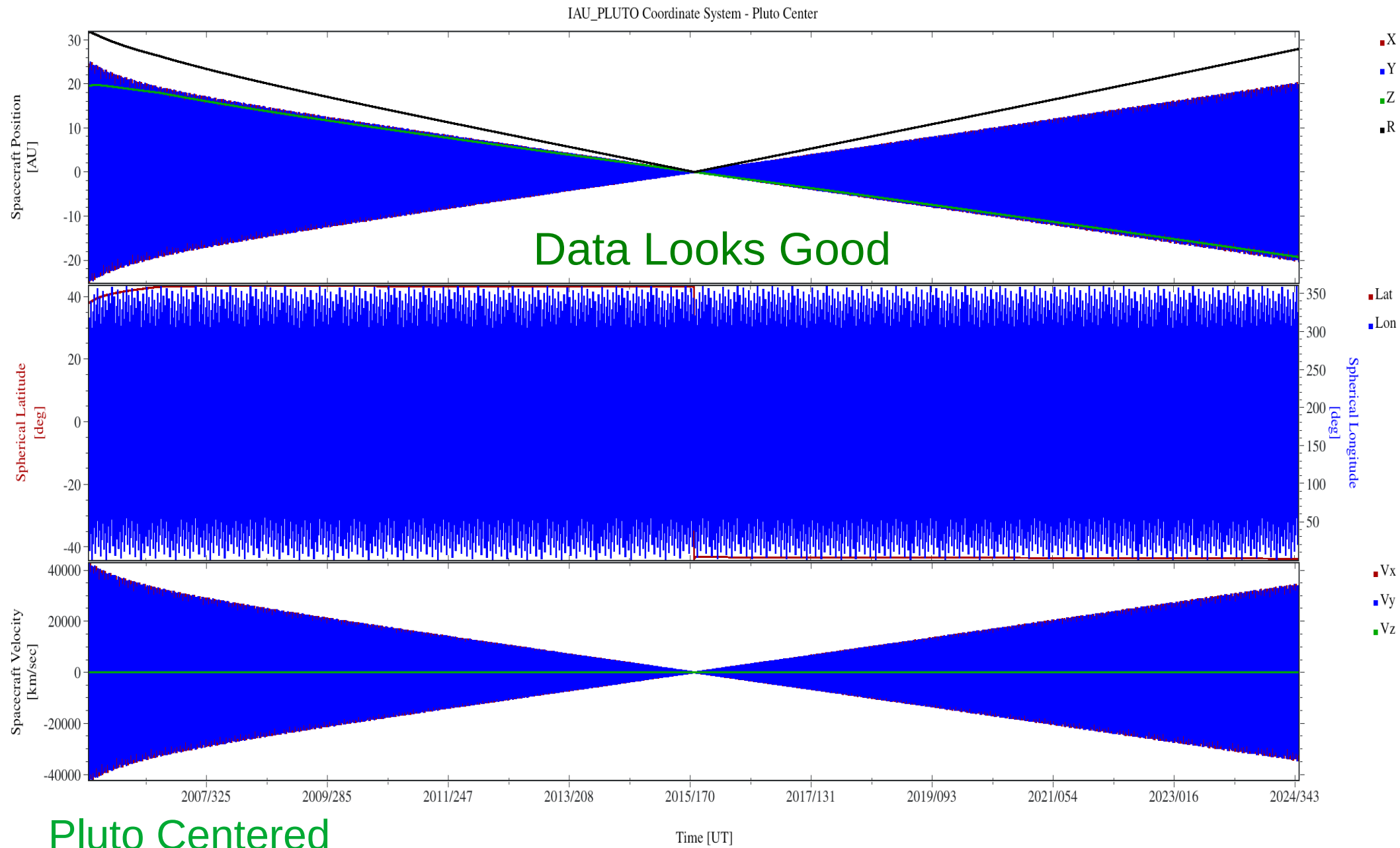
traj_jupiter_j2000.xml

NASA PDS Validate v3.6.3: PASS

traj_pluto_iau.lbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_pluto_iau.tab



