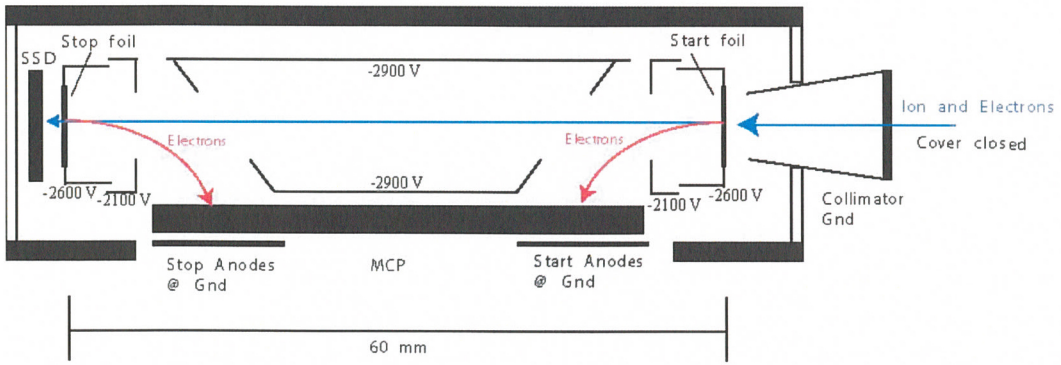
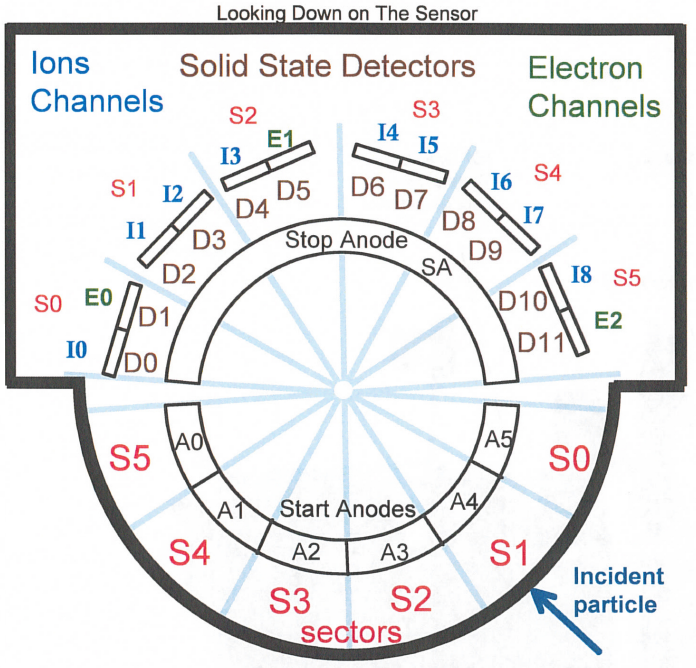
New Horizons Pluto Energetic Particle Spectrometer Science Investigation (PEPSSI)

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-kem2-v1.0

CALIBRATED Data Sets:
nh-a-pepssi-3-kem2-v1.0

New Horizons PEPSSI Data Set Evaluation Tools

Staging and Evaluation -

Machine: Dell Precision Tower 5810

Operating System: Rocky-8 linux

Minor Diagnostics -

Machine: Sun Ultra-60

Operating System: Sun Solaris OS 5.1

Minor Diagnostics -

Machine: Dell 7520

Operating System: Fedora 33 linux

PEPSSI RAW and CALIBRATED Documentation Evaluation

nh-a-pepssi-2-kem2-v1.0
nh-a-pepssi-3-kem2-v1.0
aareadme.txt

GOOD

nh-a-pepssi-2-kem2-v1.0
nh-a-pepssi-3-kem2-v1.0
voldesc.txt

GOOD

nh-a-pepssi-2-kem2-v1.0/catalog
nh-a-pepssi-3-kem2-v1.0/catalog
catinfo.txt

GOOD

nh-a-pepssi-2-kem2-v1.0/catalog
nh-a-pepssi-3-kem2-v1.0/catalog
dataset.cat

GOOD

nh-a-pepssi-2-kem2-v1.0/catalog
nh-a-pepssi-3-kem2-v1.0/catalog
nh_kem.cat

GOOD

nh-a-pepssi-2-kem2-v1.0/catalog
nh-a-pepssi-3-kem2-v1.0/catalog
nh_kem2.cat

GOOD

nh-a-pepssi-2-kem2-v1.0/catalog
nh-a-pepssi-3-kem2-v1.0/catalog
nhsc.cat

GOOD

nh-a-pepssi-2-kem2-v1.0/catalog
nh-a-pepssi-3-kem2-v1.0/catalog
pepssi.cat

GOOD

nh-a-pepssi-2-kem2-v1.0/catalog
nh-a-pepssi-3-kem2-v1.0/catalog
ref.cat

GOOD

nh-a-pepssi-3-kem2-v1.0/document
docinfo.txt

GOOD

nh-a-pepssi-3-kem2-v1.0/document
codmac_level_definitions.lbl
codmac_level_definitions.pdf

GOOD

nh-a-pepssi-3-kem2-v1.0/document
lunineetal1995.lbl & lunineetal1995.pdf

GOOD

nh-a-pepssi-3-kem2-v1.0/document
nh_fov.lbl & nh_fov.pdf

GOOD

nh-a-pepssi-3-kem2-v1.0/document
nh_met2utc.lbl

GOOD

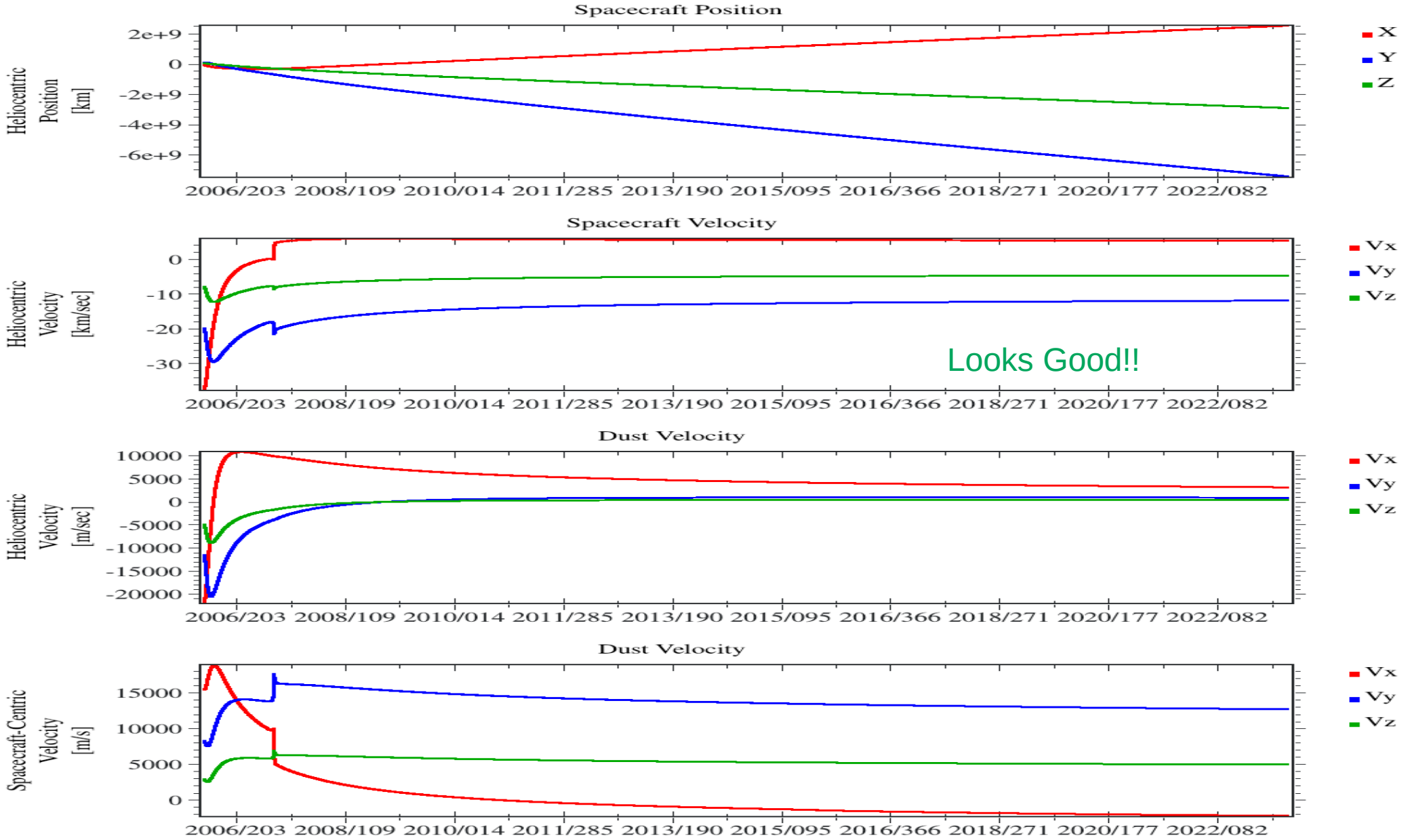
nh-a-pepssi-3-kem2-v1.0/document
nh_met2utc.tab

GOOD, no need to update

nh-a-pepssi-3-kem2-v1.0/document
nh_mission_trajectory.lbl

GOOD

nh-a-pepssi-3-kem2-v1.0/document
nh_mission_trajectory.tab



Plot created by SDDAS/gPlot - J. Mukherjee, et al. Generated on Sat Jan 20 12:42:59 2024.

