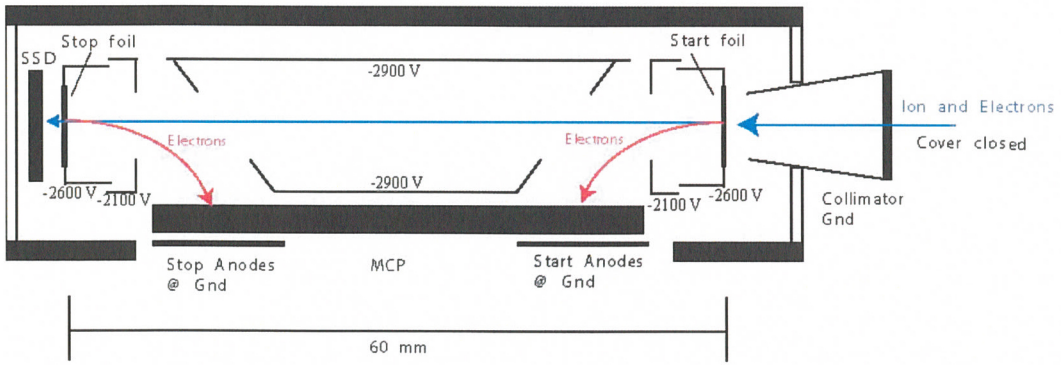
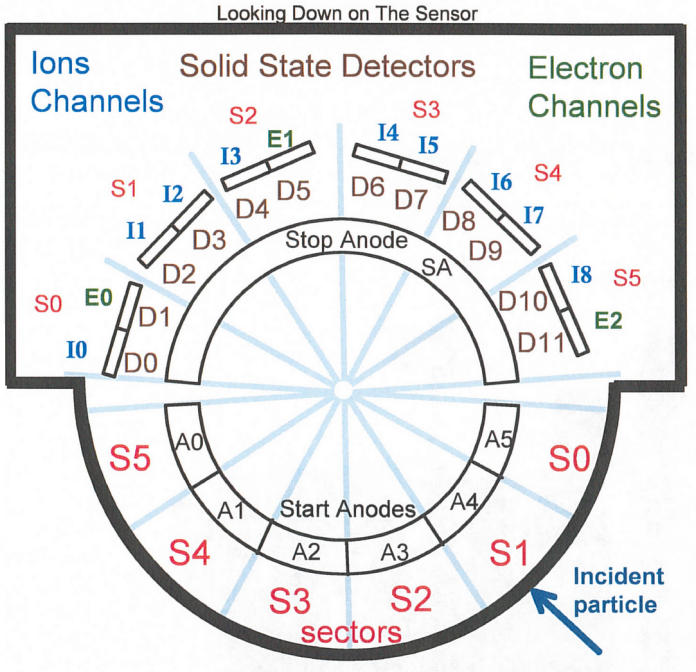
New Horizons Pluto Energetic Particle Spectrometer Science Investigation (PEPSSI)

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

RAW Data Sets:
nh-a-pepssi-2-kem1-v4.0

CALIBRATED Data Sets:
nh-a-pepssi-3-kem1-v4.0

New Horizons PEPSSI Data Set Evaluation Tools

Staging and Evaluation -

- Machine: Dell Precision Tower 5810
- Operating System: Fedora 31 linux

Data Processing -

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

Minor Diagnostics -

- Machine: Dell 7520
- Operating System: Fedora 31 linux

Documentation Evaluation

nh-a-pepssi-2-kem1-v4.0
nh-a-pepssi-3-kem1-v4.0
aareadme.txt

GOOD

nh-a-pepssi-2-kem1-v4.0
nh-a-pepssi-3-kem1-v4.0
voldesc.txt

GOOD

nh-a-pepssi-2-kem1-v4.0/catalog
nh-a-pepssi-3-kem1-v4.0/catalog
catinfo.txt

GOOD

nh-a-pepssi-2-kem1-v4.0/catalog
nh-a-pepssi-3-kem1-v4.0/catalog
dataset.cat

GOOD

nh-a-pepssi-2-kem1-v4.0/catalog
nh-a-pepssi-3-kem1-v4.0/catalog
nhsc.cat

Minor edits sent to PDS

nh-a-pepssi-2-kem1-v4.0/catalog
nh-a-pepssi-3-kem1-v4.0/catalog
nh_kem.cat

Minor edits send to PDS

nh-a-pepssi-2-kem1-v4.0/catalog
nh-a-pepssi-3-kem1-v4.0/catalog
pepssi.cat

Under the section: Data sampling and priority for TOF-only data

```
suppress the more desirable TOF > 20 ns events.  Additionally, the N3
PHA data uses a different priority scheme than the N2 PHA data (this
may be changed in a future software update, but that hasn't happened as
of June, 2016).  In the N3 PHA the TOF < 20 ns priority group is only
```

What about this data set? Since the instrument commanding for v4.0 has already occurred, the instrument team should already know if they have changed the priority scheme.

nh-a-pepssi-2-kem1-v4.0/catalog
nh-a-pepssi-3-kem1-v4.0/catalog
ref.cat

GOOD

nh-a-pepssi-3-kem1-v4.0/document
docinfo.txt

GOOD

nh-a-pepssi-3-kem1-v4.0/document
codmac_level_definitions.lbl
codmac_level_definitions.pdf

GOOD

nh-a-pepssi-3-kem1-v4.0/document
lunineetal1995.lbl & lunineetal1995.pdf

GOOD

nh-a-pepssi-3-kem1-v4.0/document
nh_met2utc.lbl & nh_met2utc.tab

GOOD

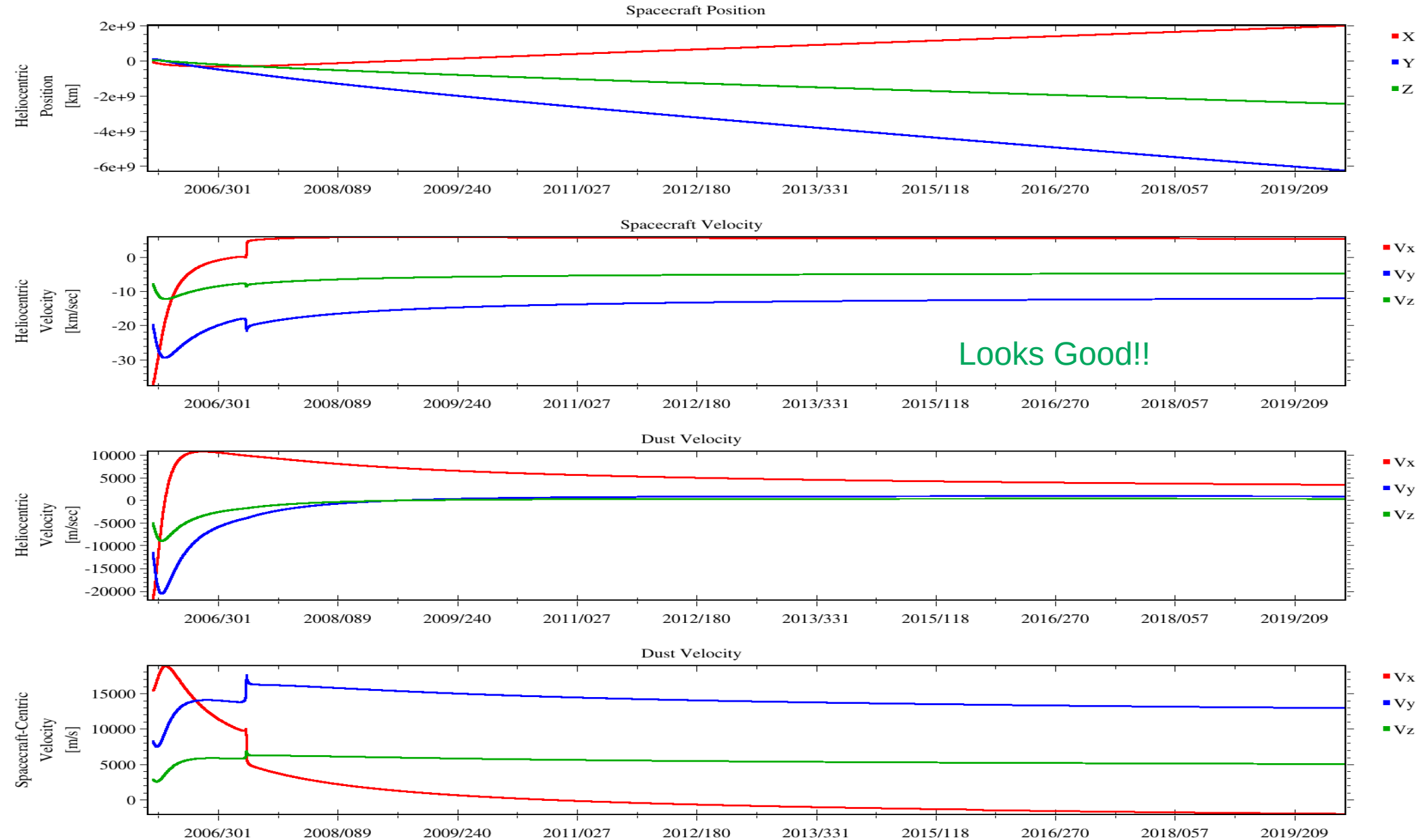
nh-a-pepssi-3-kem1-v4.0/document
nh_fov.lbl & nh_fov.pdf

GOOD

nh-a-pepssi-3-kem1-v4.0/document
nh_mission_trajectory.lbl

GOOD

nh-a-pepssi-3-kem1-v4.0/document
nh_mission_trajectory.tab



Plot created by SDDAS/gPlot - J. Mukherjee, et al. Generated on Sat Nov 28 14:08:13 2020.

nh-a-pepssi-3-kem1-v4.0/document
nh_pepssi_v110_ti.txt

GOOD

nh-a-pepssi-3-kem1-v4.0/document
payload_ssr.lbl & payload_ssr.pdf

GOOD

nh-a-pepssi-3-kem1-v4.0/document
pep_bti.lbl & pep_bti.pdf

GOOD

nh-a-pepssi-3-kem1-v4.0/document
pepssi_ssr.lbl & pepssi_ssr.pdf

GOOD

nh-a-pepssi-3-kem1-v4.0/document
quat_axyz_instr_to_j2k.lbl
quat_axyz_instr_to_j2k.asc

GOOD

nh-a-pepssi-3-kem1-v4.0/document
seq_pepssi_kem1.lbl
seq_pepssi_kem1.tab

GOOD

nh-a-pepssi-3-kem1-v4.0/calib
calinfo.txt

GOOD

nh-a-pepssi-3-kem1-v4.0/calib
hk_n1_input_20050228.lbl
hk_n1_input_20050228.tab

GOOD

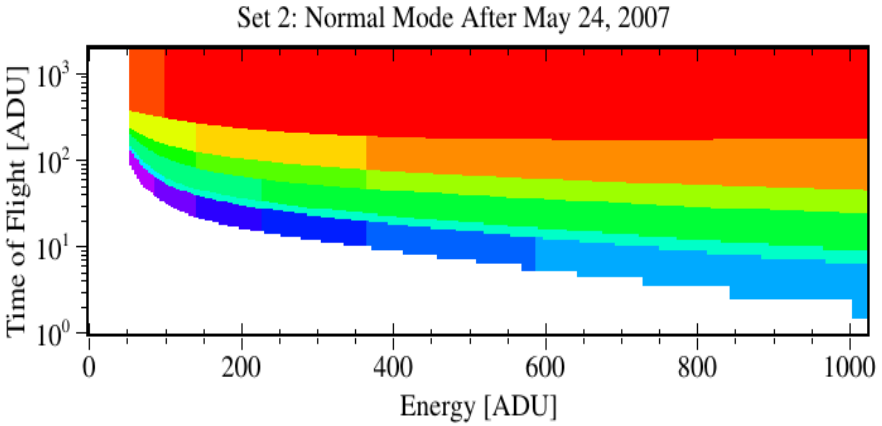
nh-a-pepssi-3-kem1-v4.0/calib
hk_stat_input_20041016.lbl
hk_stat_input_20041016.tab