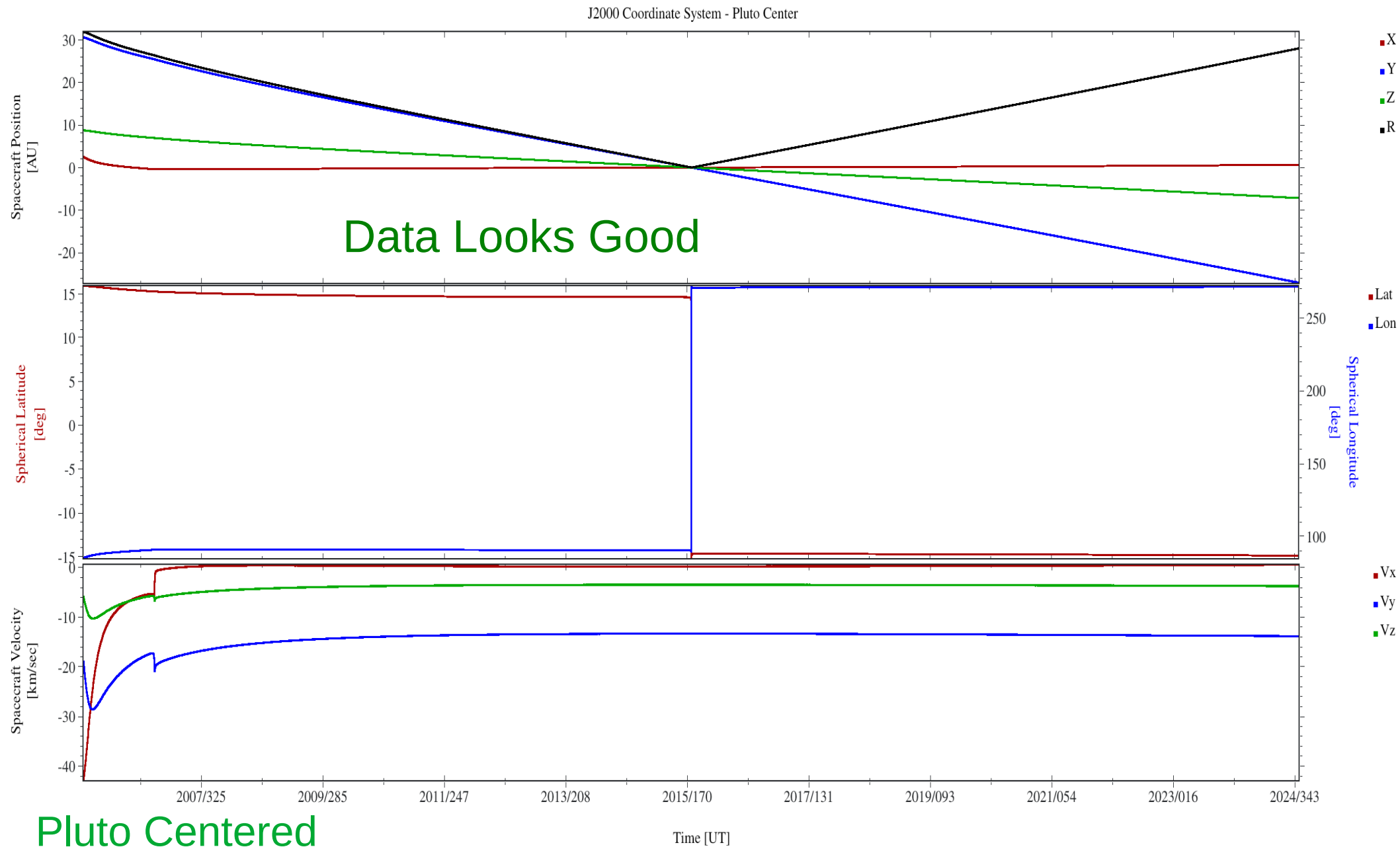
traj_pluto_iau.xml

NASA PDS Validate v3.6.3: PASS

traj_pluto_j2000.tbl

This looks like a PDS3 file. The information included in this file should be included in the PDS4 xml file. This file should not be included in a PDS4 archive.

traj_pluto_j2000.tab



traj_pluto_j2000.xml

NASA PDS Validate v3.6.3: PASS

PREVIOUSLY_RELEASED_FOR_REFERENCE

Remove this directory for PDS4 submission.

3) Documents for the SWAP Instrument v2.0

4) SWAP KEM1 Encounter Raw Data v2.0

5) SWAP KEM2 Encounter Raw Data v1.0

6) SWAP Reference Files Used in Calibrating Data v2.0

7) SWAP KEM1 Encounter Calibrated Data v2.0

collection.lblx

NASA PDS Validate v3.6.3: PASS

collection_inventory.csv

GOOD

overview.lblx – 1 of 2

Error Message from Browser:

XML Parsing Error: mismatched tag. Expected: </editor_list>.

Location: https://sbnreview.astro.umd.edu/revpro/nh_k7_2025/nh_swap/kem1_cal/overview.lblx

Line Number 17, Column 37:

<editor_list>Gobat, C.</author_list>

-----^

overview.lblx – 2 of 2

Error Message from NASA PDS Validate v3.6.3:

Fatal error: [node=null,object=null,url=file:overview.lblx,line=17,col=37,offset=-1]: The element type "editor_list" must be terminated by the matching end-tag "</editor_list>".

Error on line 17 column 37 of overview.lblx:

SXXP0003 Error reported by XML parser: The element type "editor_list" must be terminated by the matching end-tag "</editor_list>".

Error on line 17 column 37 of overview.lblx:

SXXP0003 Error reported by XML parser: The element type "editor_list" must be terminated by the matching end-tag "</editor_list>".

Error on line 17 column 37 of overview.lblx:

SXXP0003 Error reported by XML parser: The element type "editor_list" must be terminated by the matching end-tag "</editor_list>".

Fatal error: [node=null,object=null,url=file:overview.lblx,line=17,col=37,offset=-1]: The element type "editor_list" must be terminated by the matching end-tag "</editor_list>".

Product Level Validation Results

FAIL: file:overview.lblx

WARNING [error.validation.missing_required_file] Cannot check versioning because XML could not be parsed.

ERROR [error.label.schema] line 17, 37: The element type "editor_list" must be terminated by the matching end-tag "</editor_list>".

1 product validation(s) completed

`*0x584_sci.lblx`

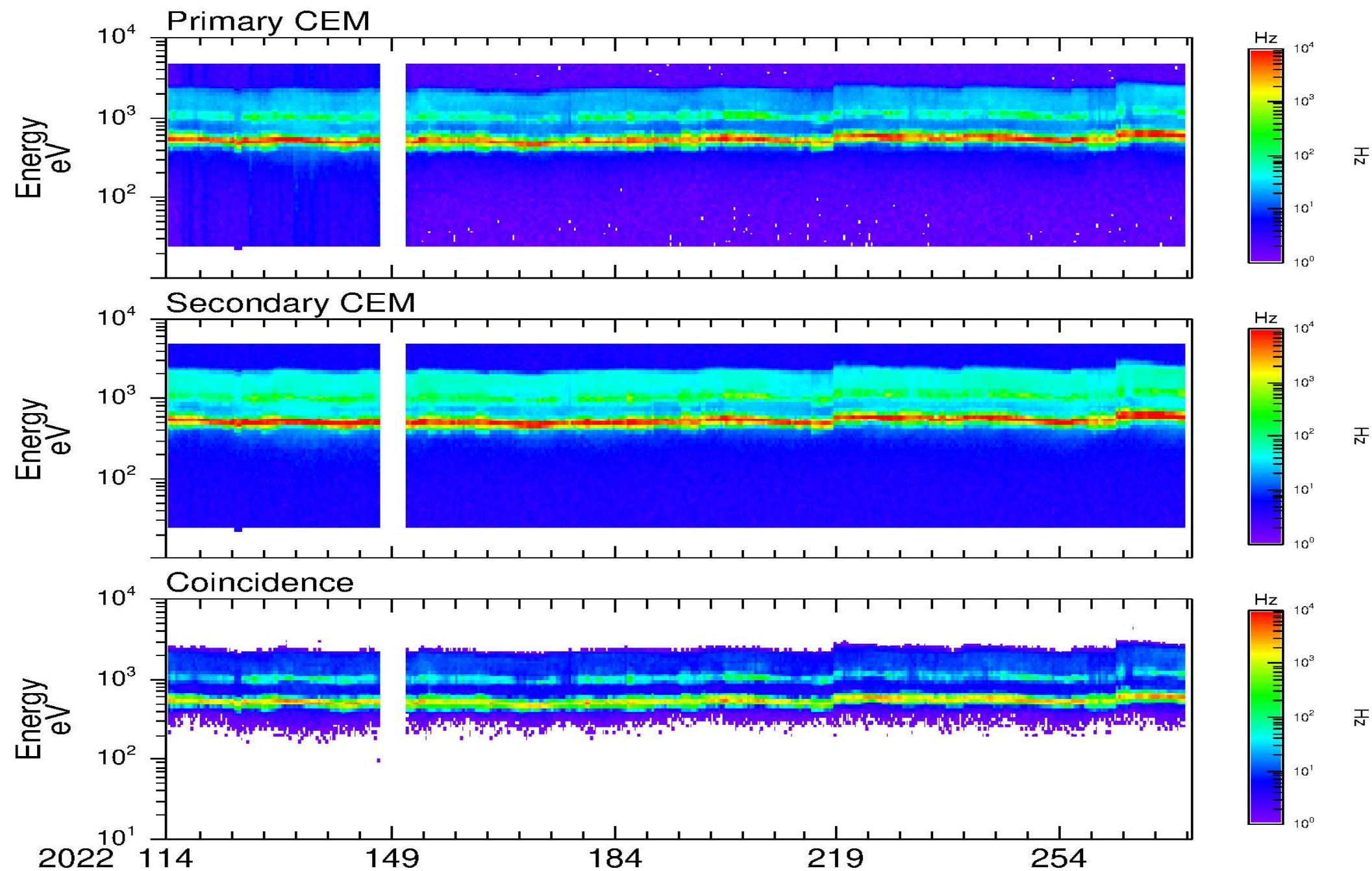
NASA PDS Validate v3.6.3: PASS

Calibrated Science Data (*0x584.sci.fit)