nh-a-pepssi-3-kem2-v1.0/document
nh_pepssi_v110_ti.txt

GOOD

nh-a-pepssi-3-kem2-v1.0/document
payload_ssr.lbl & payload_ssr.pdf

GOOD

nh-a-pepssi-3-kem2-v1.0/document
pep_bti.lbl

GOOD

nh-a-pepssi-3-kem2-v1.0/document
pep_bti.tab

***** WARNING *****
Start and End reflect the same time
At: 2007-022T21:00:00.0000
At: 2007-040T09:00:00.0000
At: 2007-144T13:03:00.0000
At: 2015-212T00:40:00.0000
At: 2015-212T00:40:00.0000
At: 2015-213T06:45:00.0000
At: 2015-213T06:45:00.0000
point skipped

nh-a-pepssi-3-kem2-v1.0/document
pepssi_ssr.lbl & pepssi_ssr.pdf

GOOD

nh-a-pepssi-3-kem2-v1.0/document
quat_axyz_instr_to_j2k.lbl
quat_axyz_instr_to_j2k.asc

GOOD

nh-a-pepssi-3-kem2-v1.0/document
seq_pepssi_kem1.lbl

GOOD

nh-a-pepssi-3-kem2-v1.0/document
seq_pepssi_kem1.tab

GOOD, updated

nh-a-pepssi-3-kem2-v1.0/document
seq_pepssi_kem2.lbl & seq_pepssi_kem2.tab

GOOD

nh-a-pepssi-2-kem2-v1.0/document superseded_files_pepssi-2.lbl & superseded_files_pepssi-2.tab

GOOD

nh-a-pepssi-3-kem2-v1.0/document superseded_files_pepssi-3.lbl & superseded_files_pepssi-3.tab

GOOD

nh-a-pepssi-3-kem2-v1.0/document
soc_inst_icd.lbl

GOOD

nh-a-pepssi-3-kem2-v1.0/document
soc_inst_icd.pdf

GOOD

nh-a-pepssi-3-kem2-v1.0/calib
calinfo.txt

GOOD

nh-a-pepssi-3-kem2-v1.0/calib
hk_n1_input_20050228.lbl
hk_n1_input_20050228.tab

GOOD

nh-a-pepssi-3-kem2-v1.0/calib
hk_stat_input_20041016.lbl
hk_stat_input_20041016.tab

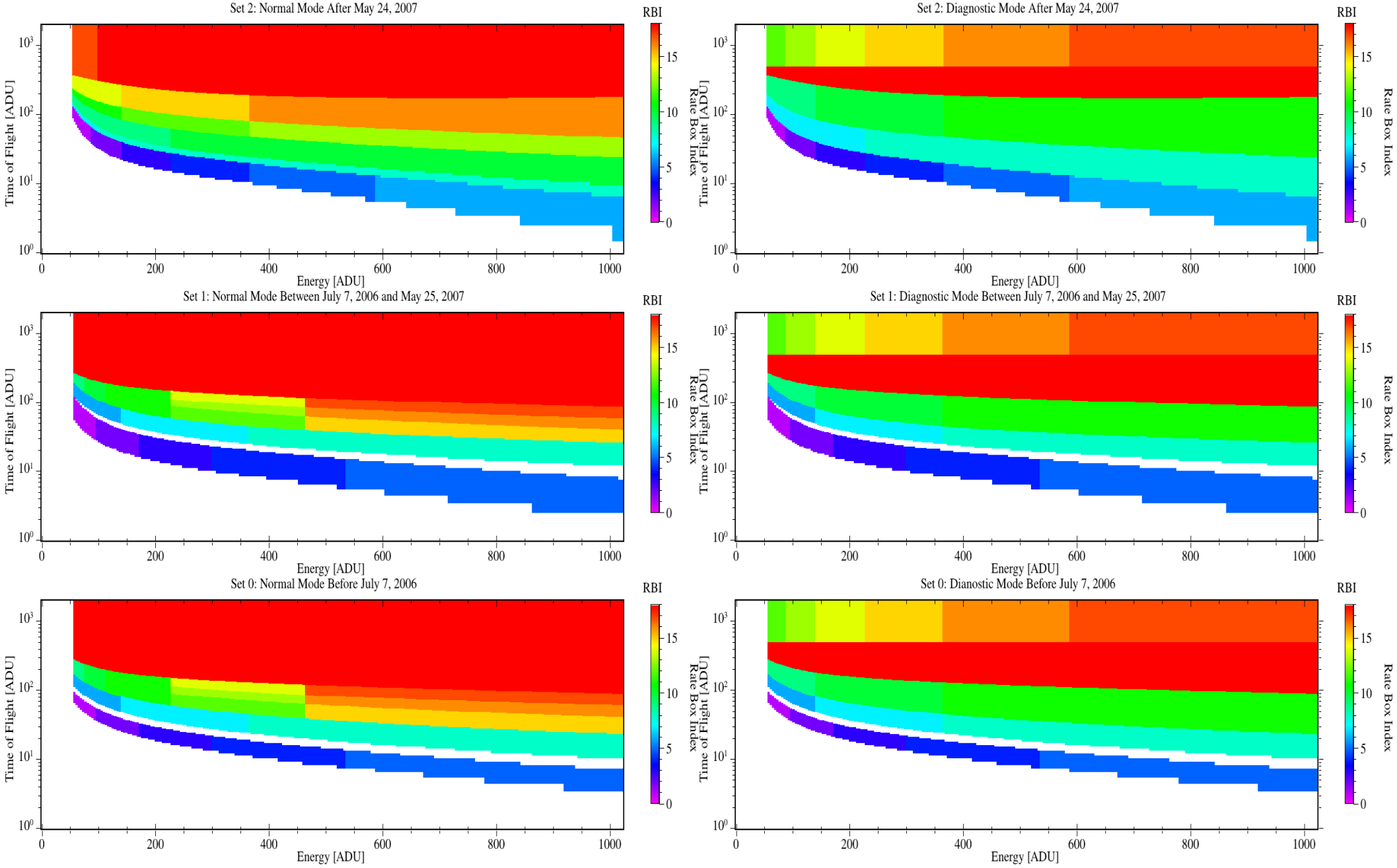
GOOD

nh-a-pepssi-3-kem2-v1.0/calib
rateboxdefinitionplanes.lbl

GOOD

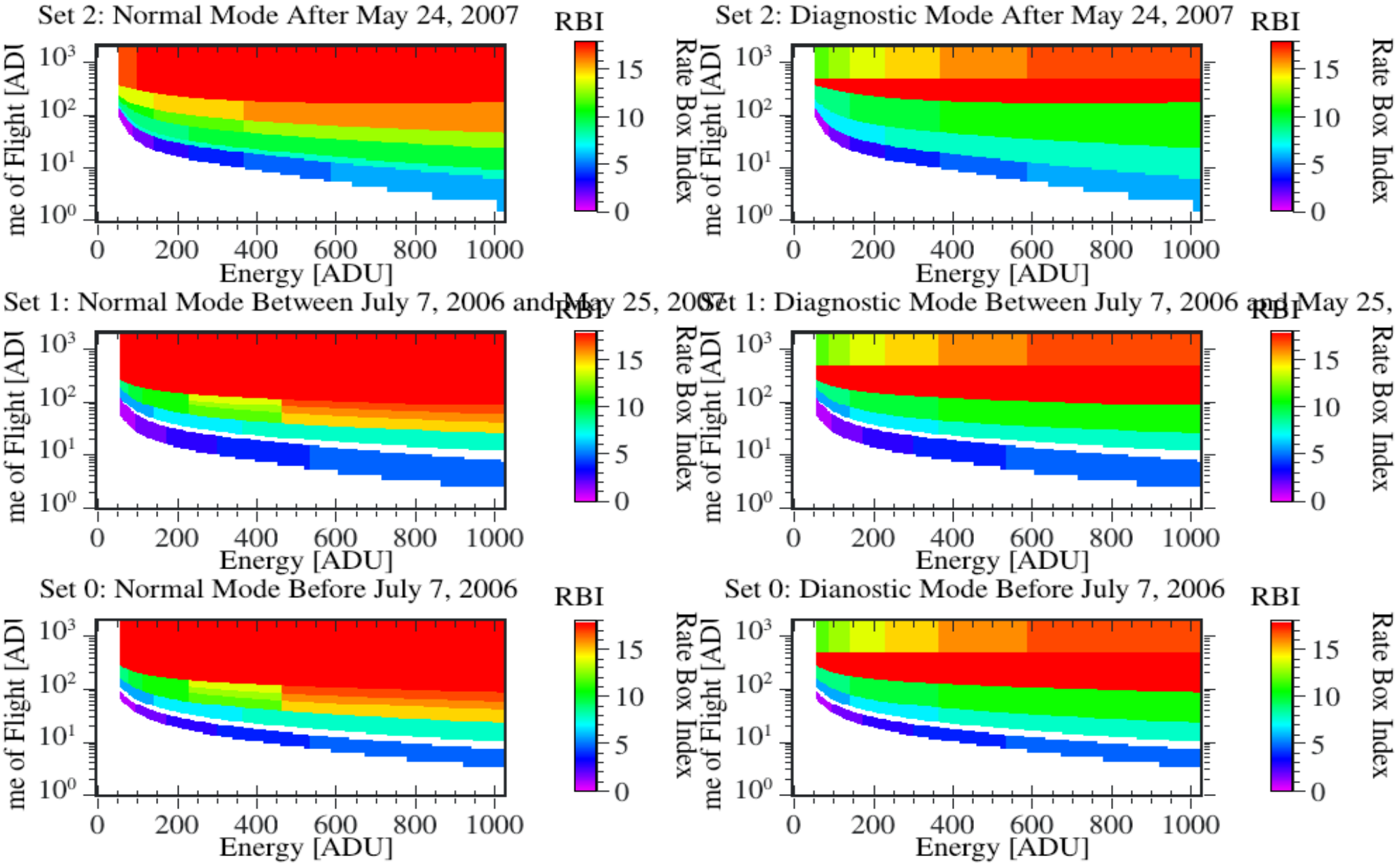
nh-a-pepssi-3-kem1-v6.0/calib rateboxdefinitionplanes.fit

Looks Good!!