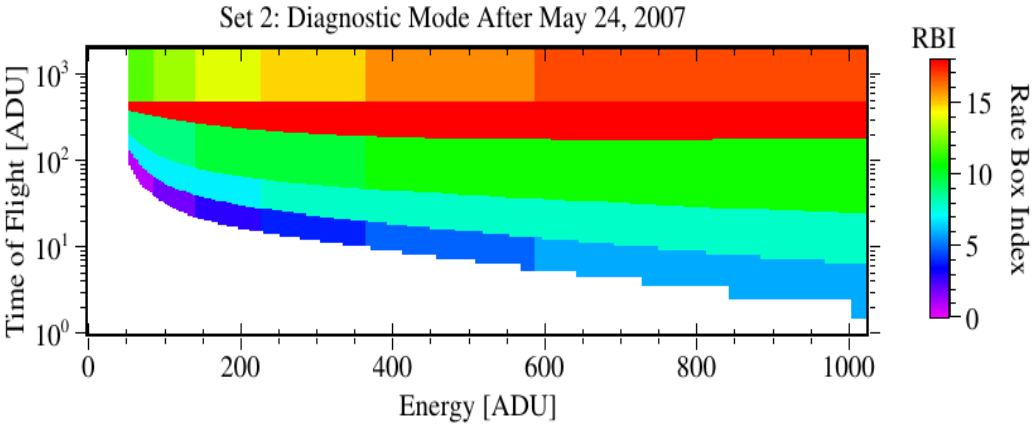
GOOD

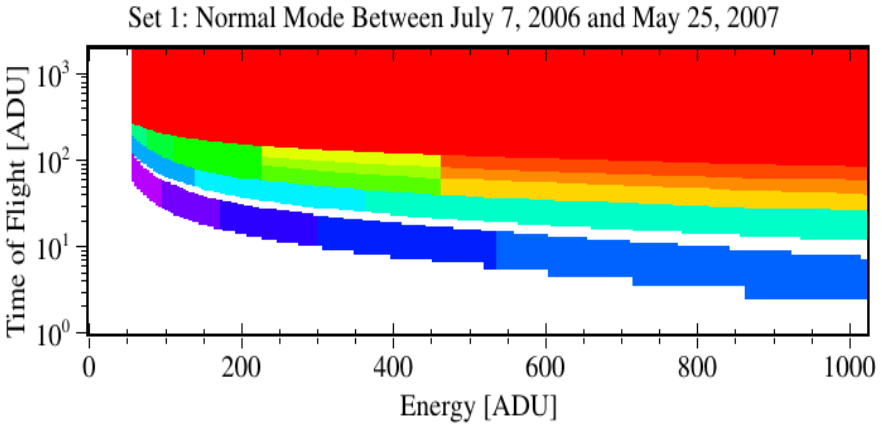
nh-a-pepssi-3-kem1-v4.0/calib
rateboxdefinitionplanes.lbl

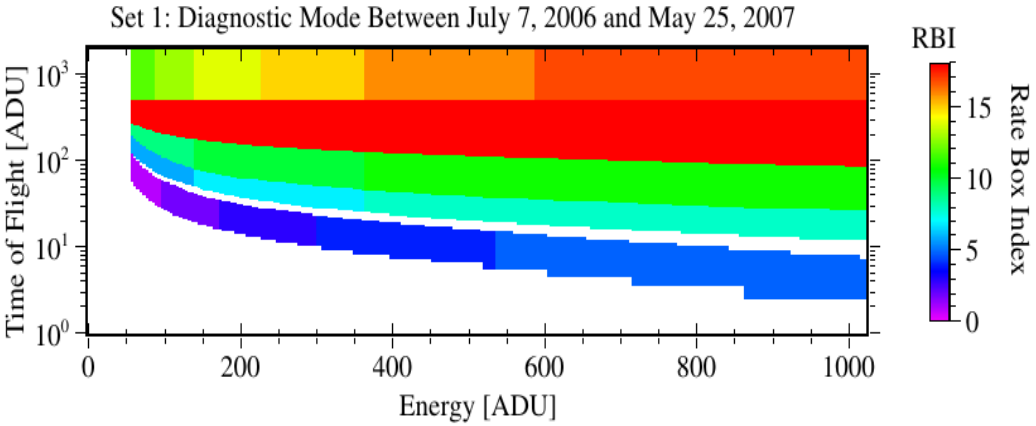
GOOD

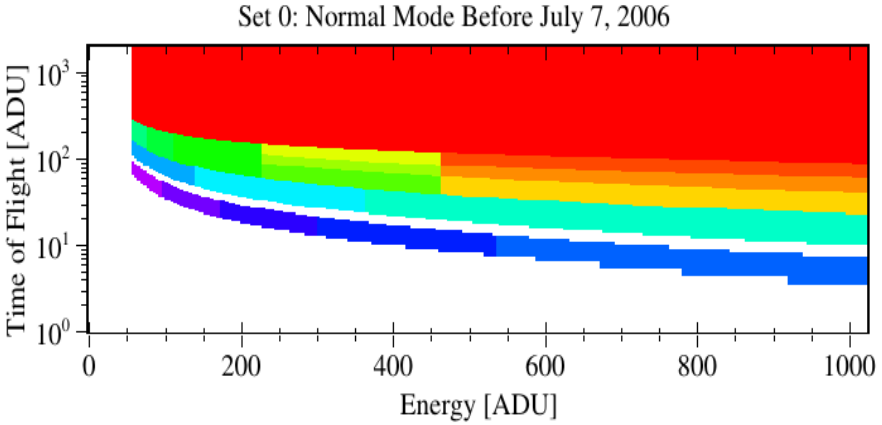
nh-a-pepssi-3-kem1-v4.0/calib rateboxdefinitionplanes.fit

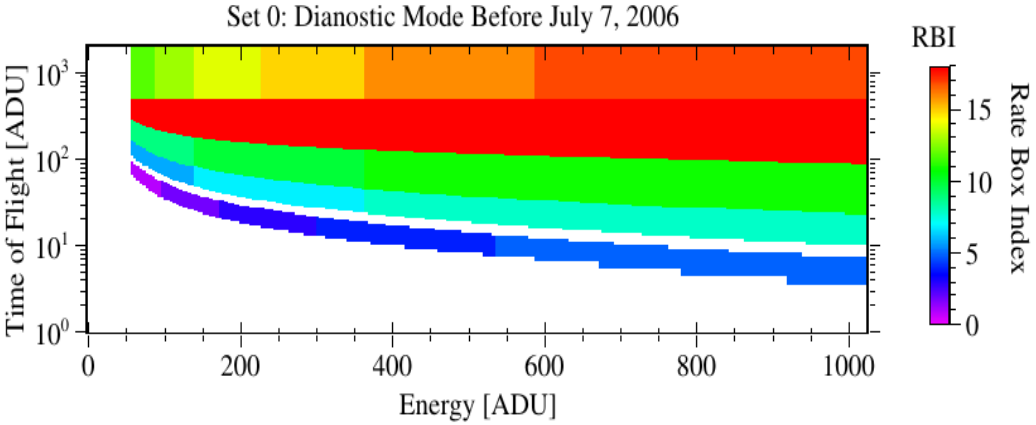












Plot created by SDDAS/gPlot - J. Mukherjee, et al. Generated on Sat Nov 28 14:39:53 2020.

nh-a-pepssi-3-kem1-v4.0/calib/calpars
calpinfo.txt

GOOD

nh-a-pepssi-3-kem1-v4.0/calib/calpars
calpar_columns.fmt

GOOD

nh-a-pepssi-3-kem1-v4.0/calib/calpars
pep_0429861117_0x691_calpar.tab

GOOD

nh-a-pepssi-2-kem1-v4.0/index
nh-a-pepssi-3-kem1-v4.0/index
indxinfo.txt

GOOD

nh-a-pepssi-2-kem1-v4.0/index
nh-a-pepssi-3-kem1-v4.0/index
checksum.lbl & checksum.tab

GOOD

nh-a-pepssi-2-kem1-v4.0/index
nh-a-pepssi-3-kem1-v4.0/index
slimindx.lbl & slimindx.tab

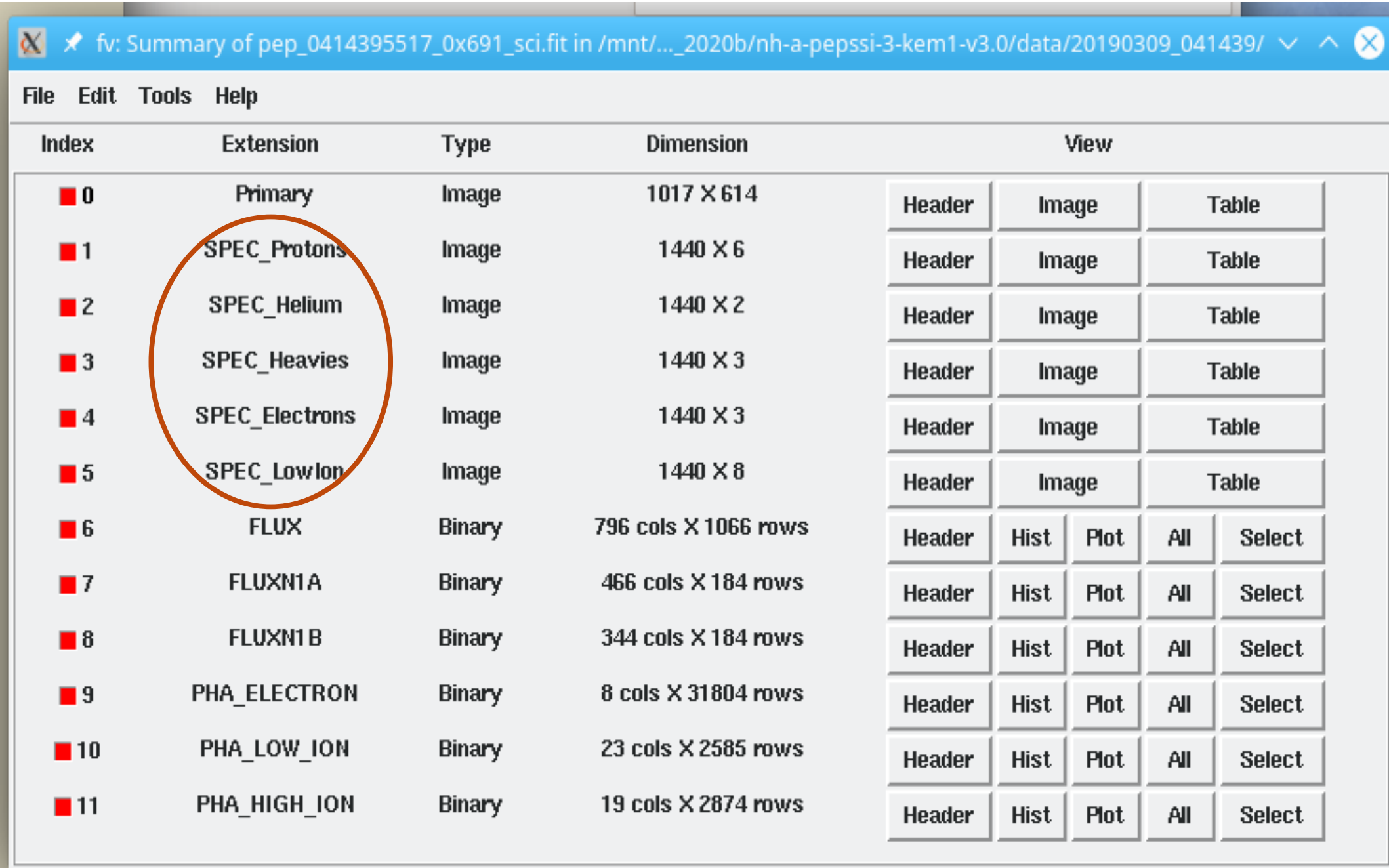
GOOD

nh-a-pepssi-2-kem1-v4.0/index
nh-a-pepssi-3-kem1-v4.0/index
index.lbl & index.tab