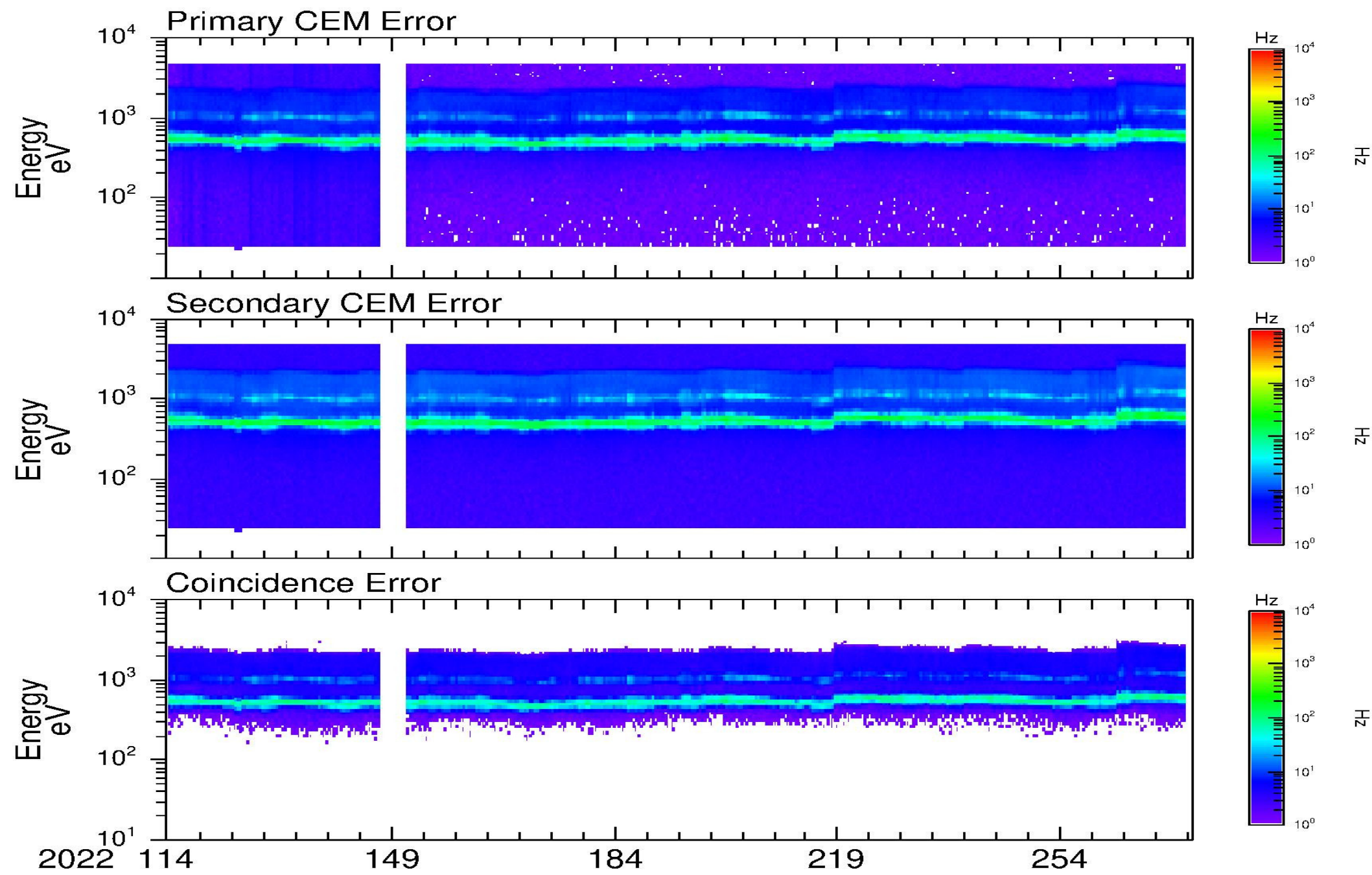
fv: Summary of swa_0513129600_0x584_sci.../PDS/Reviews/NH/SWAP_2024/2nd/kem1_cal/

Index	Extension	Type	Dimension	View				
0	Primary	Image	0	Header	Image	Table		
1	REAL_TIME	Binary	38 cols X 8640 rows	Header	Hist	Plot	All	Select
2	ERROR_BARS	Binary	17 cols X 8640 rows	Header	Hist	Plot	All	Select
3	PCEM_SPECT_HZ	Image	135 X 64	Header	Image	Table		
4	SCEM_SPECT_HZ	Image	135 X 64	Header	Image	Table		
5	COIN_SPECT_HZ	Image	135 X 64	Header	Image	Table		
6	PCEM_ERROR_BARS_SPECT_HZ	Image	135 X 64	Header	Image	Table		
7	SCEM_ERROR_BARS_SPECT_HZ	Image	135 X 64	Header	Image	Table		
8	COIN_ERROR_BARS_SPECT_HZ	Image	135 X 64	Header	Image	Table		
9	ENERGY_LABEL_SPECT	Binary	66 cols X 1 rows	Header	Hist	Plot	All	Select
10	TIME_LABEL_SPECT	Binary	15 cols X 135 rows	Header	Hist	Plot	All	Select
11	HOUSEKEEPING	Binary	99 cols X 24 rows	Header	Hist	Plot	All	Select
12	QUALITY	Binary	56 cols X 24 rows	Header	Hist	Plot	All	Select
13	THRUSTERS	Binary	22 cols X 0 rows	Header	Hist	Plot	All	Select
14	SPICE_ORBIT_ATTITUDE_CALC	Binary	89 cols X 8640 rows	Header	Hist	Plot	All	Select