Looks Good!!

nh-a-pepssi-3-kem2-v1.0/calib
rateboxdefinitionplanes.fit



Plot created by SDDAS/gPlot - J. Mukherjee, et al. Generated on Sat Jan 20 13:22:24 2024.

nh-a-pepssi-3-kem2-v1.0/calib/calpars
calpinfo.txt

GOOD

nh-a-pepssi-3-kem2-v1.0/calib/calpars
calpar_columns.fmt

GOOD

nh-a-pepssi-3-kem2-v1.0/calib/calpars
pep_0542785916_0x691_calpar.tab

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INSTRUMENT_HOST_NAME        = "NEW HORIZONS"
DATA_SET_ID                 = "NH-A-PEPSSI-3-KEM2-V1.0"
PRODUCT_ID                  = "PEP_0542785916_0X691_CALPAR"
PRODUCER_INSTITUTION_NAME   = "SOUTHWEST RESEARCH INSTITUTE"
PRODUCT_CREATION_TIME       = 2023-08-01T00:00:00
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Should the Mission name be:
"NEW HORIZONS KUIPER BELT EXTENDED MISSION 2"

nh-a-pepssi-3-kem2-v1.0/index
indxinfo.txt

GOOD

nh-a-pepssi-3-kem2-v1.0/index

checksum.lbl & checksum.tab

GOOD

nh-a-pepssi-3-kem2-v1.0/index
slimindx.lbl & slimindx.tab

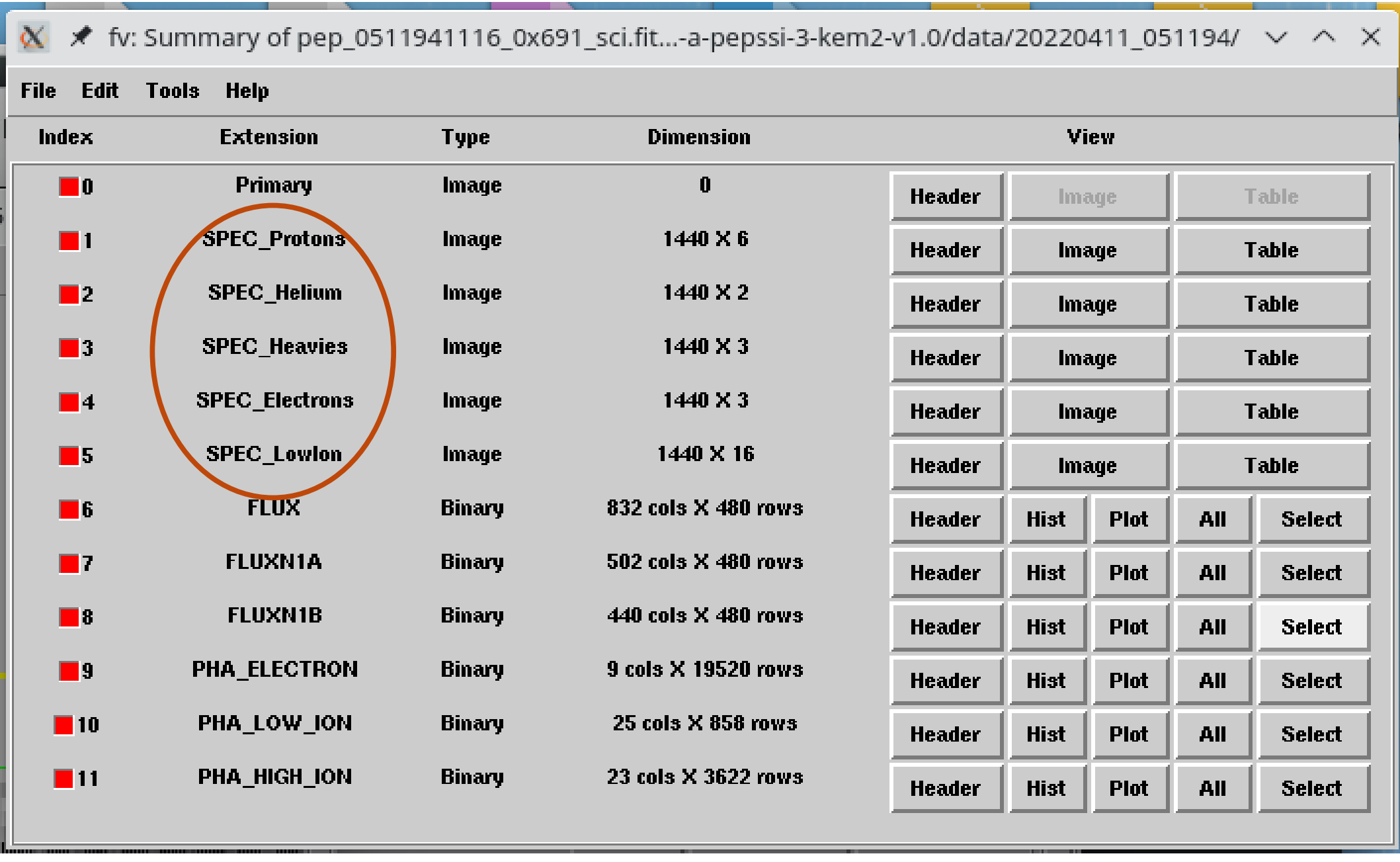
GOOD

nh-a-pepssi-3-kem2-v1.0/index
index.lbl & index.tab

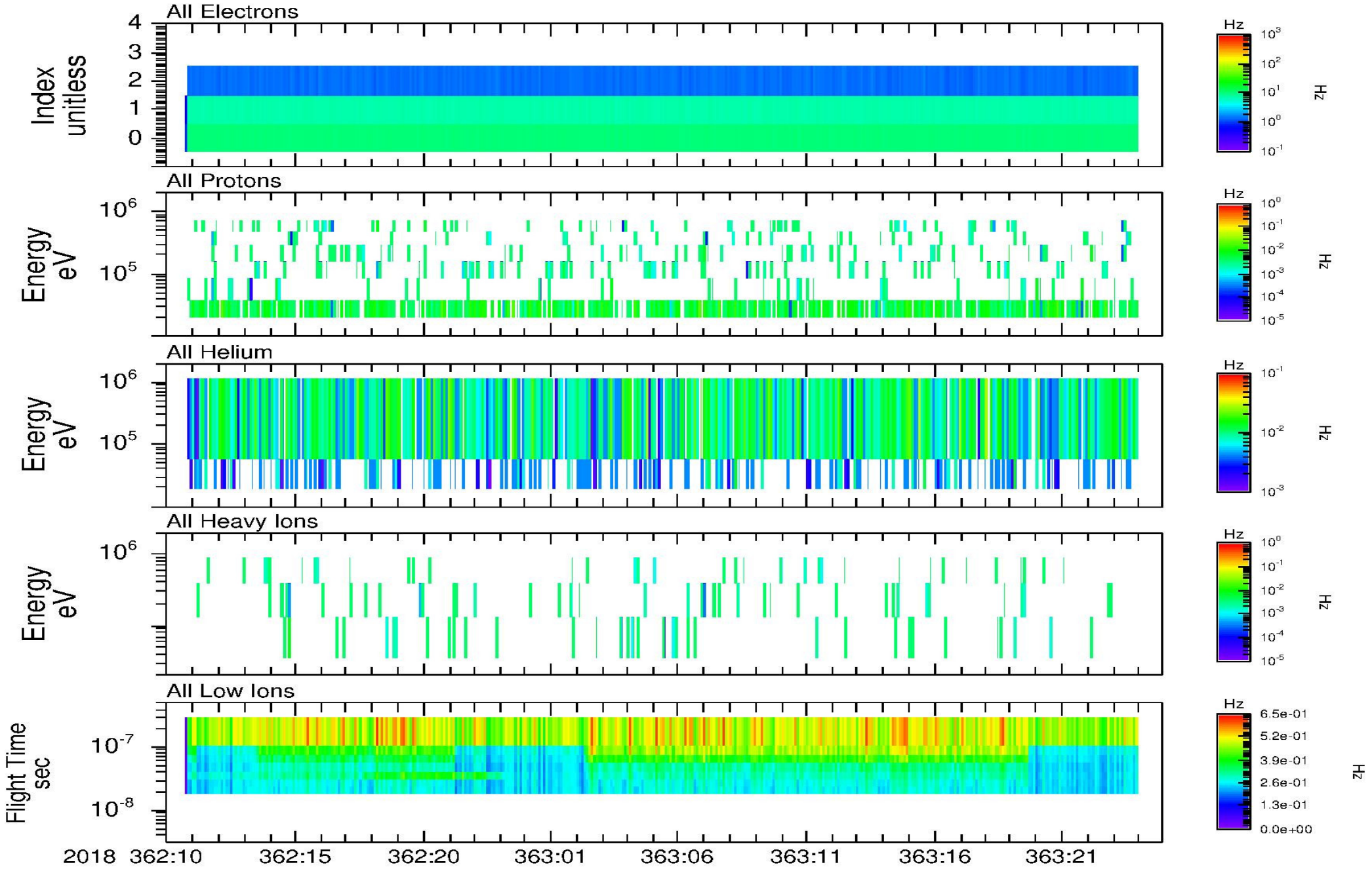
GOOD

PEPSSI RAW and CALIBRATED Data Evaluation

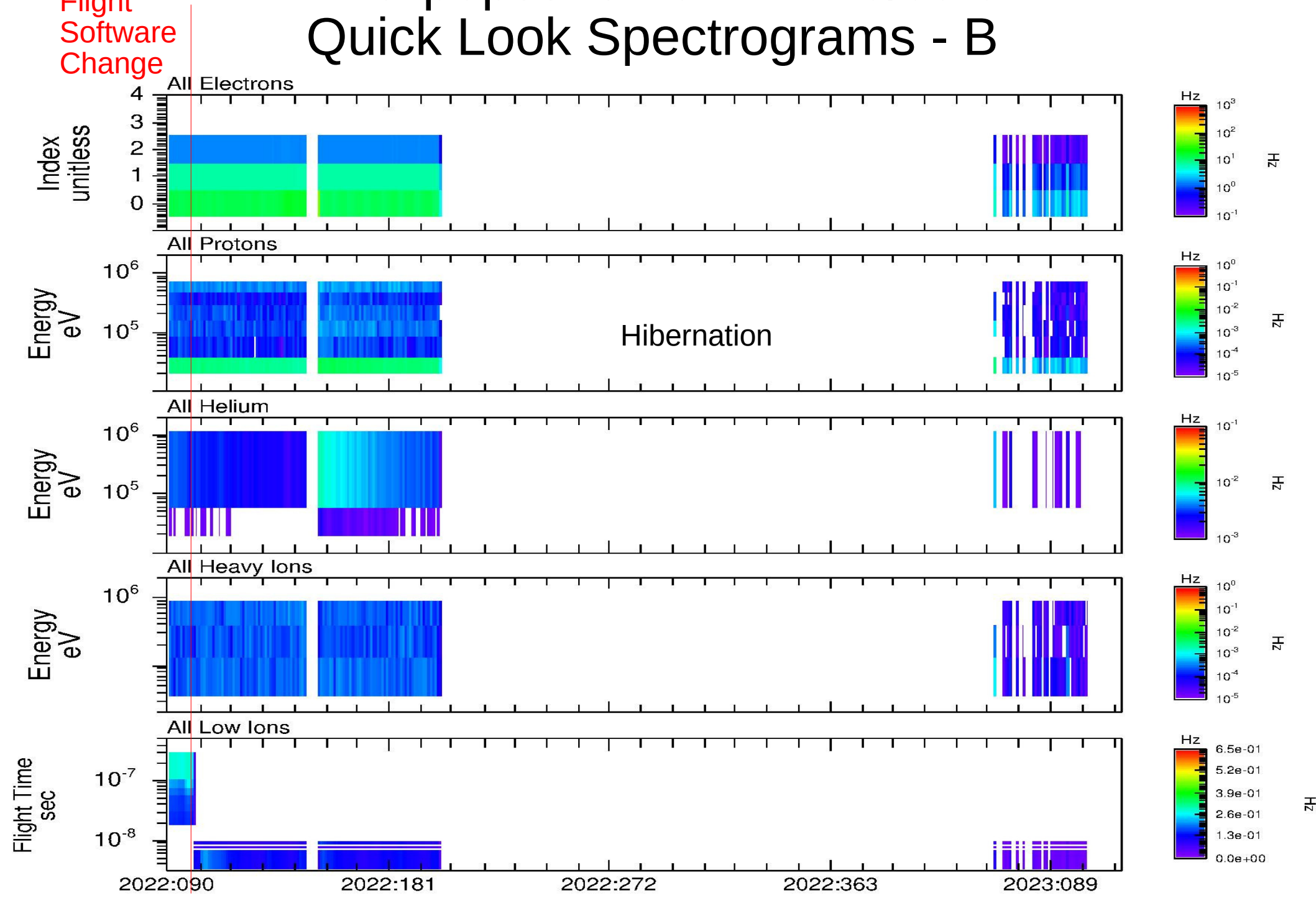
nh-a-pepssi-3-kem2-v1.0/data
PEPSSI FIT File Structure



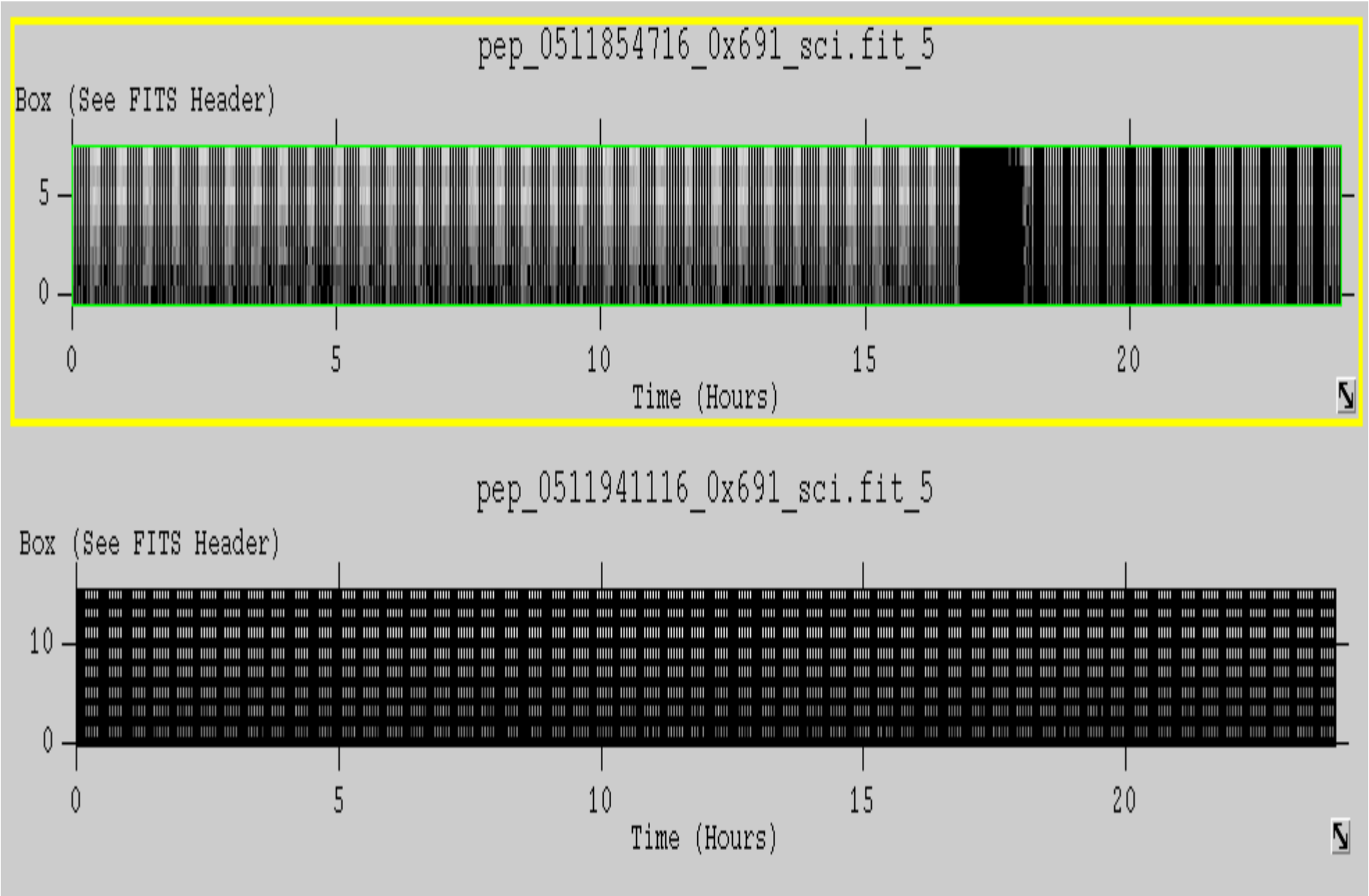
nh-a-pepssi-3-kem2-v1.0/data
Quick Look Spectrograms - A