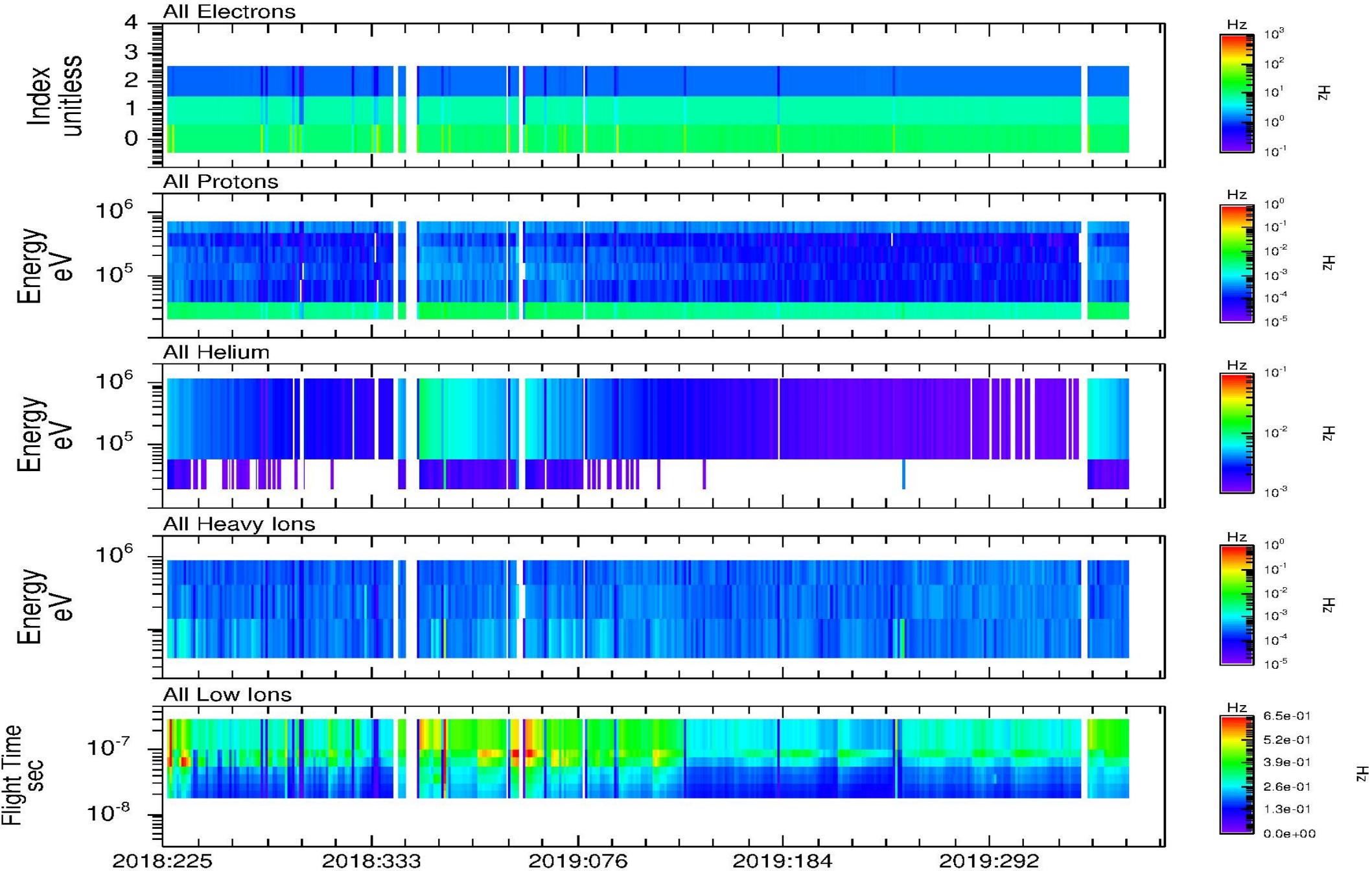
GOOD

Data Evaluation

nh-a-pepssi-3-kem1-v4.0/data
PEPSSI FIT File Structure



nh-a-pepssi-3-kem1-v4.0/data
Quick Look Spectrograms



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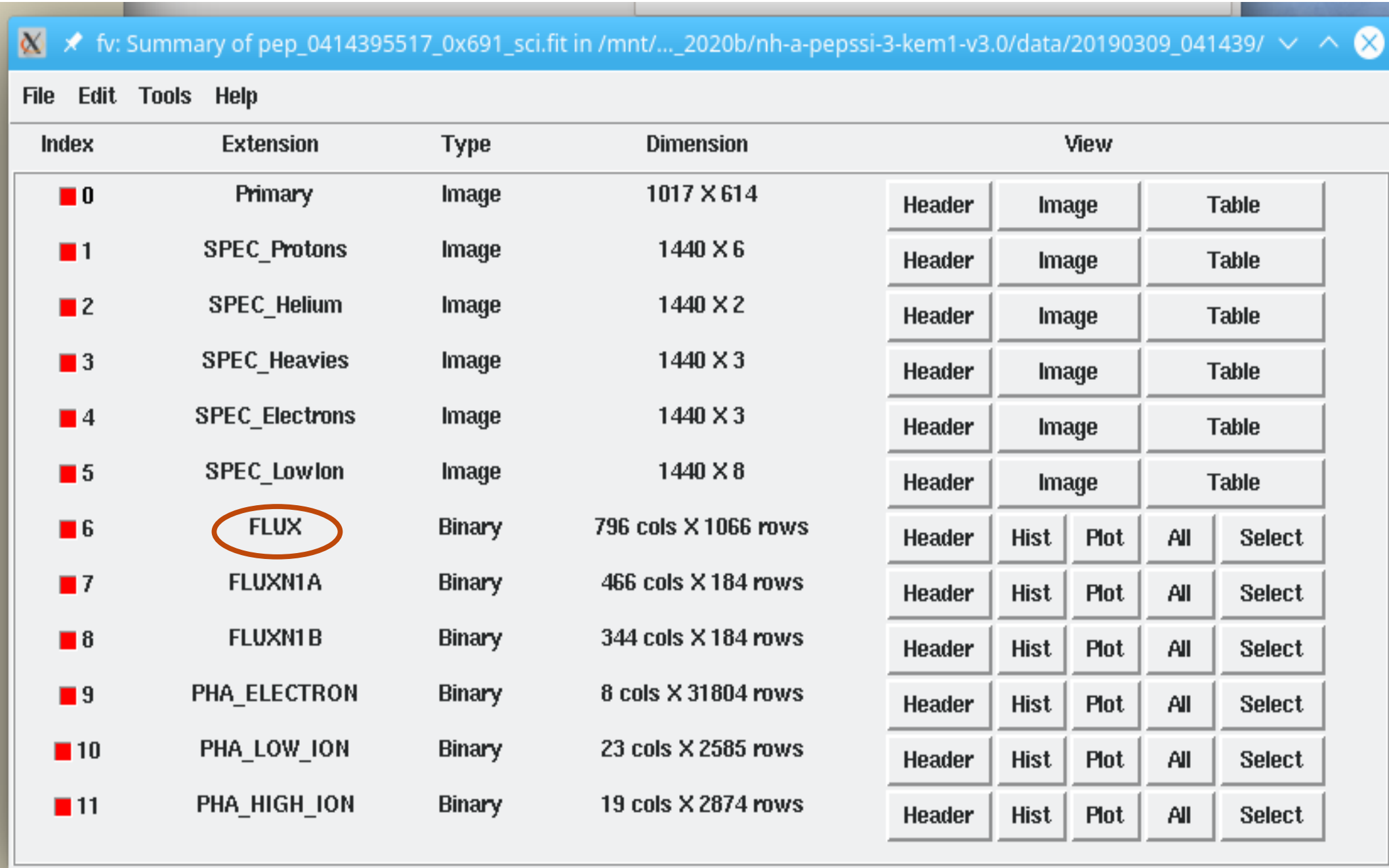
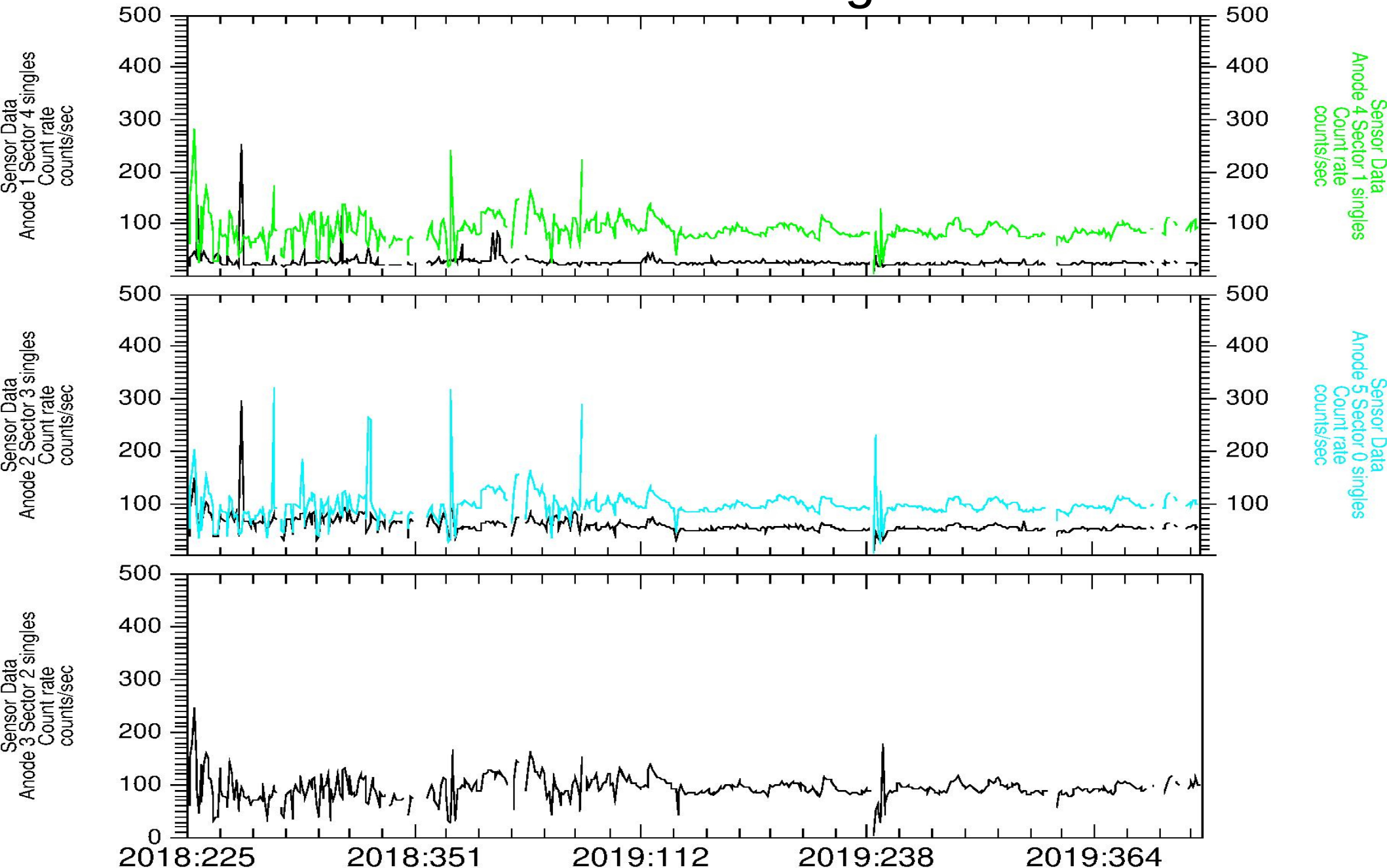
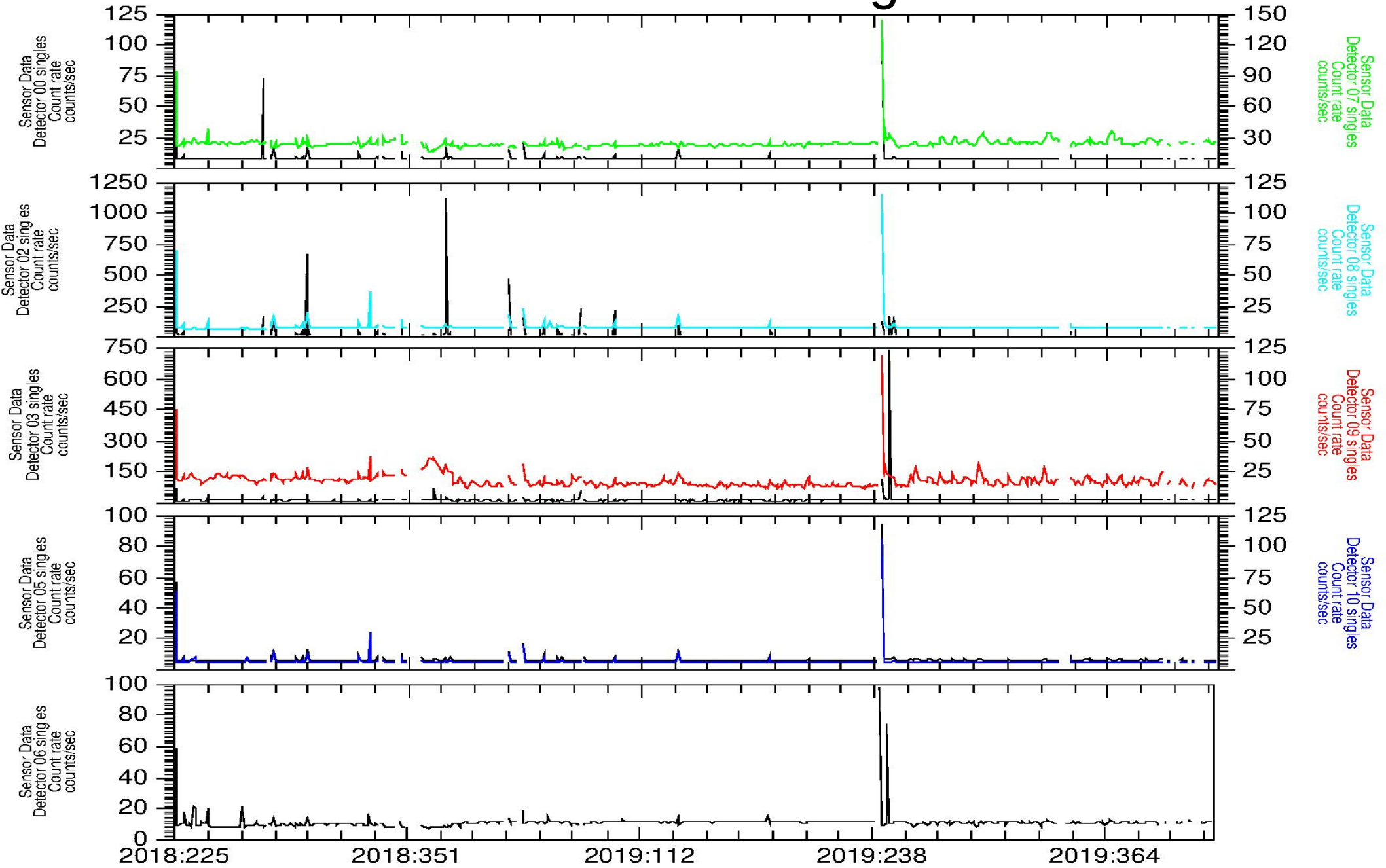
PEPSSI FIT File Structure