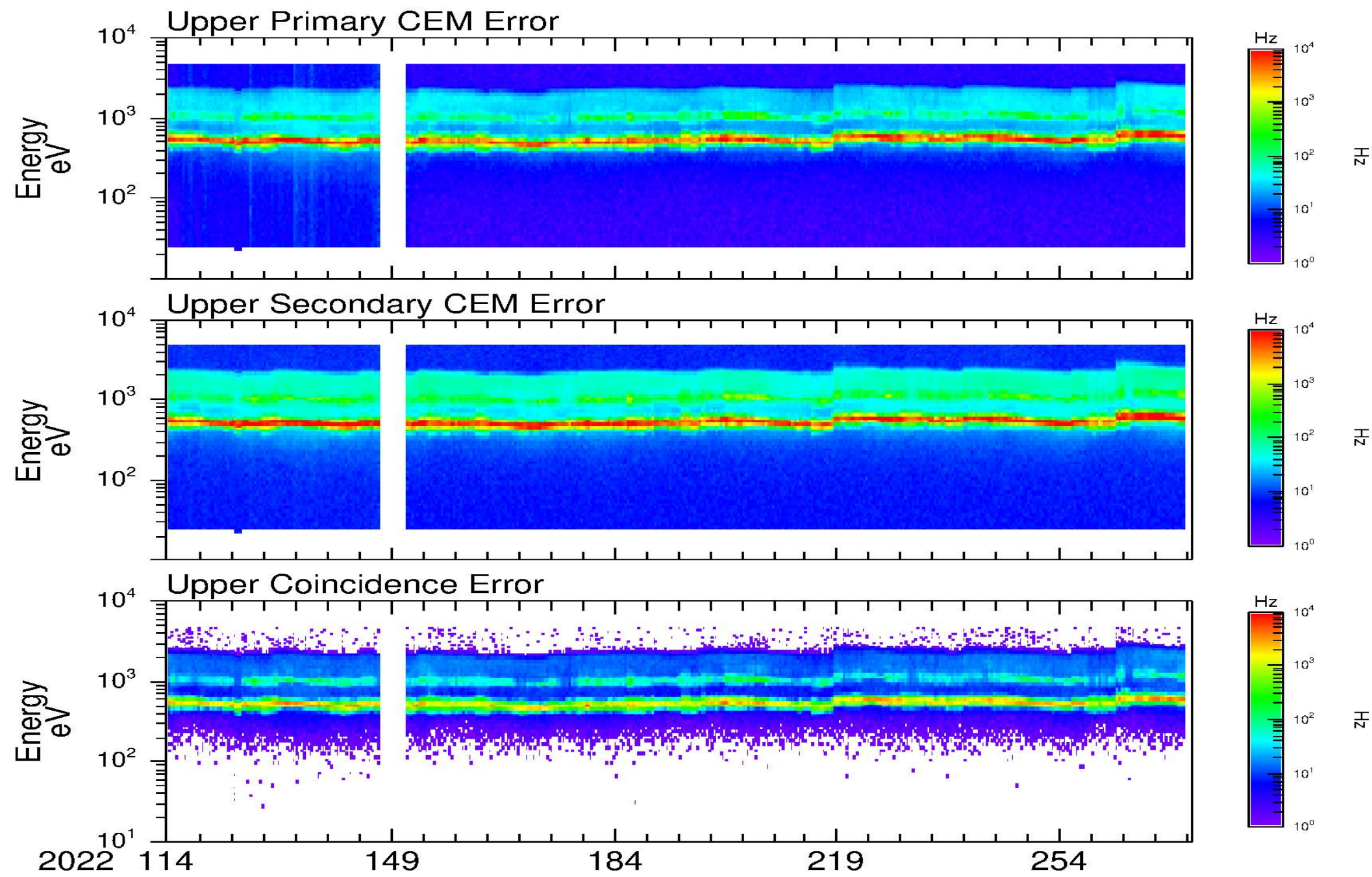
HDU (Index+1): 10, 11, 4, 5, 6



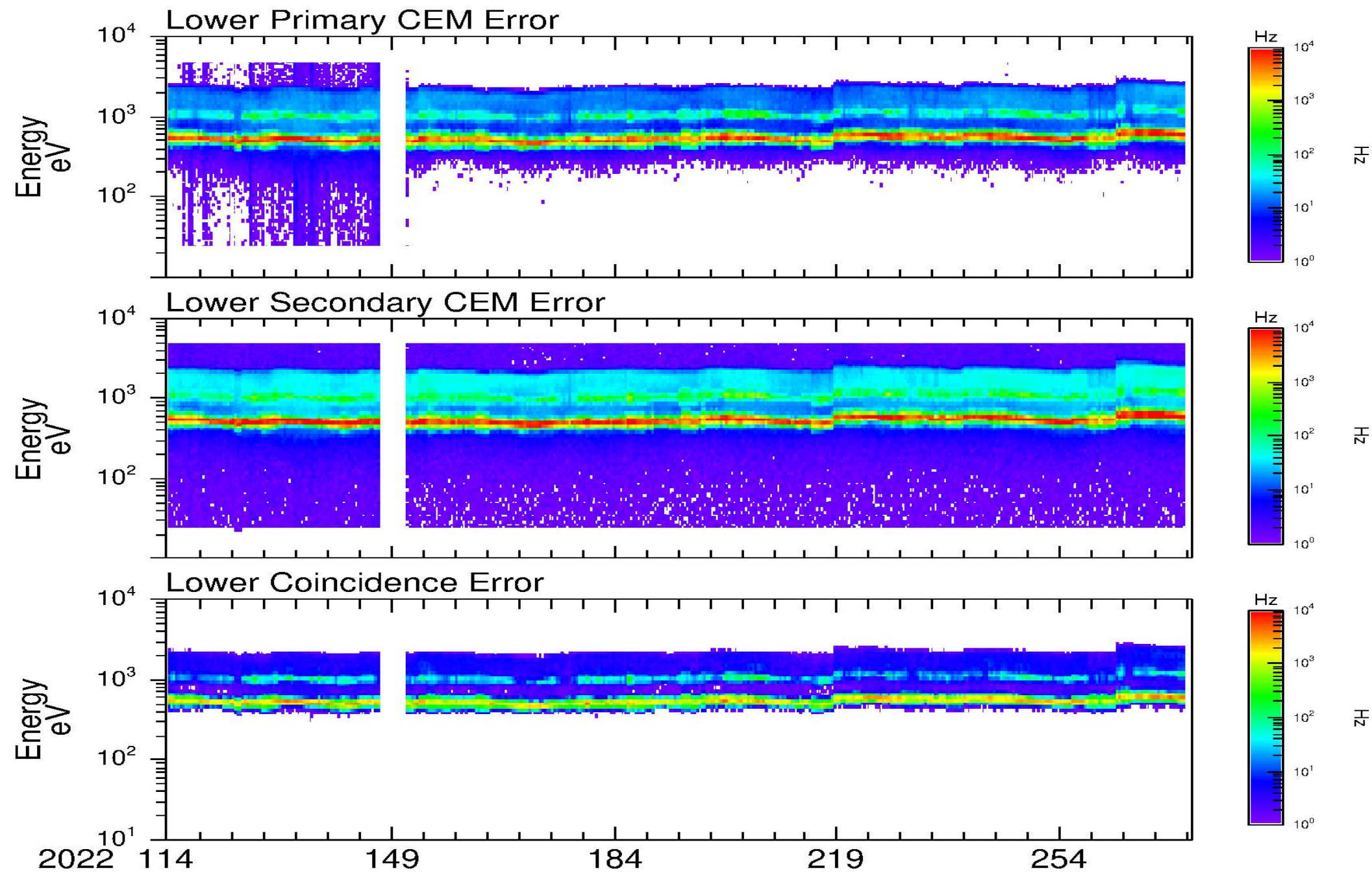
HDU (Index+1): 10, 11, 7, 8, 9



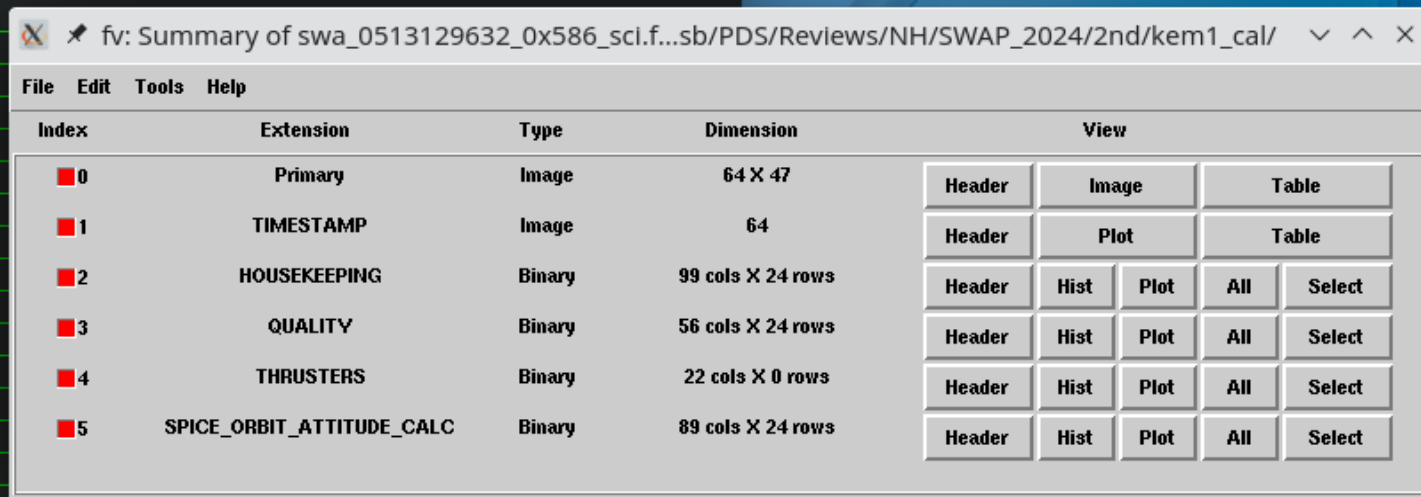
HDU (Index+1): 10, 11, 4+7, 5+8, 6+9



HDU (Index+1): 10, 11, 4-7, 5-8, 6-9