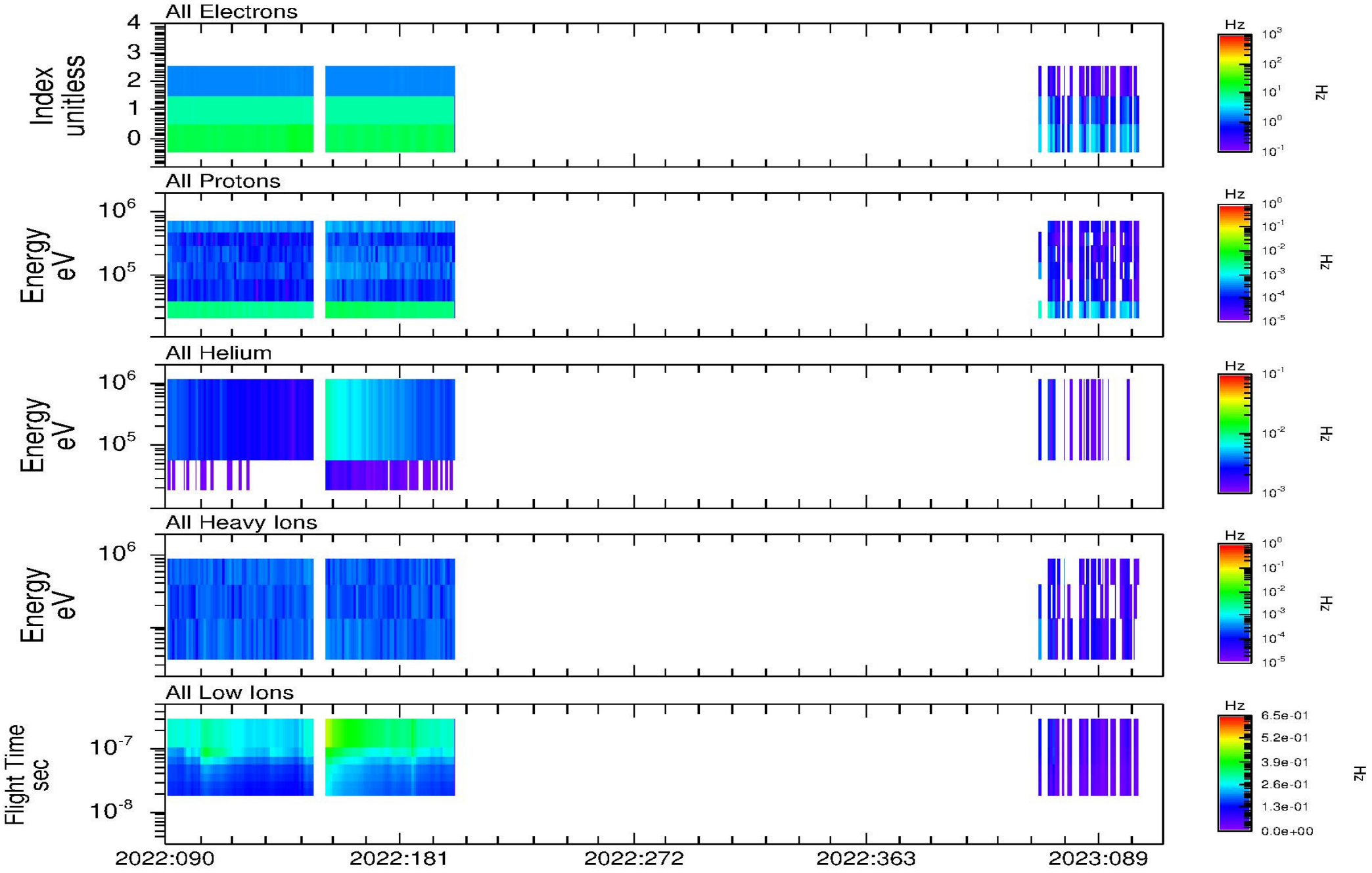
nh-a-pepssi-3-kem2-v1.0/data
Quick Look Spectrograms - B



nh-a-pepssi-3-kem2-v1.0/data
Quick Look Spectrograms - C



nh-a-pepssi-3-kem2-v1.0/data
Quick Look Spectrograms - D



nh-a-pepssi-3-kem2-v1.0/data
Quick Look Spectrograms - E

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BOX1  = 'L01SAll' / Pixel1:  L01SAll Low Ions  (20.559 to  27.045 ns) 1 / sec
BOX3  = 'L03SAll' / Pixel3:  L03SAll Low Ions  (27.370 to  36.126 ns) 1 / sec
BOX5  = 'L05SAll' / Pixel5:  L05SAll Low Ions  (36.450 to  48.773 ns) 1 / sec
BOX7  = 'L07SAll' / Pixel7:  L07SAll Low Ions  (49.098 to  66.286 ns) 1 / sec
BOX9  = 'L09SAll' / Pixel9:  L09SAll Low Ions  (66.610 to  90.284 ns) 1 / sec
BOX11 = 'L11SAll' / Pixel11: L11SAll Low Ions  (90.608 to 123.038 ns) 1 / sec
BOX13 = 'L13SAll' / Pixel13: L13SAll Low Ions (123.362 to 168.440 ns) 1 / sec
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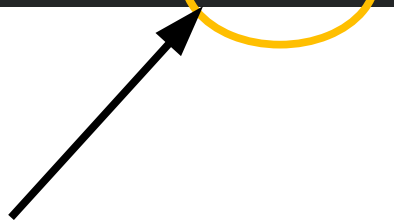
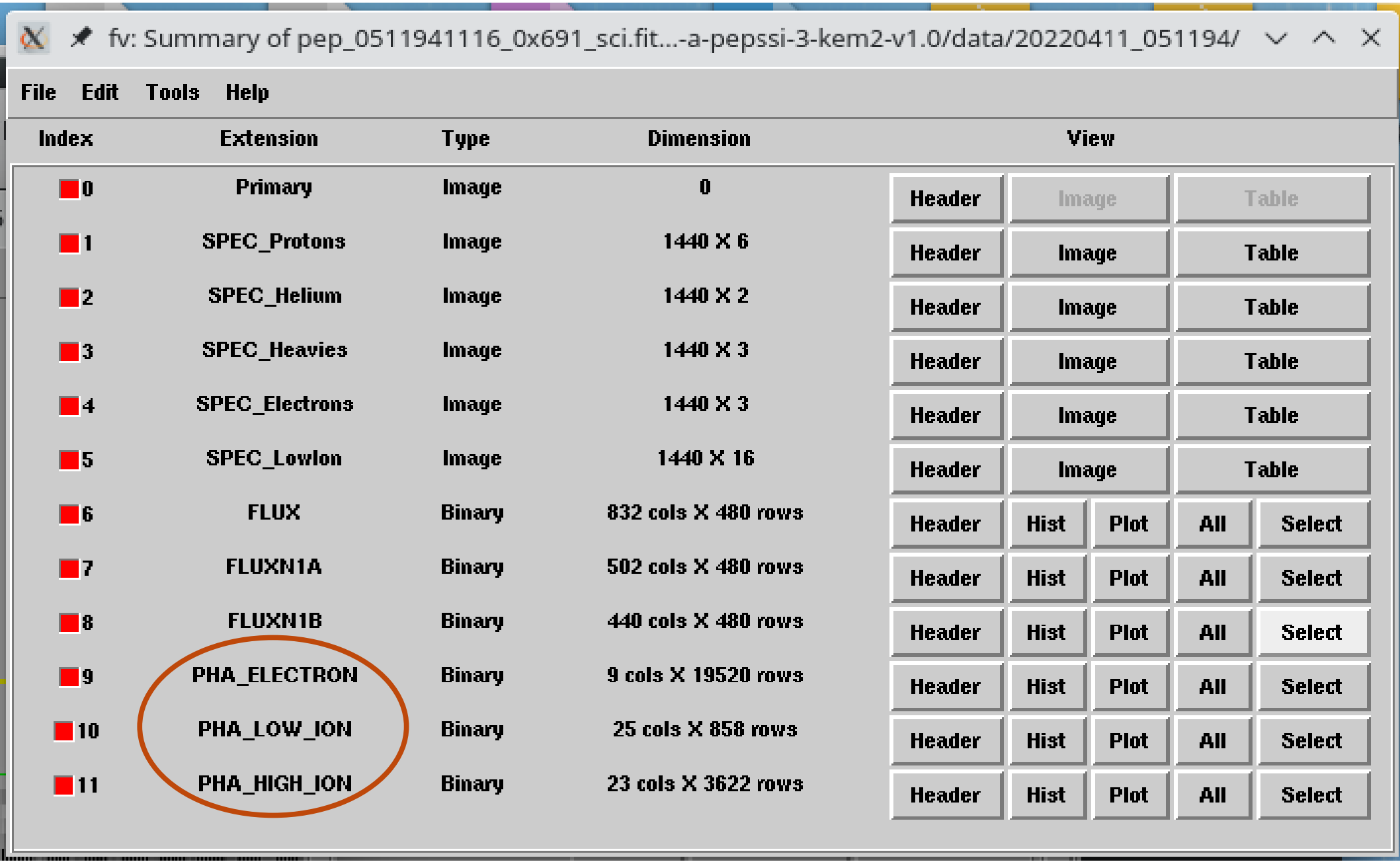
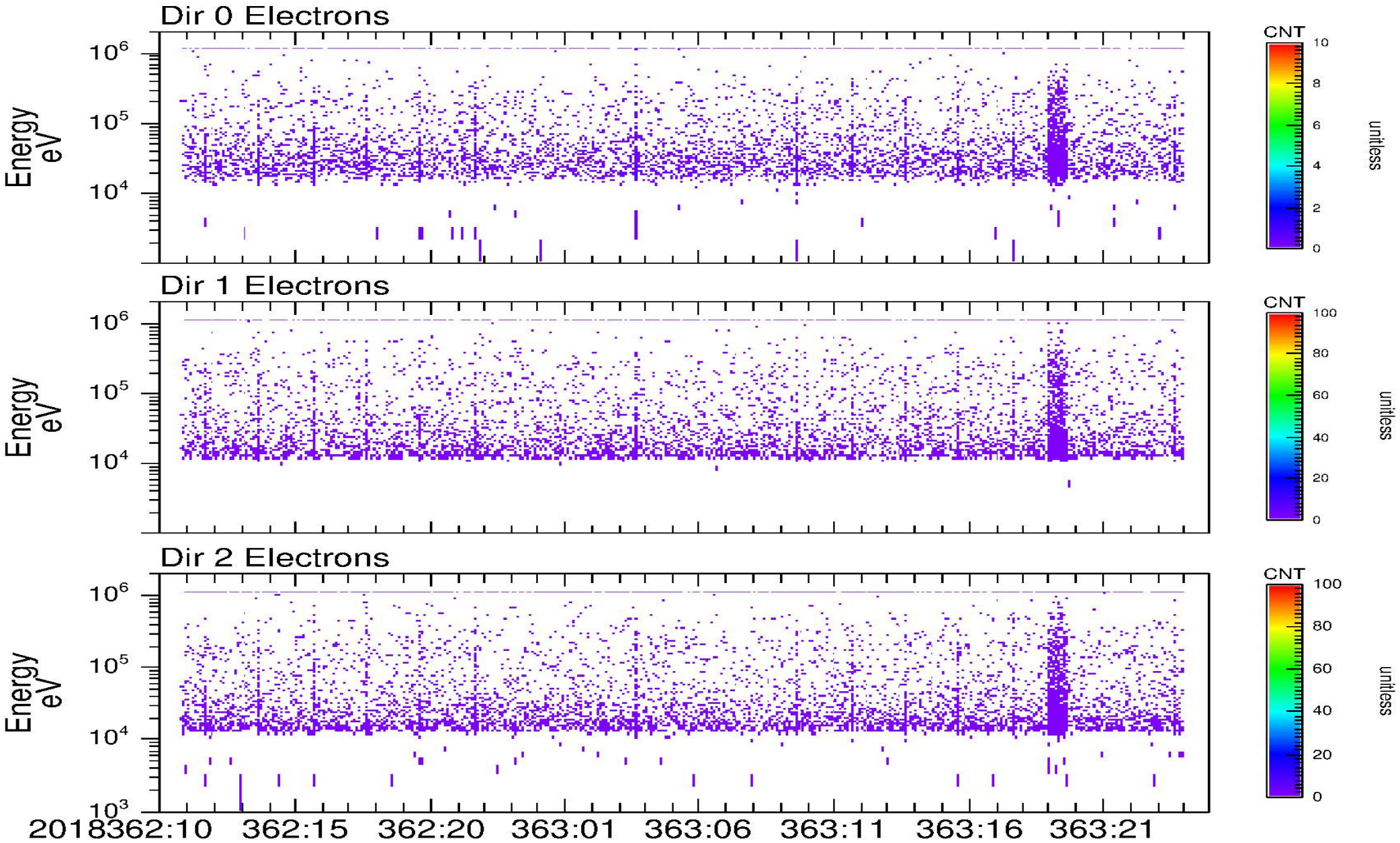