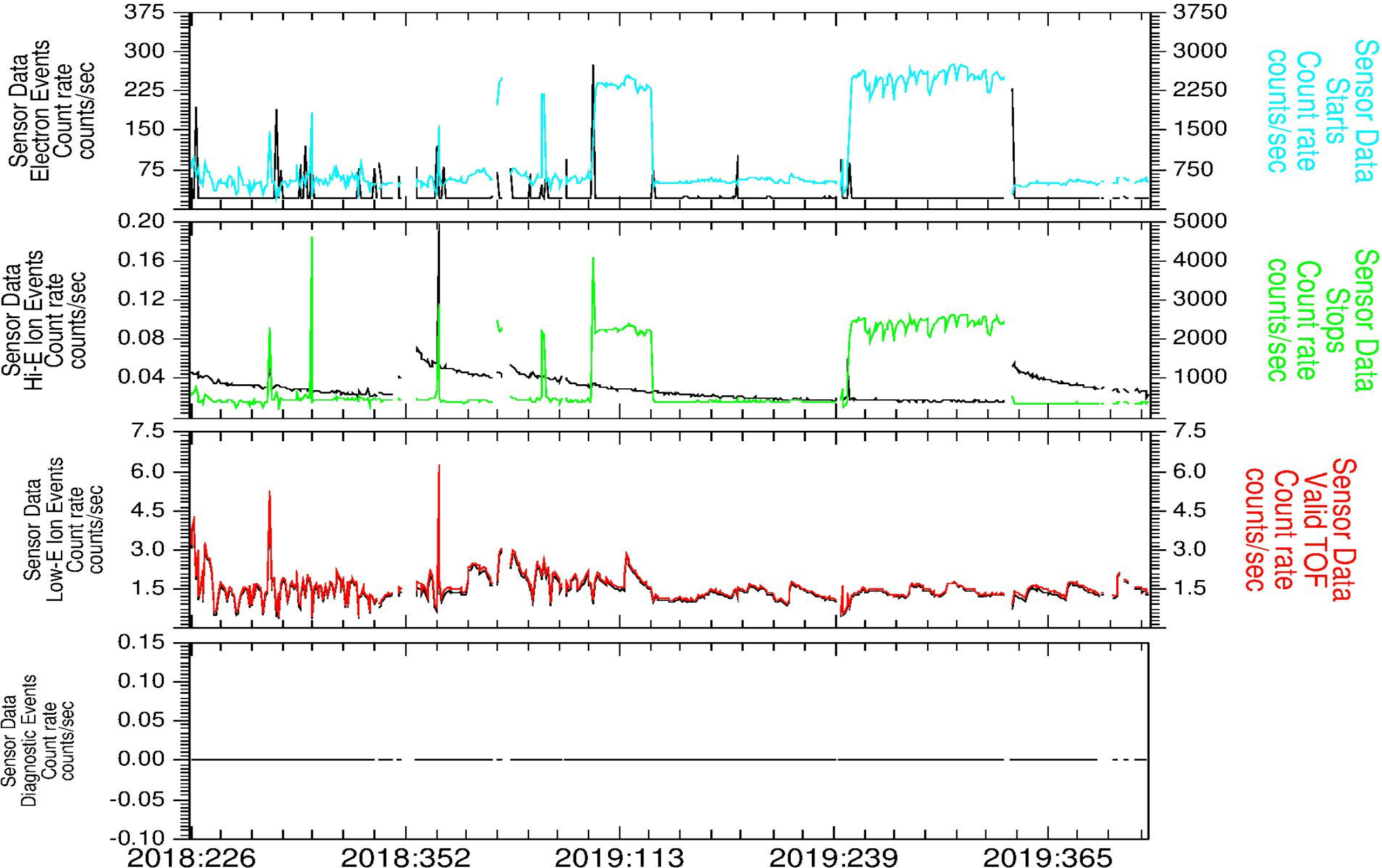
nh-a-pepssi-3-kem1-v4.0/data
FLUX Anode Singles



nh-a-pepssi-3-kem1-v4.0/data
FLUX Detector Singles



nh-a-pepssi-3-kem1-v4.0/data
FLUX Events “C” Rates



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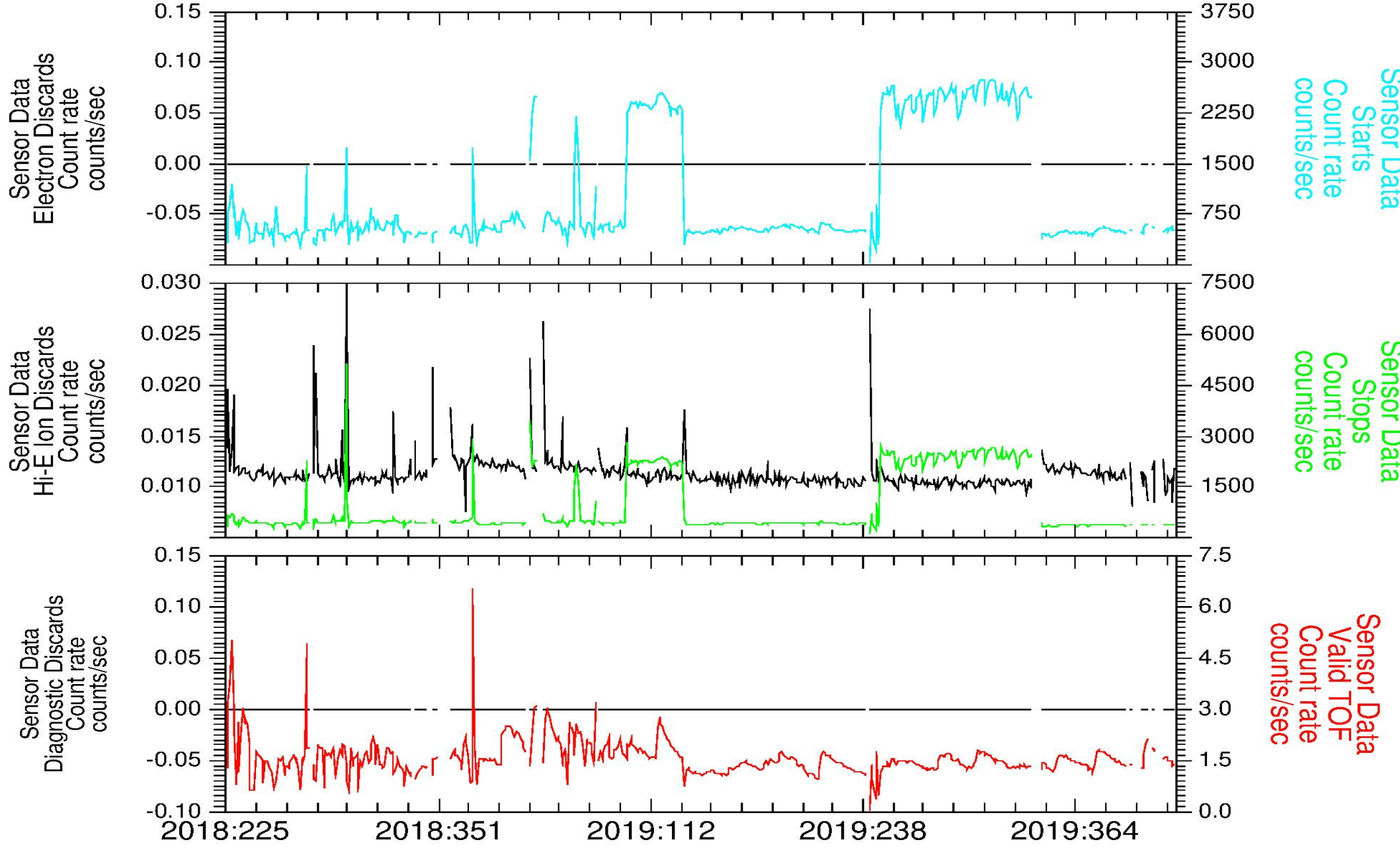
FLUX Discards “J” Rates



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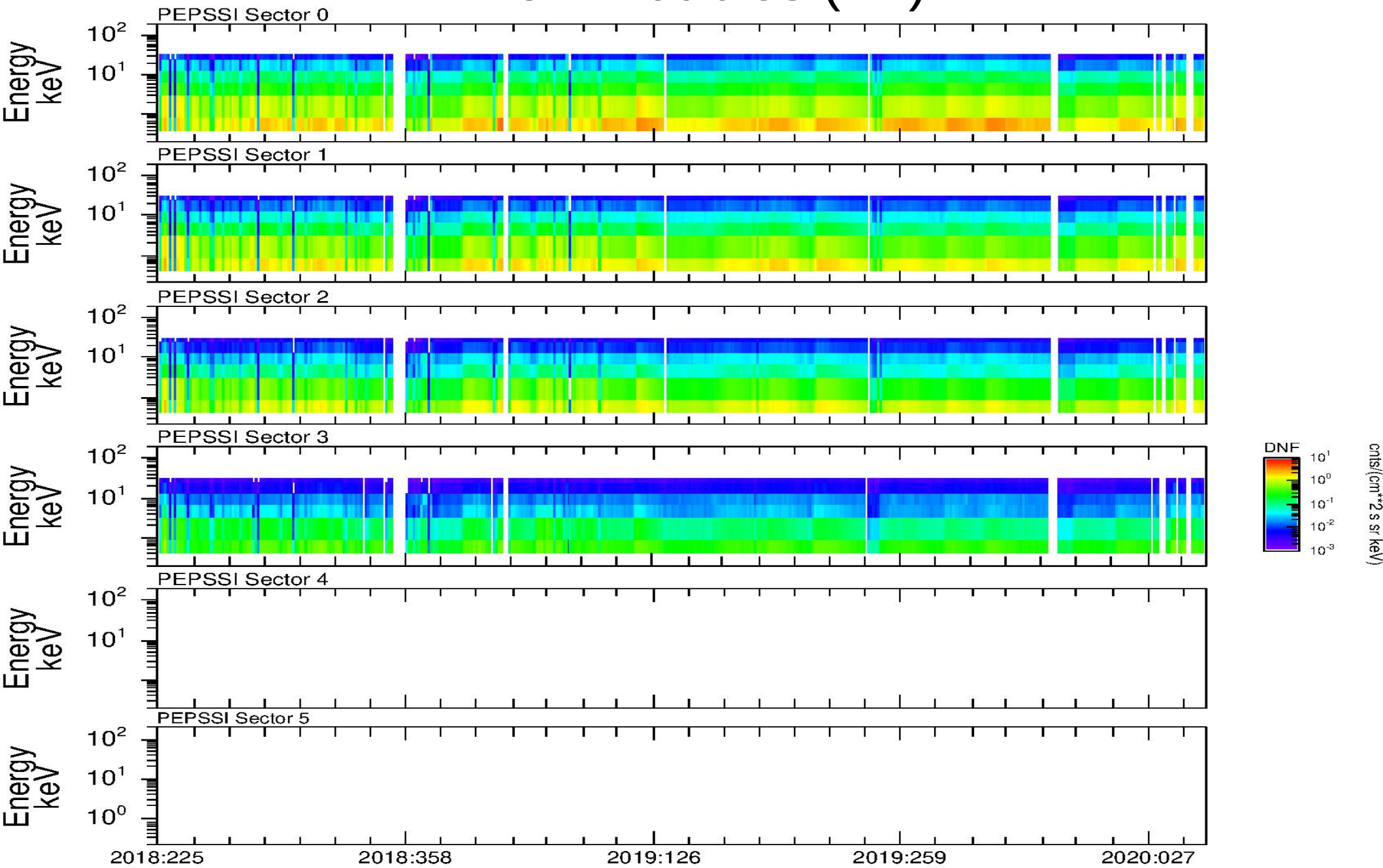
FLUX Doubles (“L”)