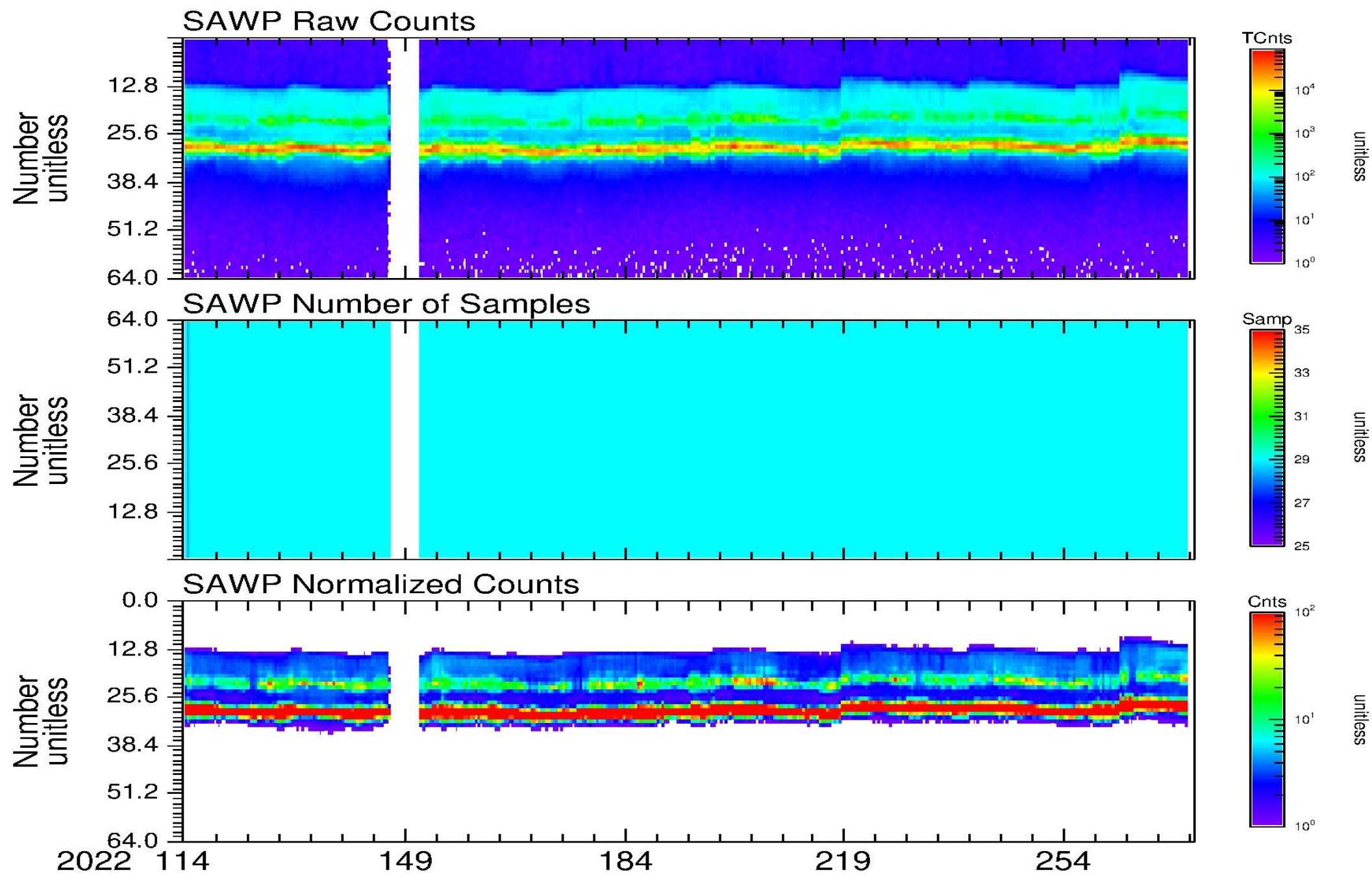


Calibrated Histogram Data (*0x586.sci.fit)



fv: Summary of swa_0513129632_0x586_sci.f...sb/PDS/Reviews/NH/SWAP_2024/2nd/kem1_cal/				
File Edit Tools Help				
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