Is this number correct?

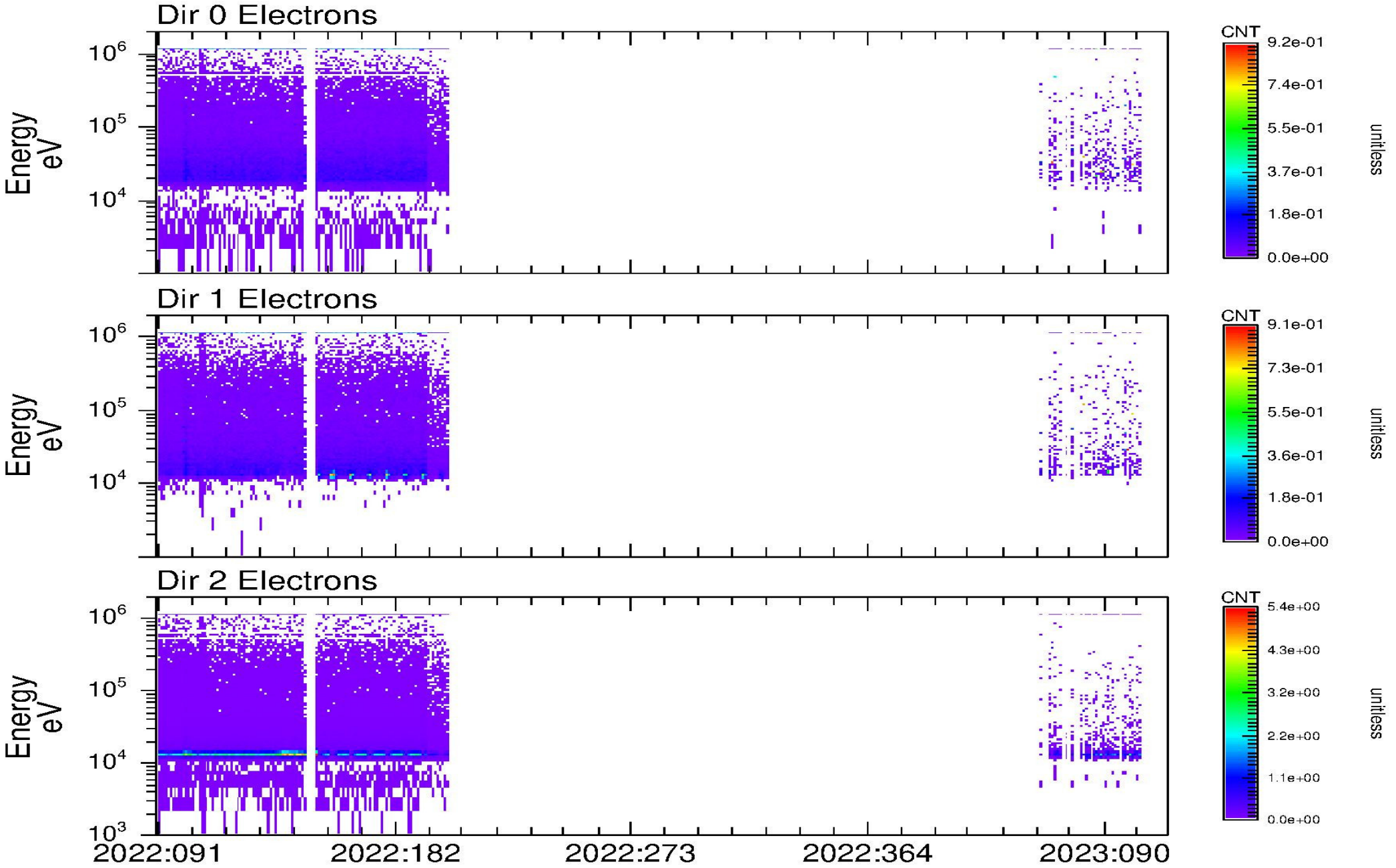
nh-a-pepssi-3-kem2-v1.0/data
PEPSSI FIT File Structure



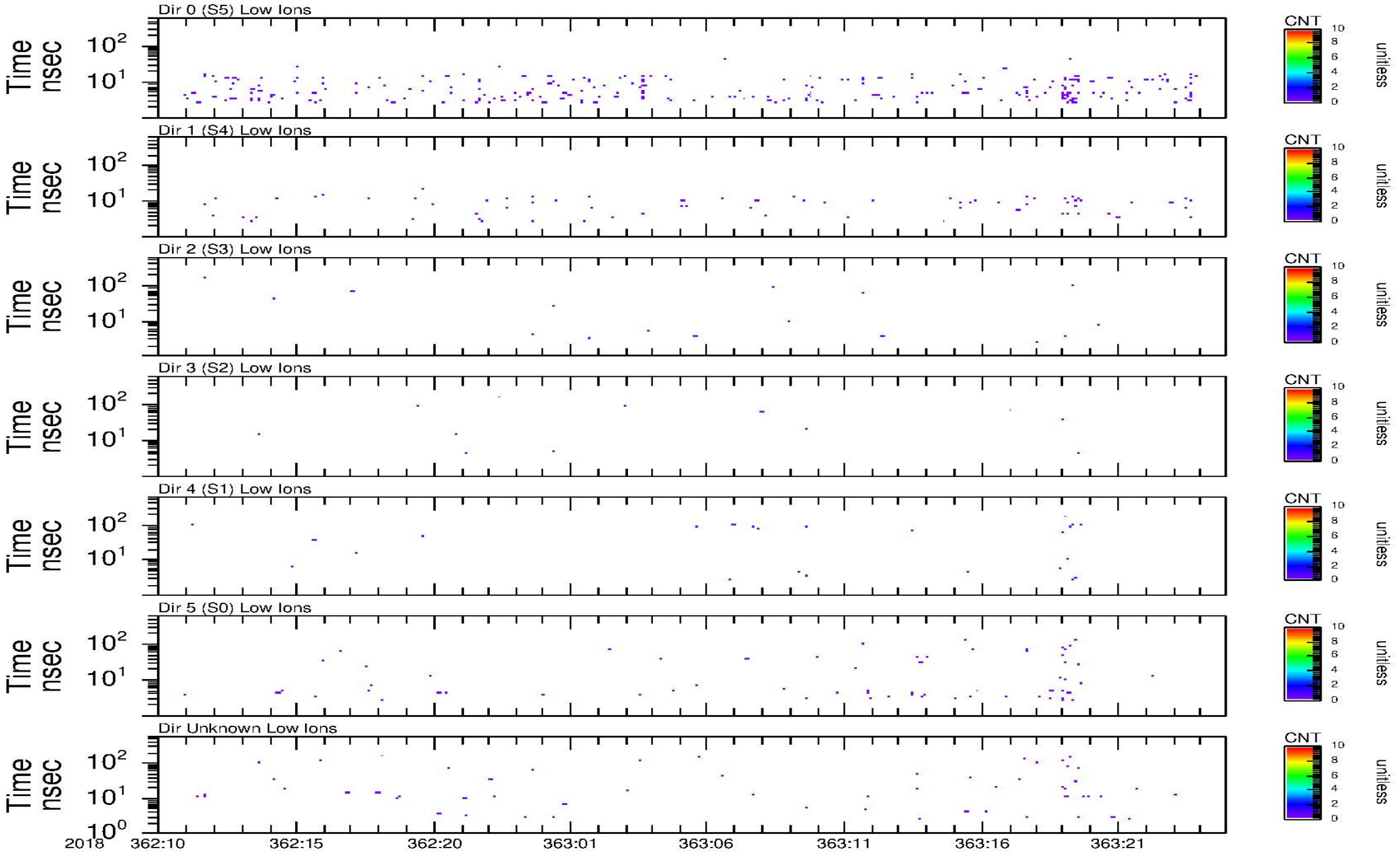
nh-a-pepssi-3-kem2-v1.0/data
Electron PHA - A