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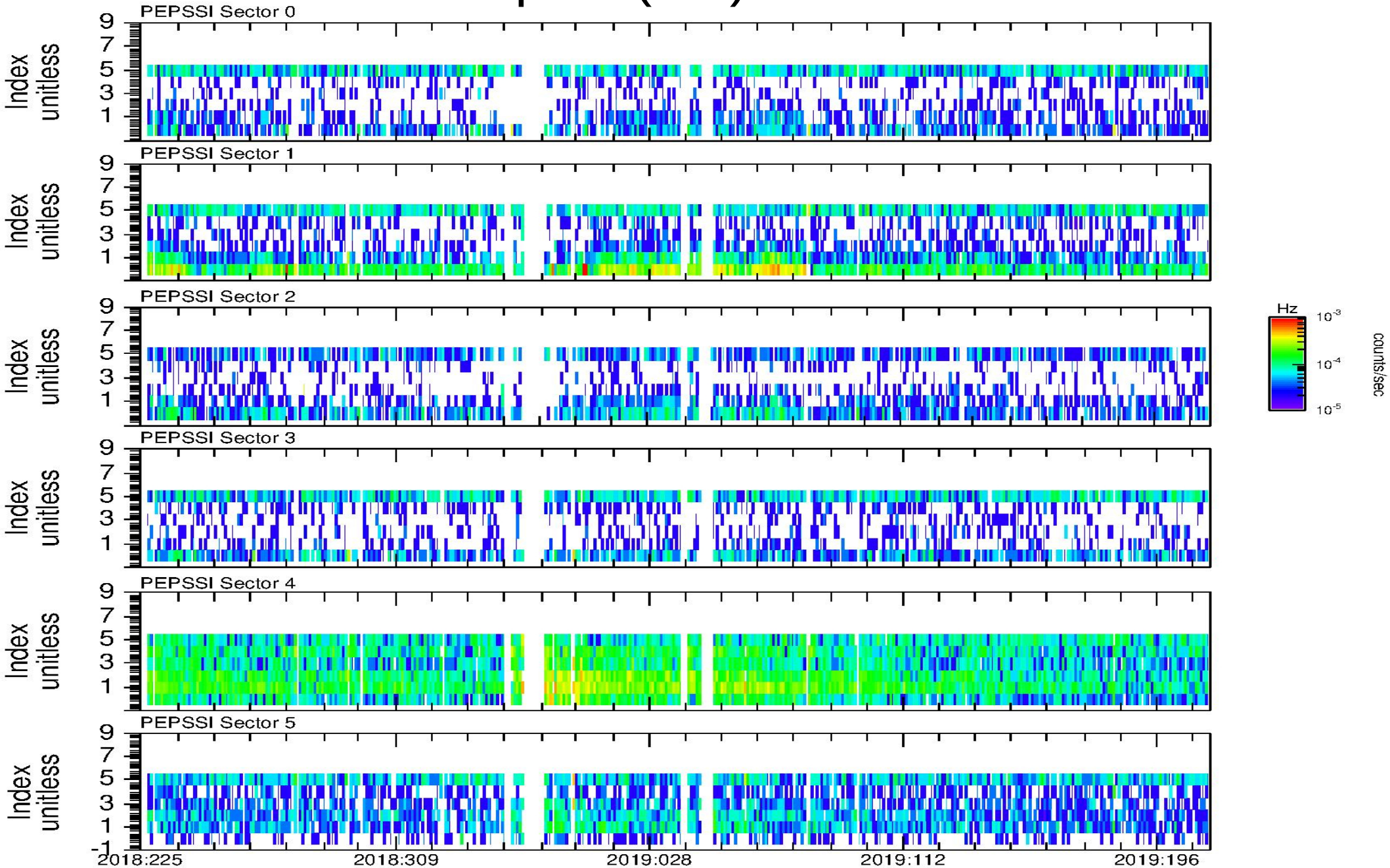
FLUX Triples (“D”) CPS Protons



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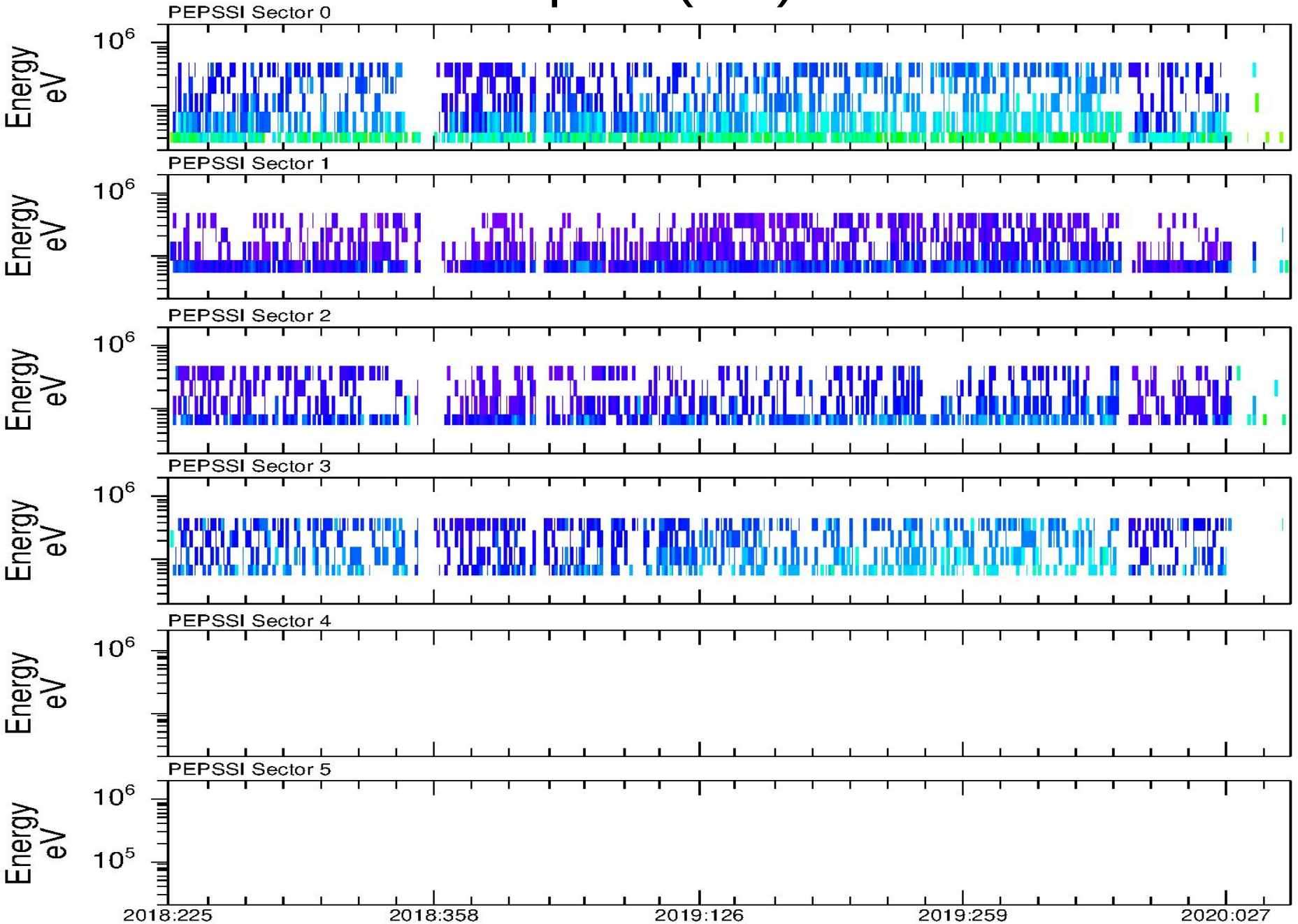
FLUX Triples (“D”) DNF Protons



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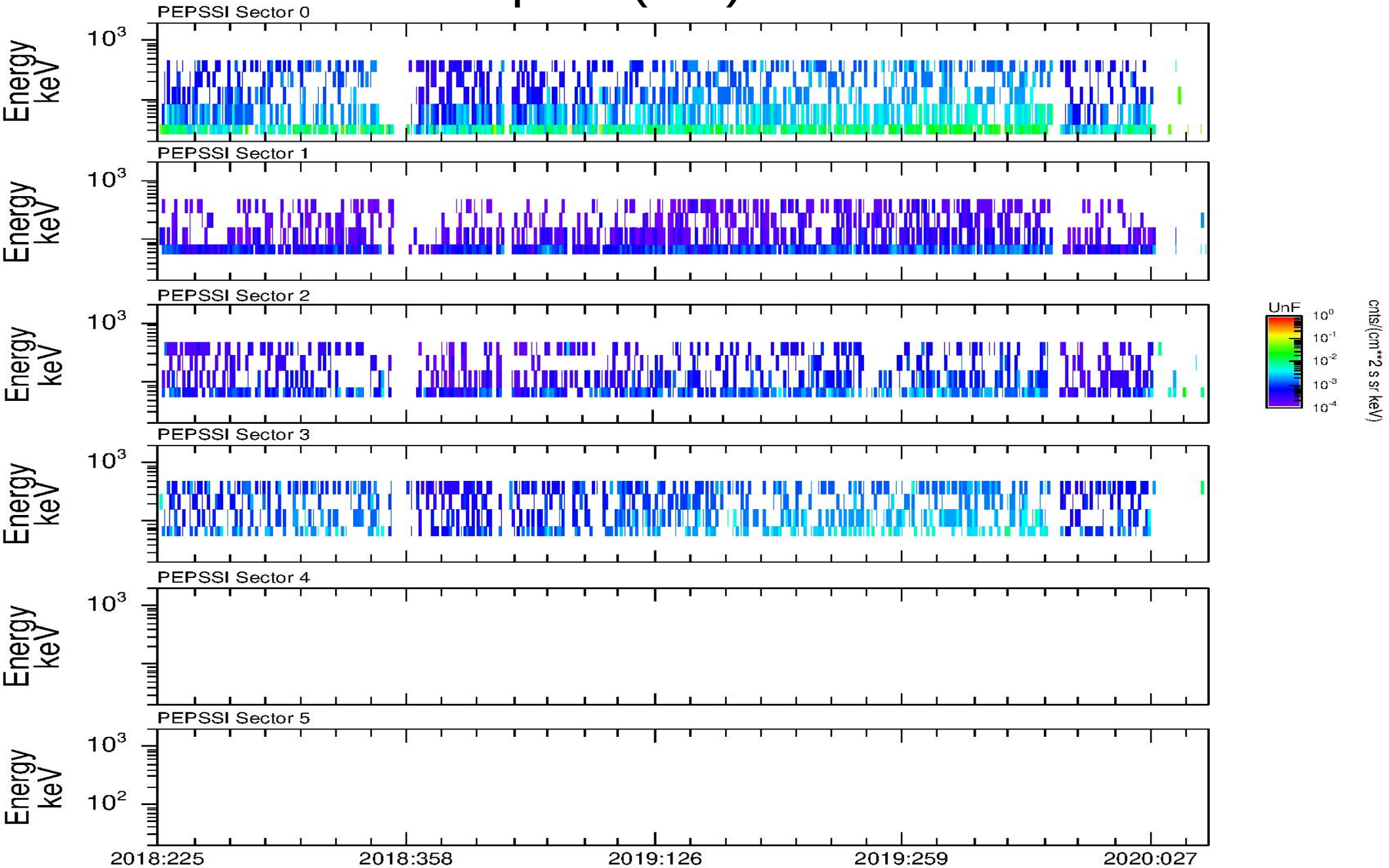
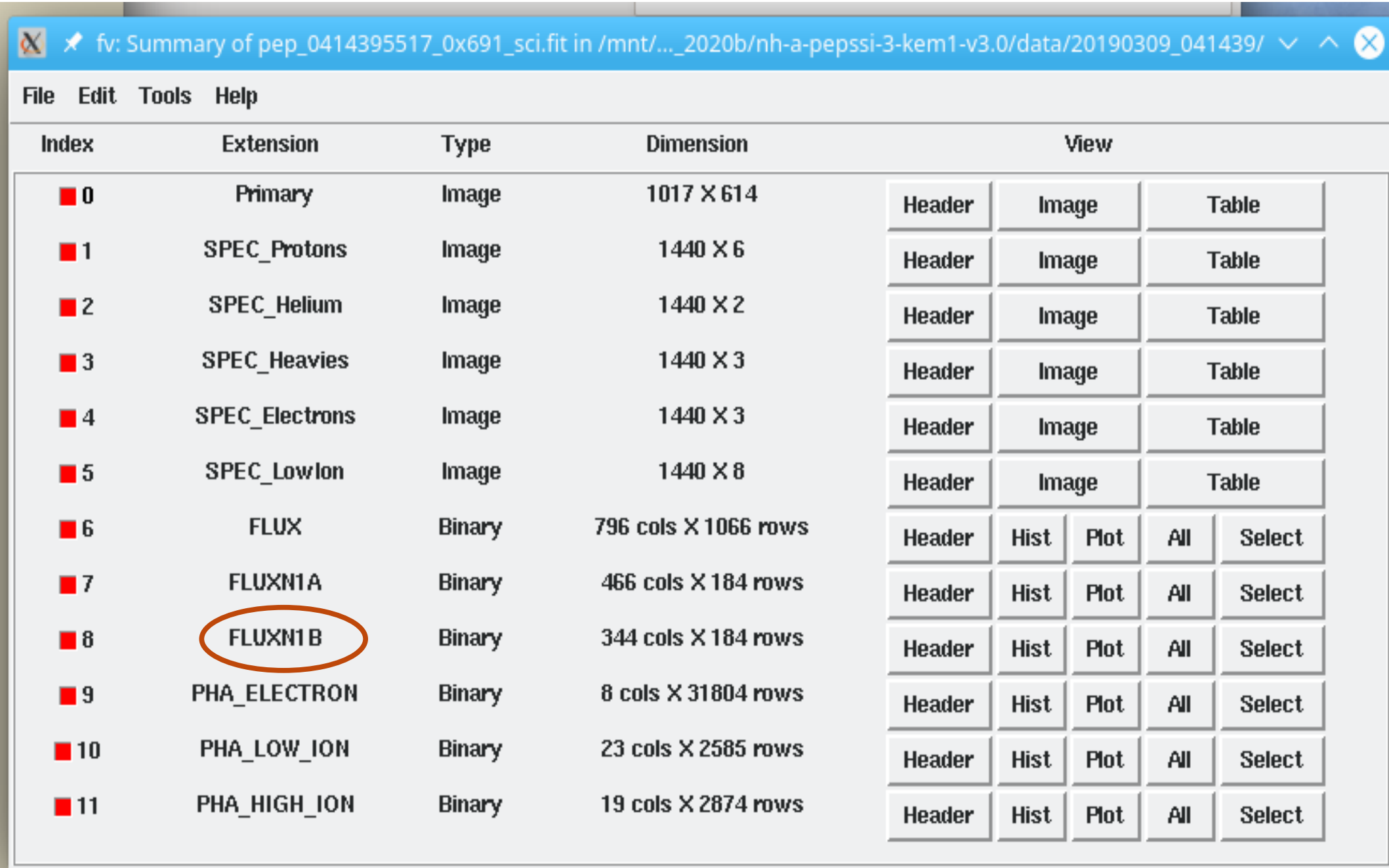
FLUX Triples (“D”) UNC Protons