HDU (Index+1): 1, 2



8) SWAP KEM2 Encounter Calibrated Data v1.0

collection.lblx

NASA PDS Validate v3.6.3: PASS

collection_inventory.csv

GOOD

overview.lblx

NASA PDS Validate v3.6.3: PASS

overview.txt

GOOD

`*0x584_sci.lblx`

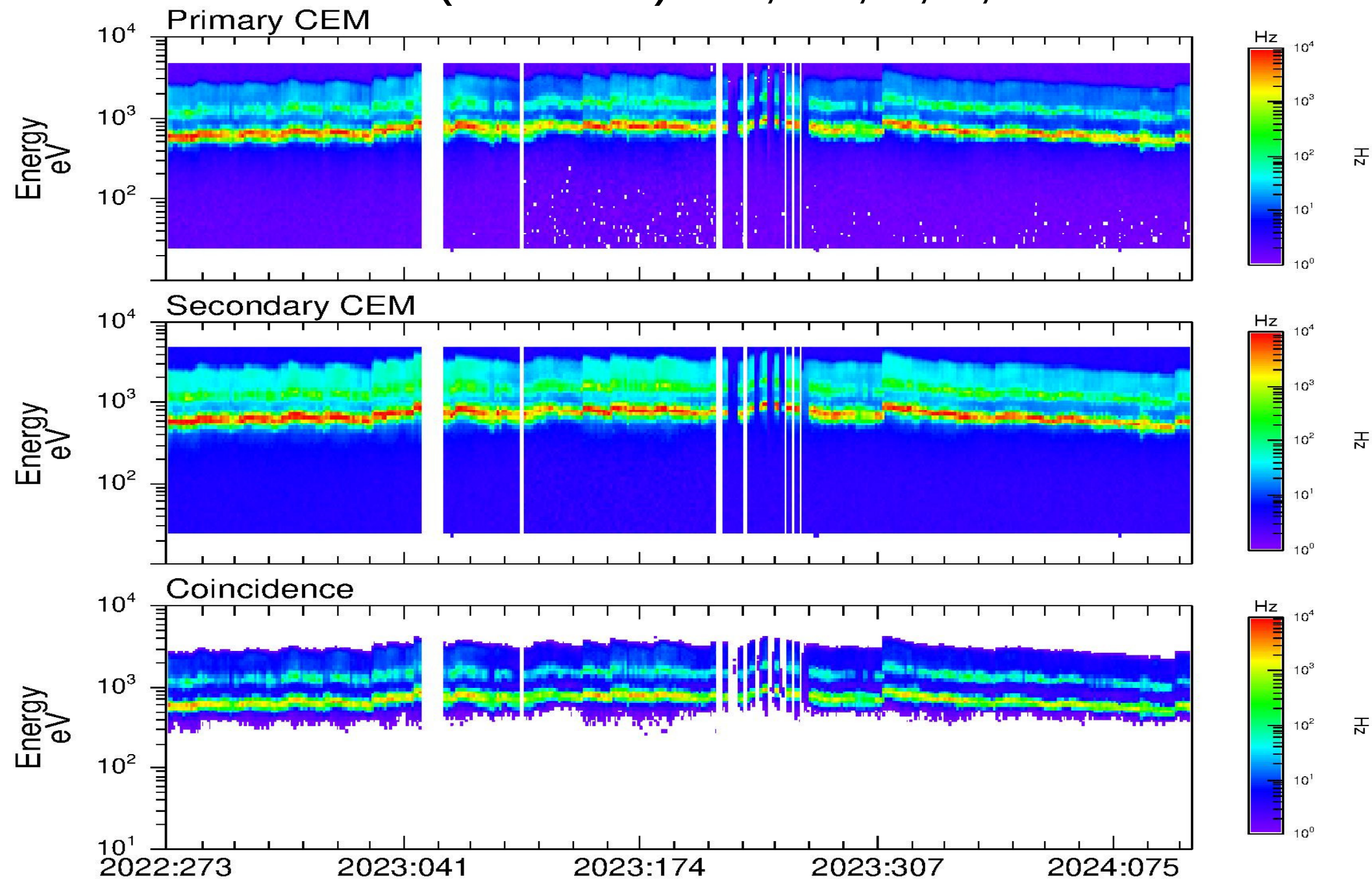
NASA PDS Validate v3.6.3: PASS

Calibrated Science Data (*0x584.sci.fit)

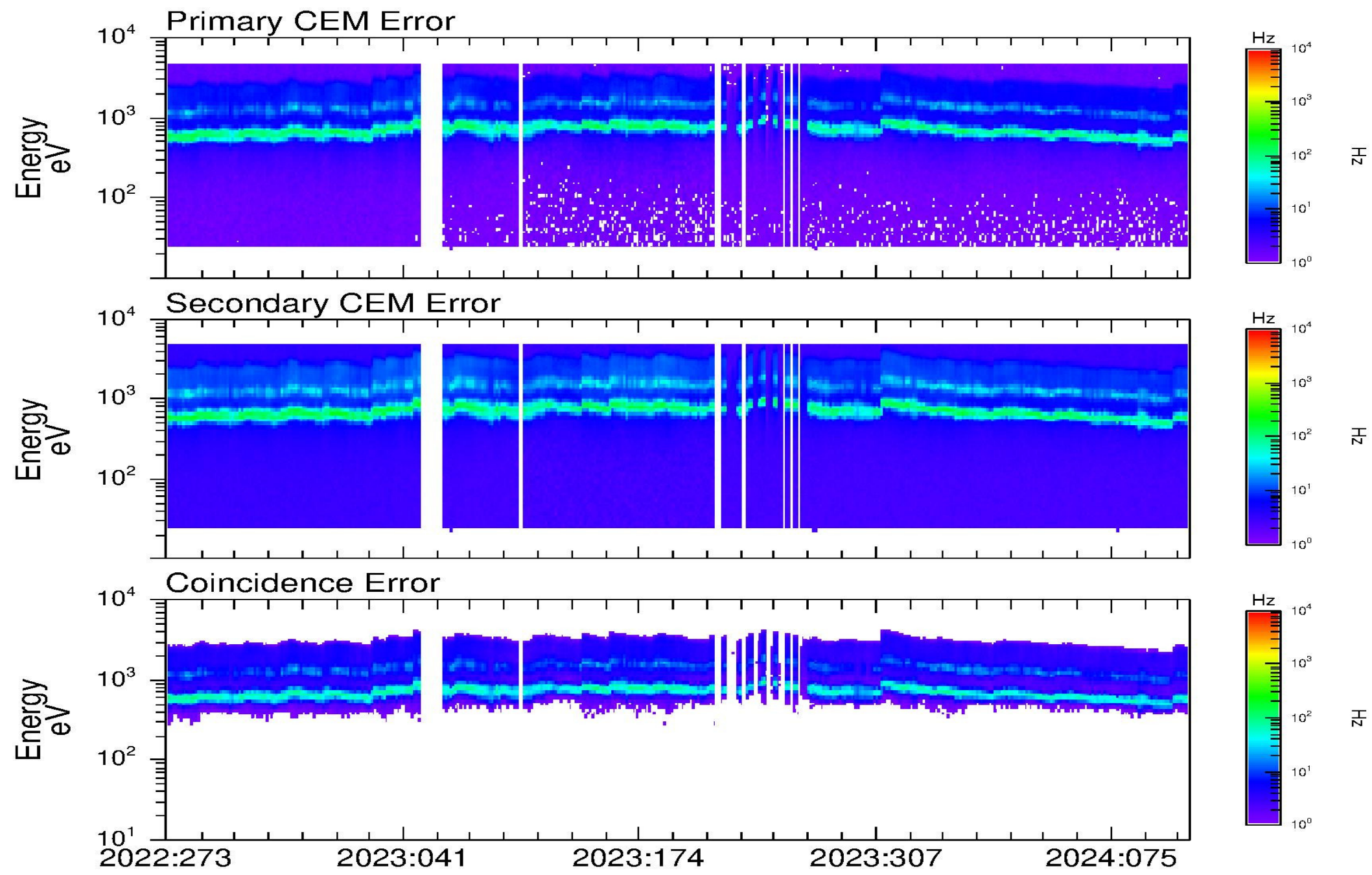
fv: Summary of swa_0527040000_0x584_sci.fit ...t/usb/PDS/Reviews/NH/SWAP_2024/2nd/kem2_cal/