nh-a-pepssi-3-kem2-v1.0/data
Electron PHA - B



nh-a-pepssi-3-kem2-v1.0/data
Low Ion PHA - A



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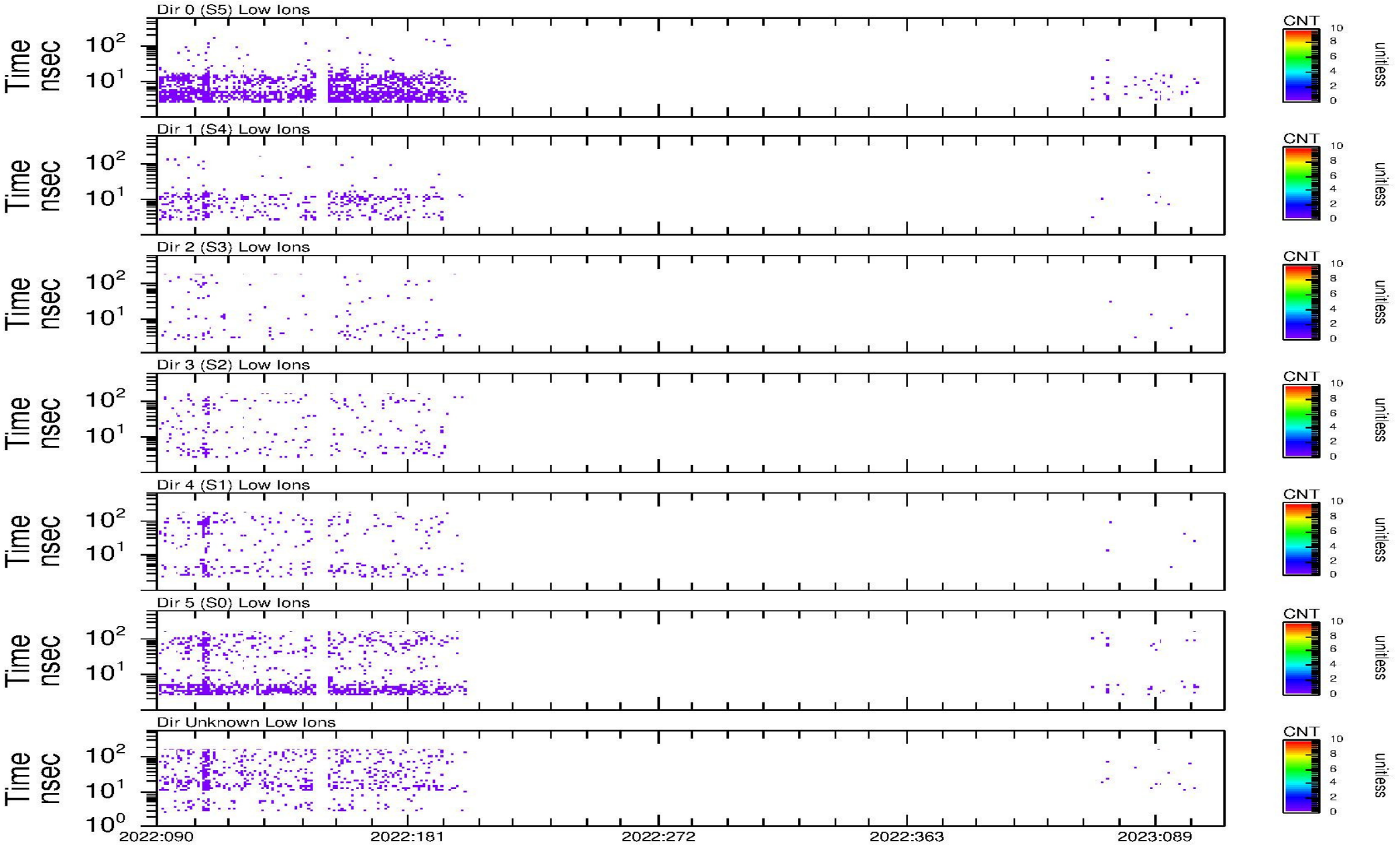
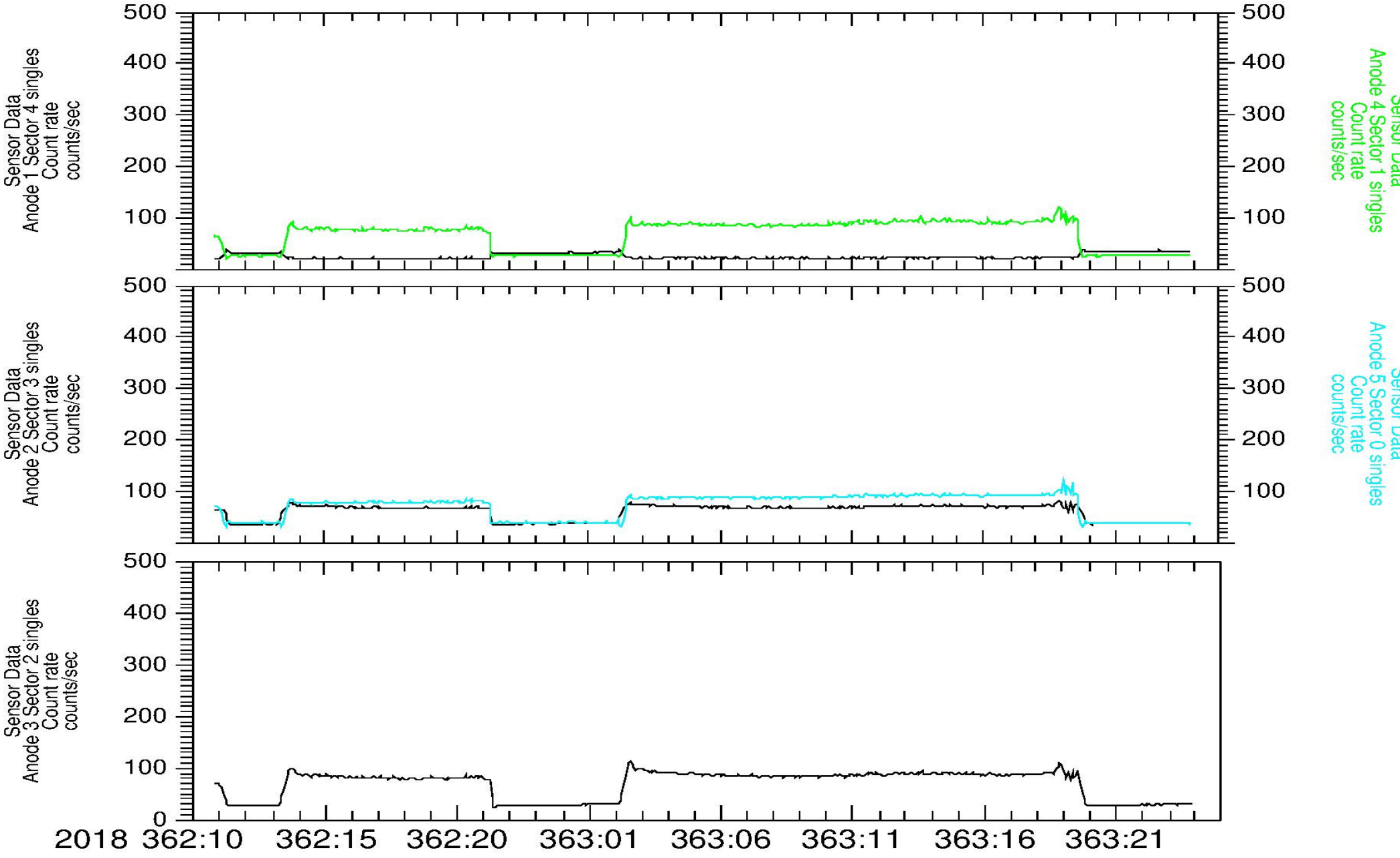
Low Ion PHA - B