nh-a-pepssi-3-kem1-v4.0/data
PEPSSI FIT File Structure



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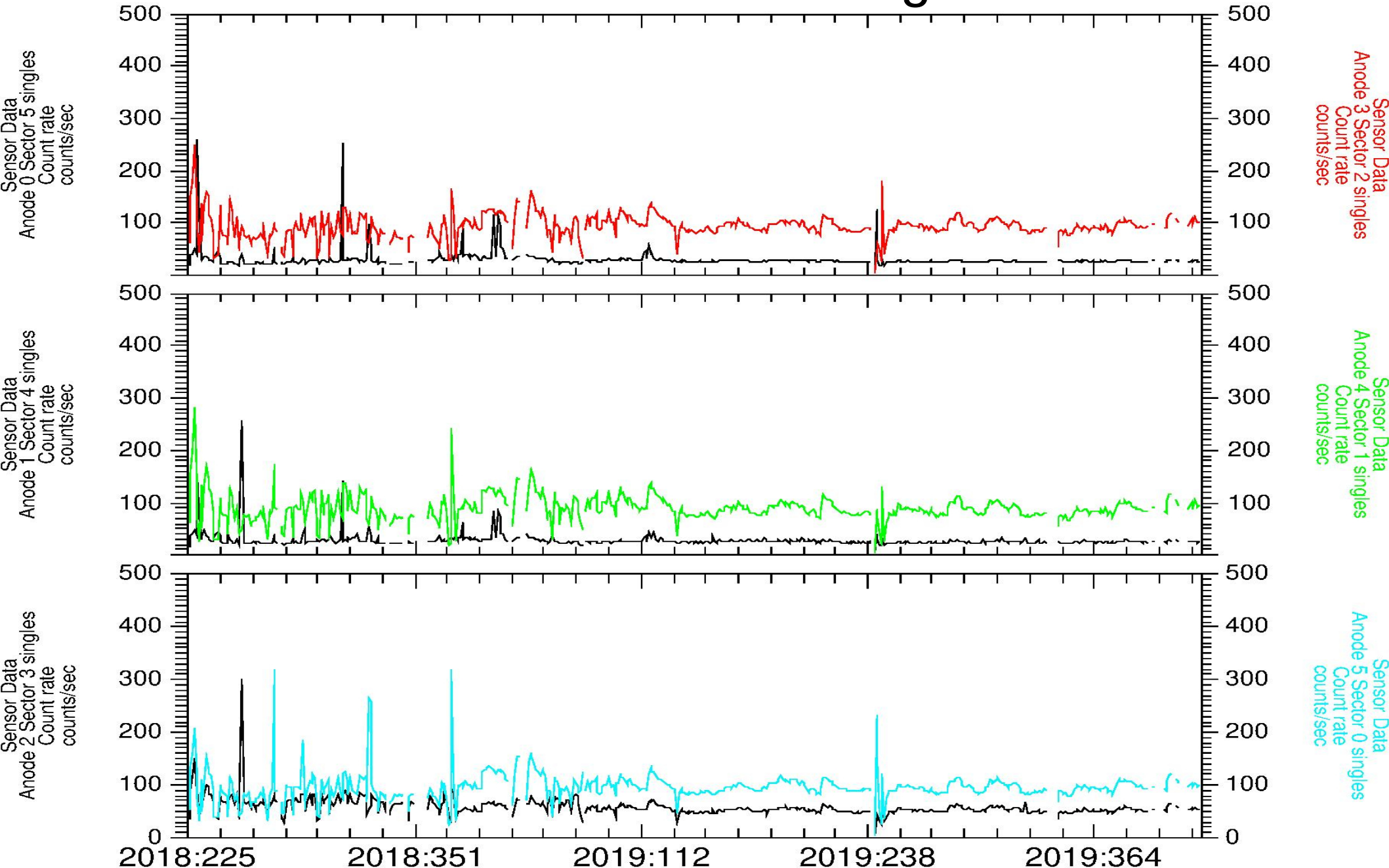
FLUXN1B Anode Singles



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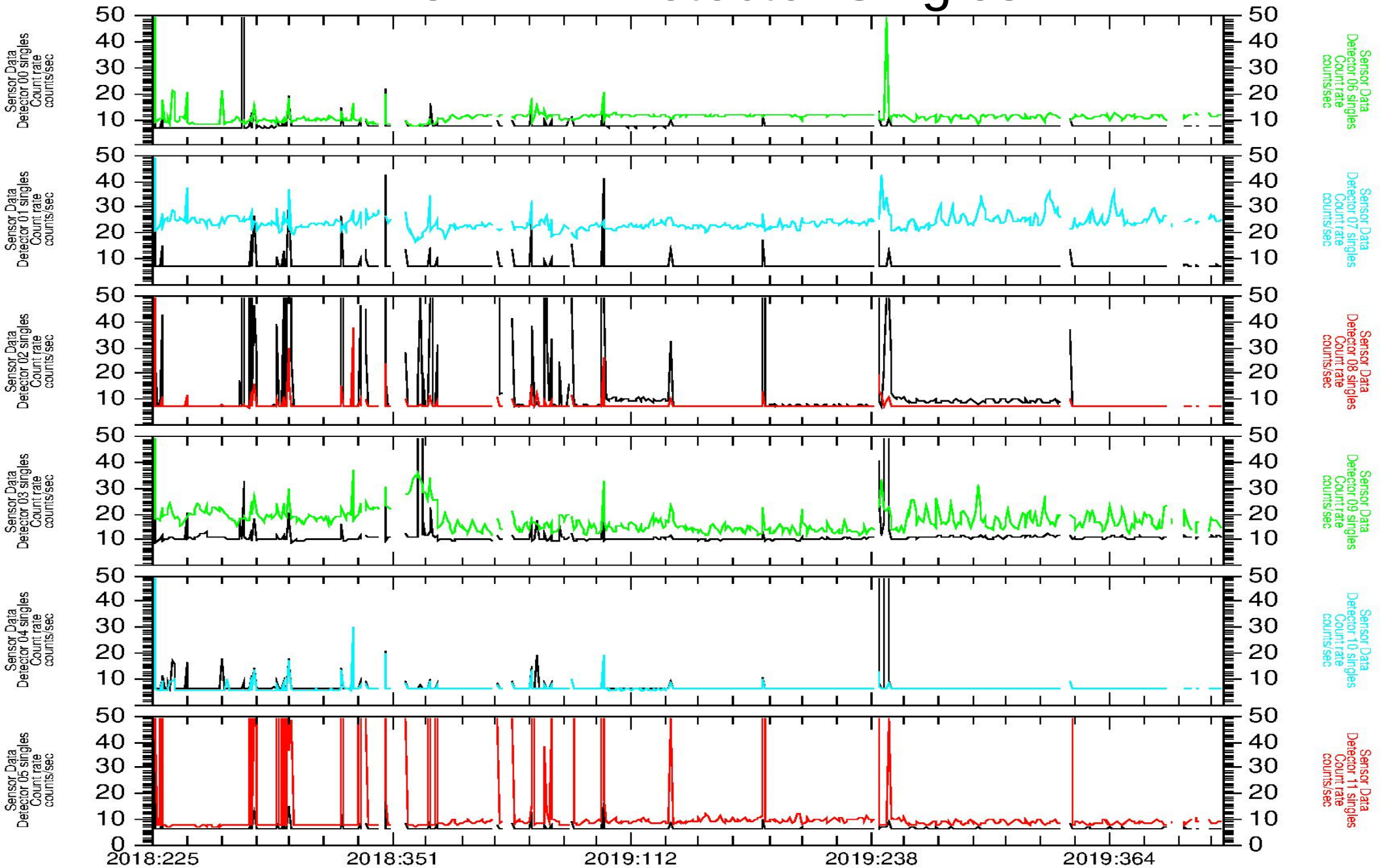
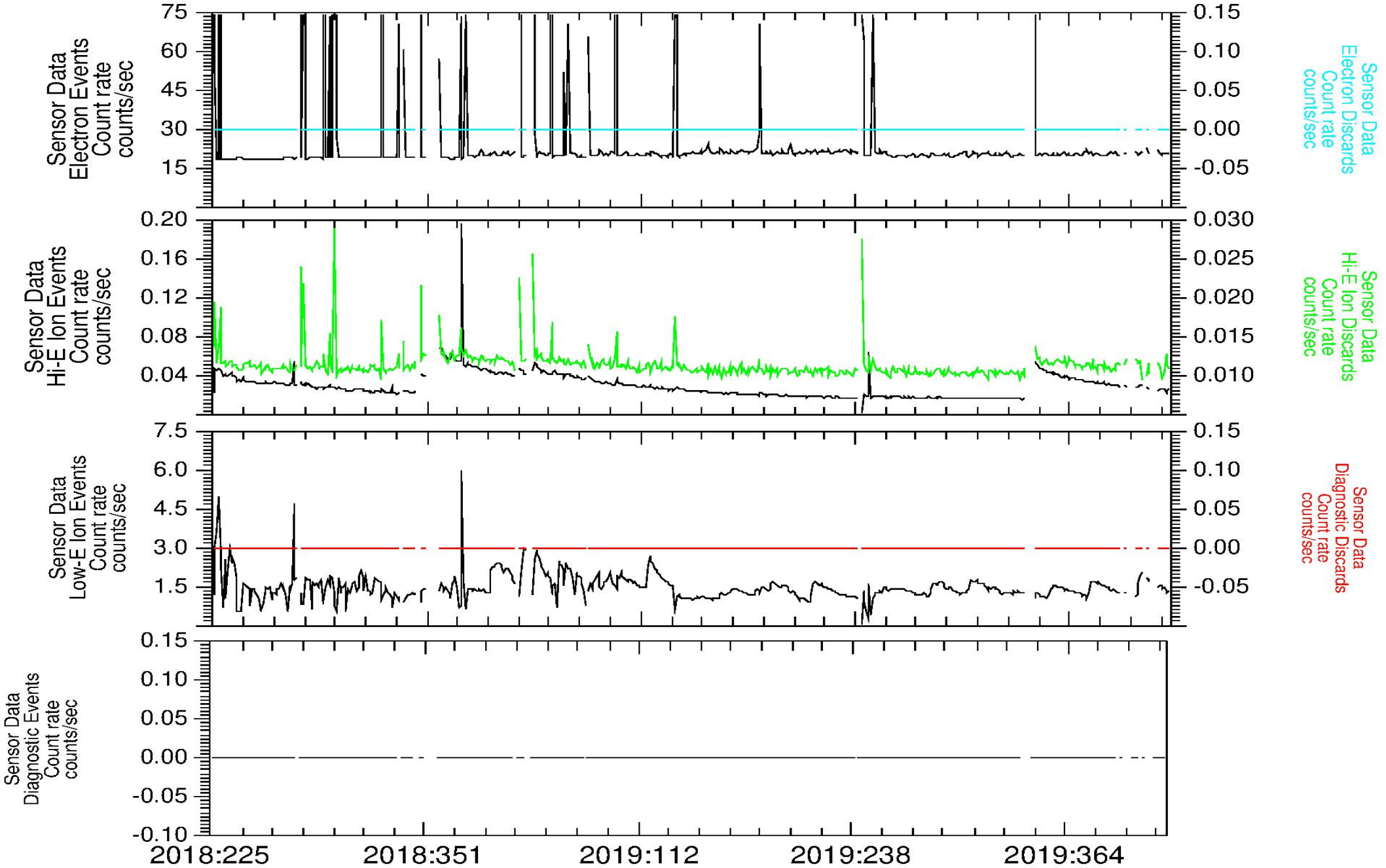
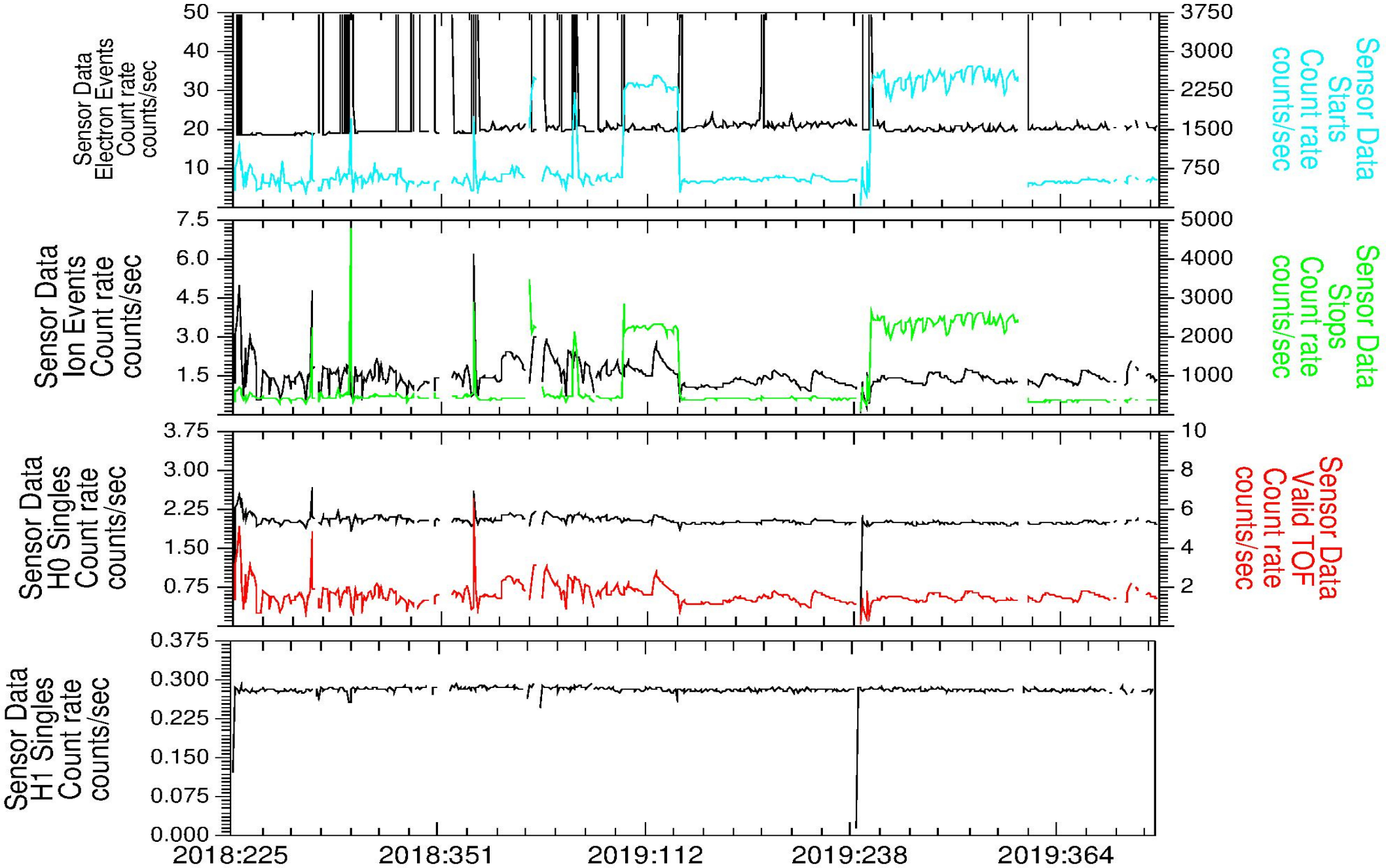
FLUXN1B Detector Singles