File	Edit	Tools	Help					
Index	Extension	Type	Dimension	View				
0	Primary	Image	0	Header	Image		Table	
1	REAL_TIME	Binary	38 cols X 8640 rows	Header	Hist	Plot	All	Select
2	ERROR_BARS	Binary	17 cols X 8640 rows	Header	Hist	Plot	All	Select
3	PCEM_SPECT_HZ	Image	135 X 64	Header	Image		Table	
4	SCEM_SPECT_HZ	Image	135 X 64	Header	Image		Table	
5	COIN_SPECT_HZ	Image	135 X 64	Header	Image		Table	
6	PCEM_ERROR_BARS_SPECT_HZ	Image	135 X 64	Header	Image		Table	
7	SCEM_ERROR_BARS_SPECT_HZ	Image	135 X 64	Header	Image		Table	
8	COIN_ERROR_BARS_SPECT_HZ	Image	135 X 64	Header	Image		Table	
9	ENERGY_LABEL_SPECT	Binary	66 cols X 1 rows	Header	Hist	Plot	All	Select
10	TIME_LABEL_SPECT	Binary	15 cols X 135 rows	Header	Hist	Plot	All	Select
11	HOUSEKEEPING	Binary	99 cols X 24 rows	Header	Hist	Plot	All	Select
12	QUALITY	Binary	56 cols X 24 rows	Header	Hist	Plot	All	Select
13	THRUSTERS	Binary	22 cols X 0 rows	Header	Hist	Plot	All	Select
14	SPICE_ORBIT_ATTITUDE_CALC	Binary	89 cols X 8640 rows	Header	Hist	Plot	All	Select