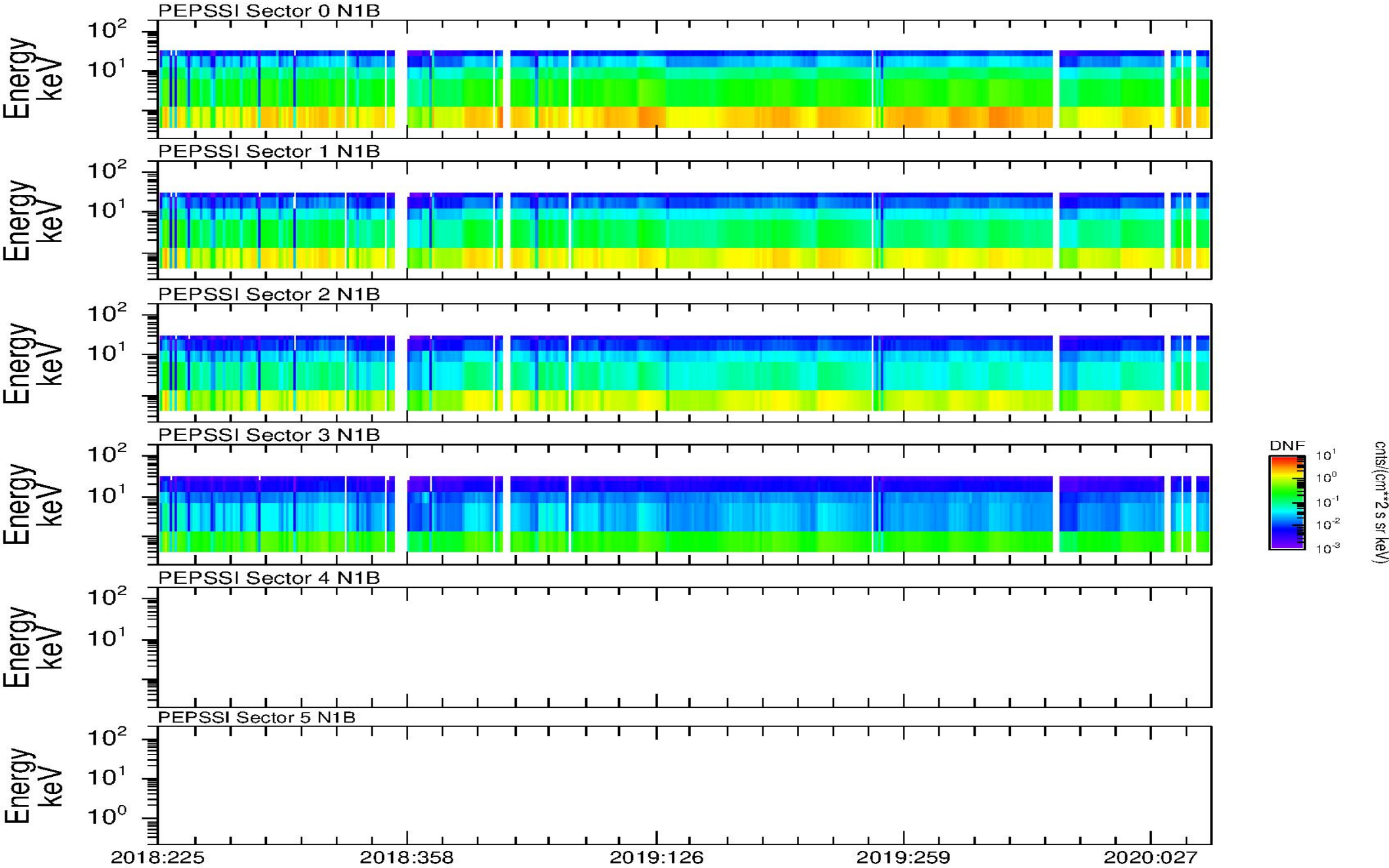
nh-a-pepssi-3-kem1-v4.0/data
FLUXN1B Events & Discards - “J” Rates



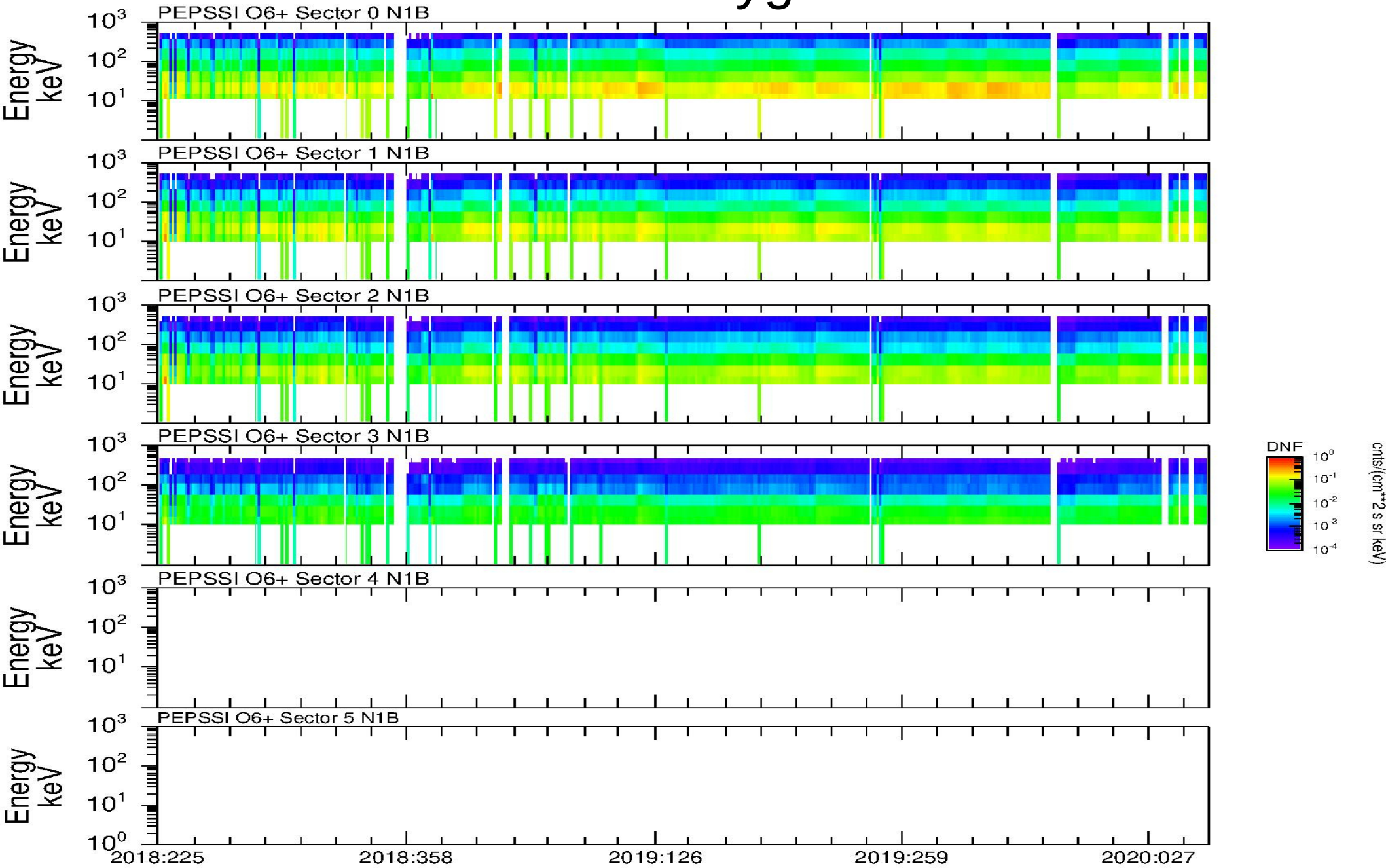
nh-a-pepssi-3-kem1-v4.0/data
FLUXN1B Events - “C” Rates



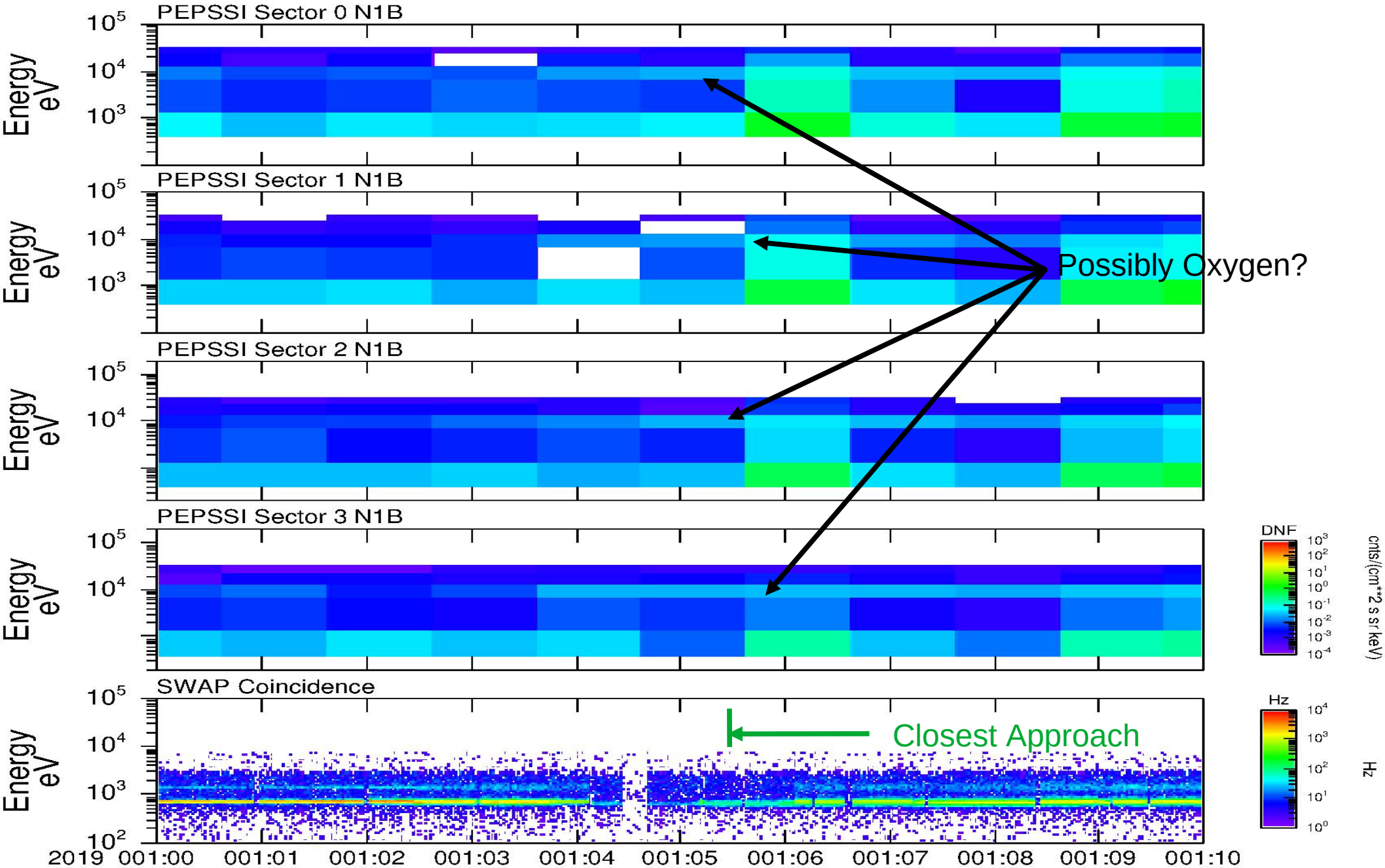
nh-a-pepssi-3-kem1-v4.0/data
FLUXN1B Proton Flux