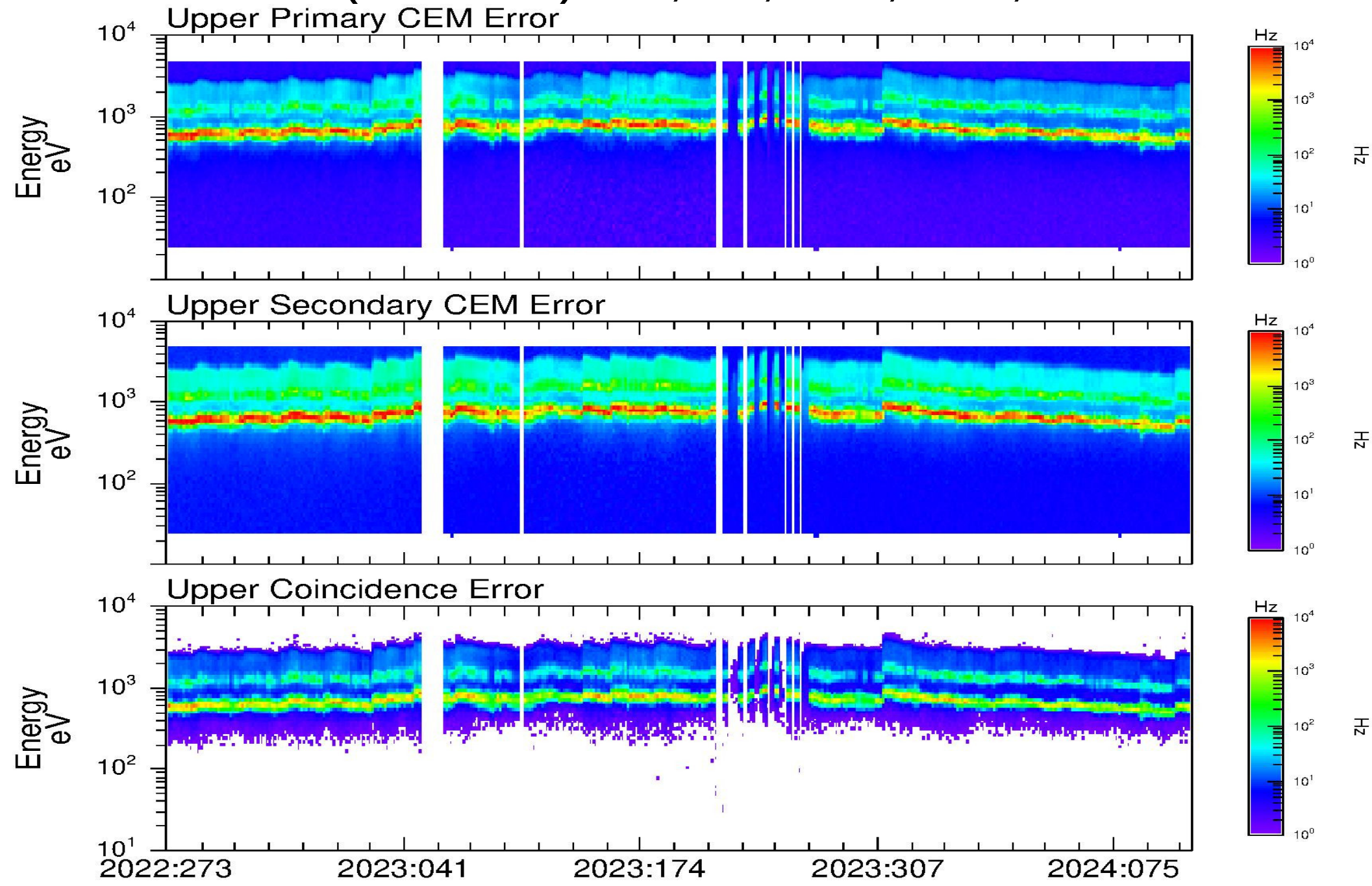
HDU (Index+1): 10, 11, 4, 5, 6



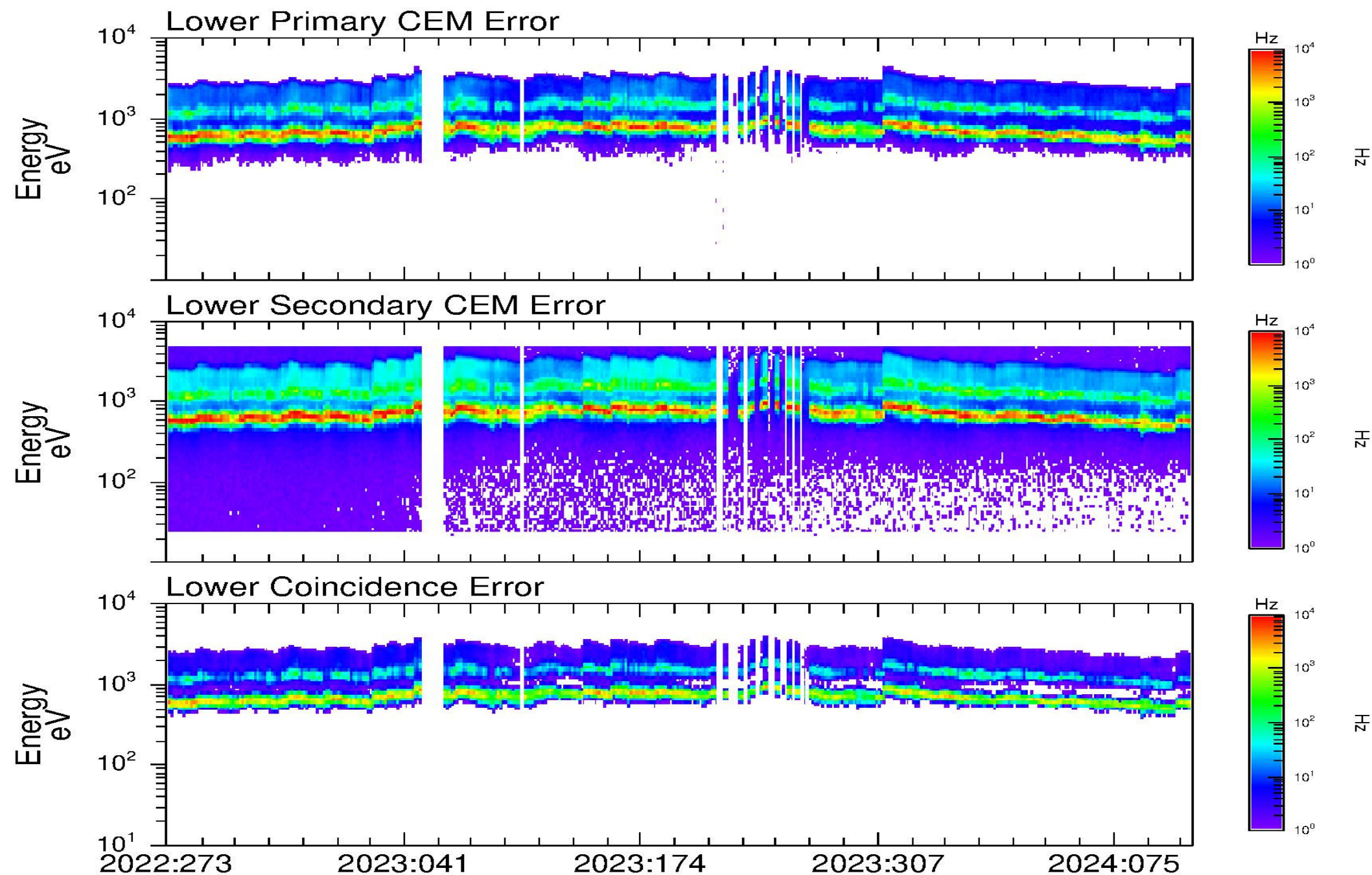
HDU (Index+1): 10, 11, 7, 8, 9



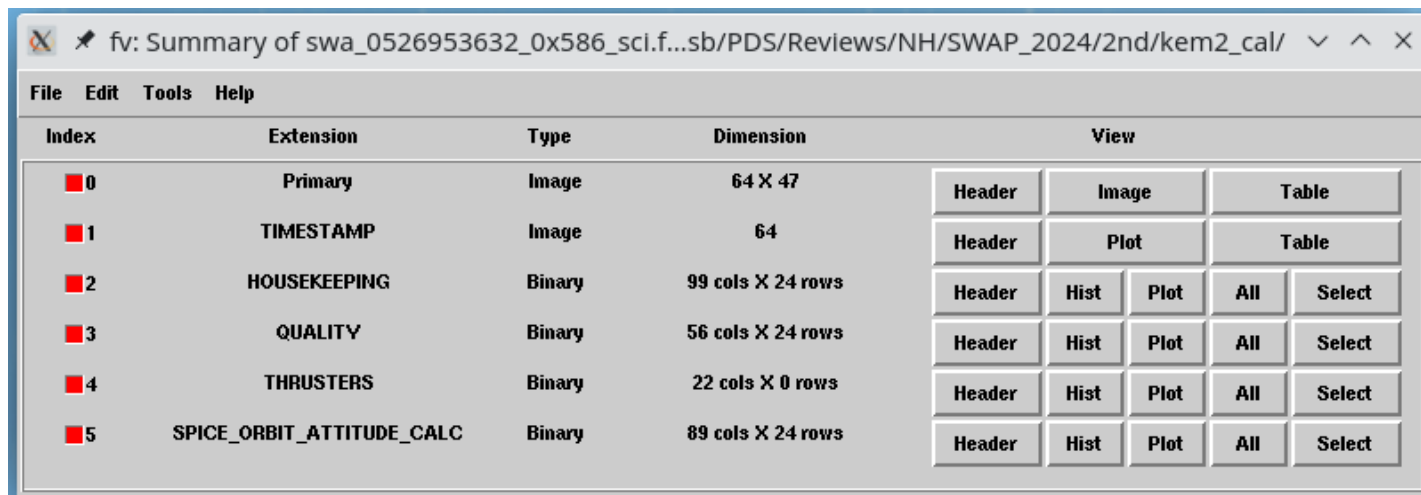
HDU (Index+1): 10, 11, 4+7, 5+8, 6+9



HDU (Index+1): 10, 11, 4-7, 5-8, 6-9



Calibrated Histogram Data (*0x586.sci.fit)



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

BACK-UP SLIDES

Example Spectrum

Swaczyna et al., Astrophysical Journal, 2020.