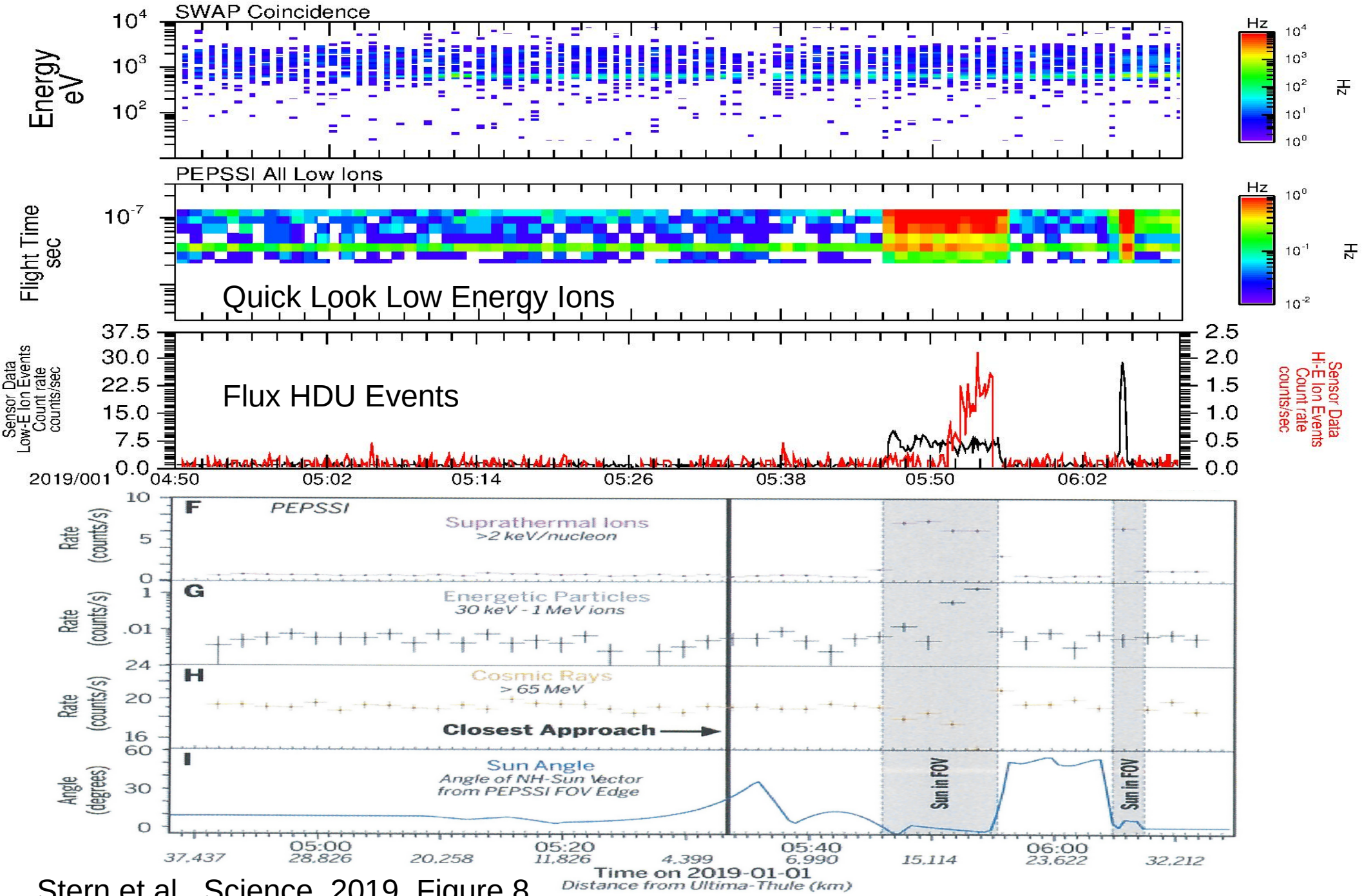
nh-a-pepssi-3-kem1-v4.0/data
FLUXN1B Oxygen Flux



PEPSSI-SWAP
Arrokoth Encounter – 1 of 2



PEPSSI-SWAP Arrokoth Encounter – 2 of 2



Stern et al., Science, 2019, Figure 8

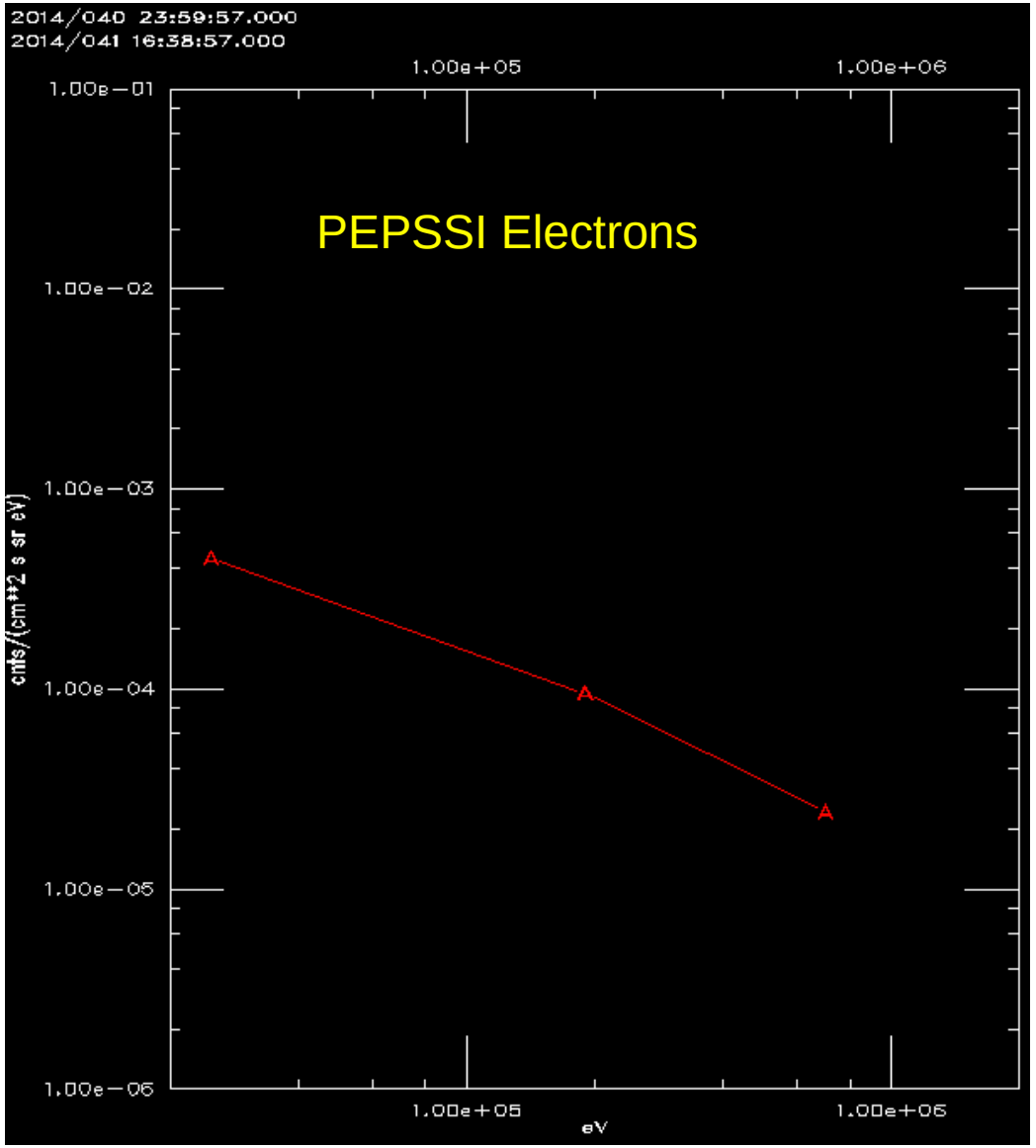
Certification

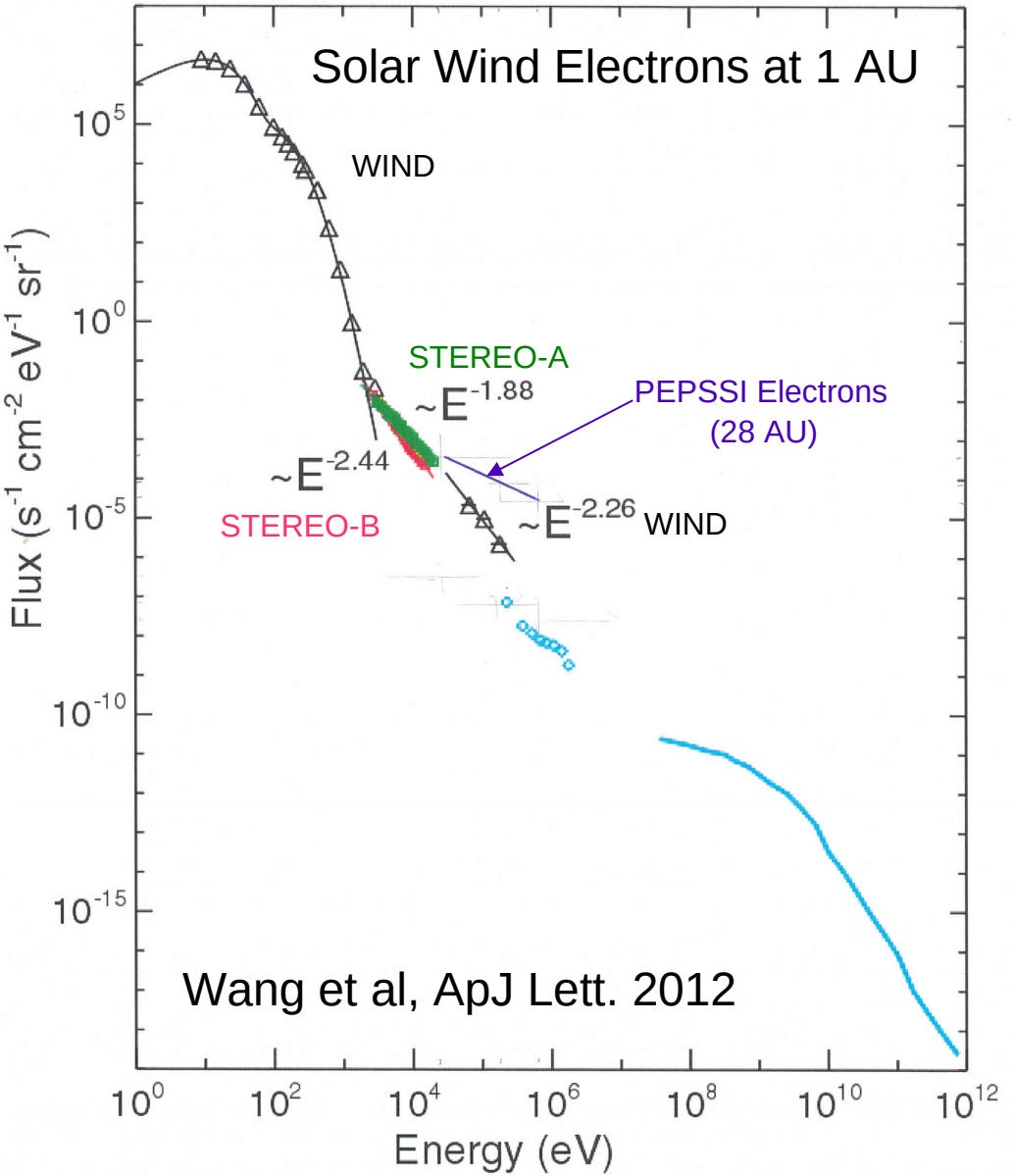
This data can be certified.

BACK-UP Slides

PEPSSI Electrons - 3

Why are the fluxes from PEPSSI abnormally high?





nh-a-pepssi-3-kem1-v3.0/document
soc_inst_icd.lbl

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nh-a-pepssi-3-kem1-v3.0/document
soc_inst_icd.pdf

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