nh-a-pepssi-3-kem2-v1.0/data
PEPSSI FIT File Structure

nh-a-pepssi-3-kem2-v1.0/data
FLUX Anode Singles - A



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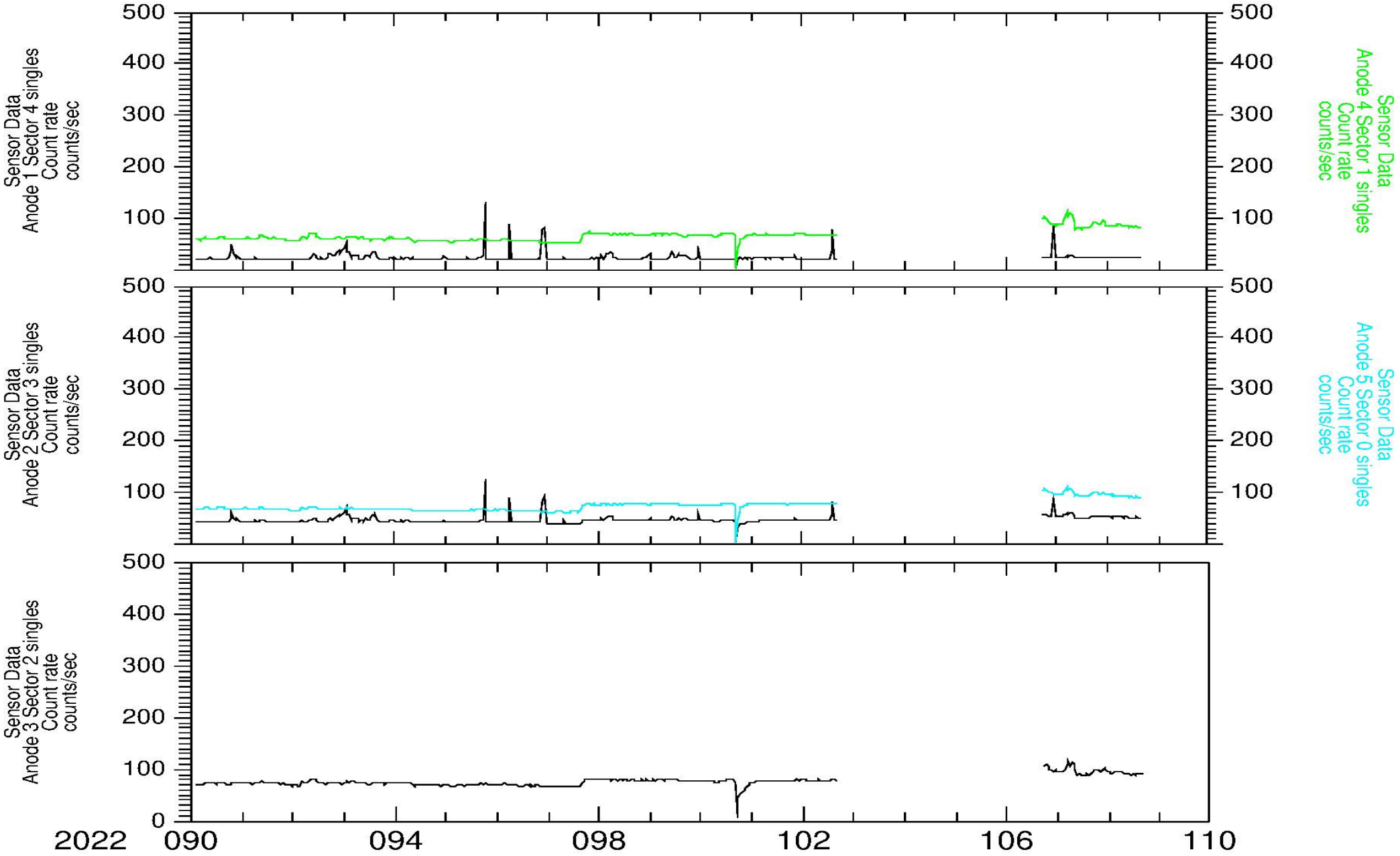
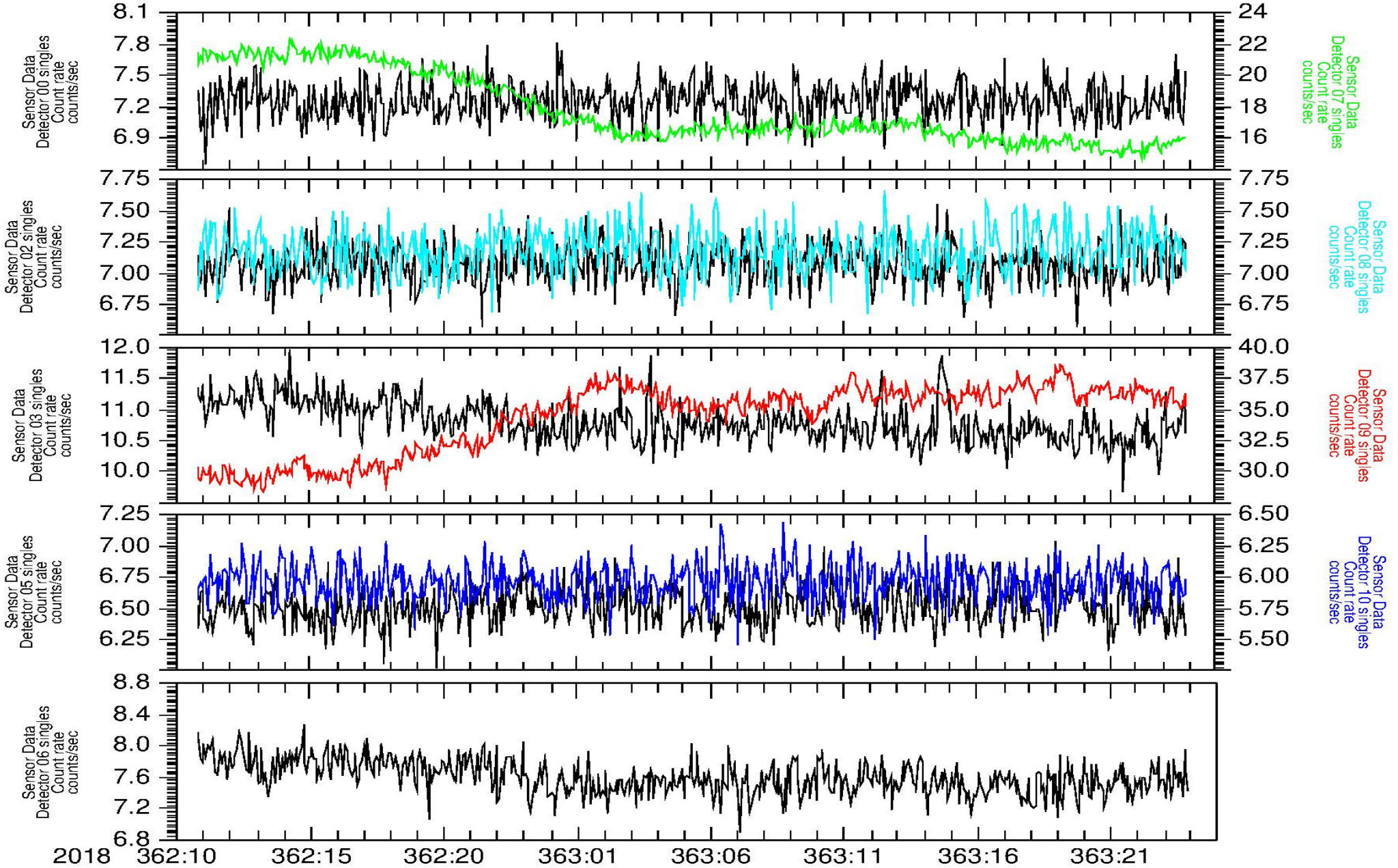
FLUX Anode Singles - B



nh-a-pepssi-3-kem2-v1.0/data
FLUX Detector Singles - A



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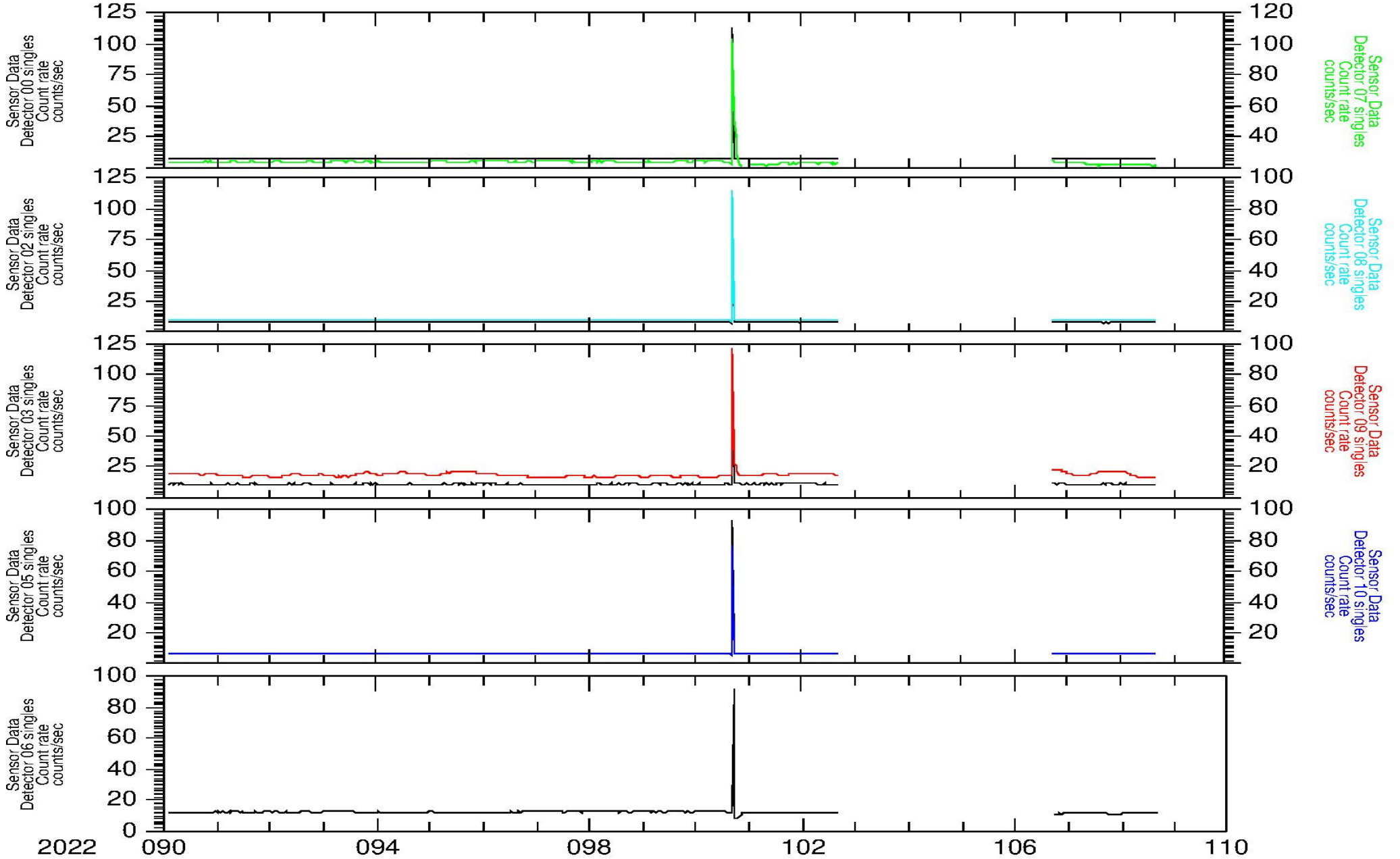
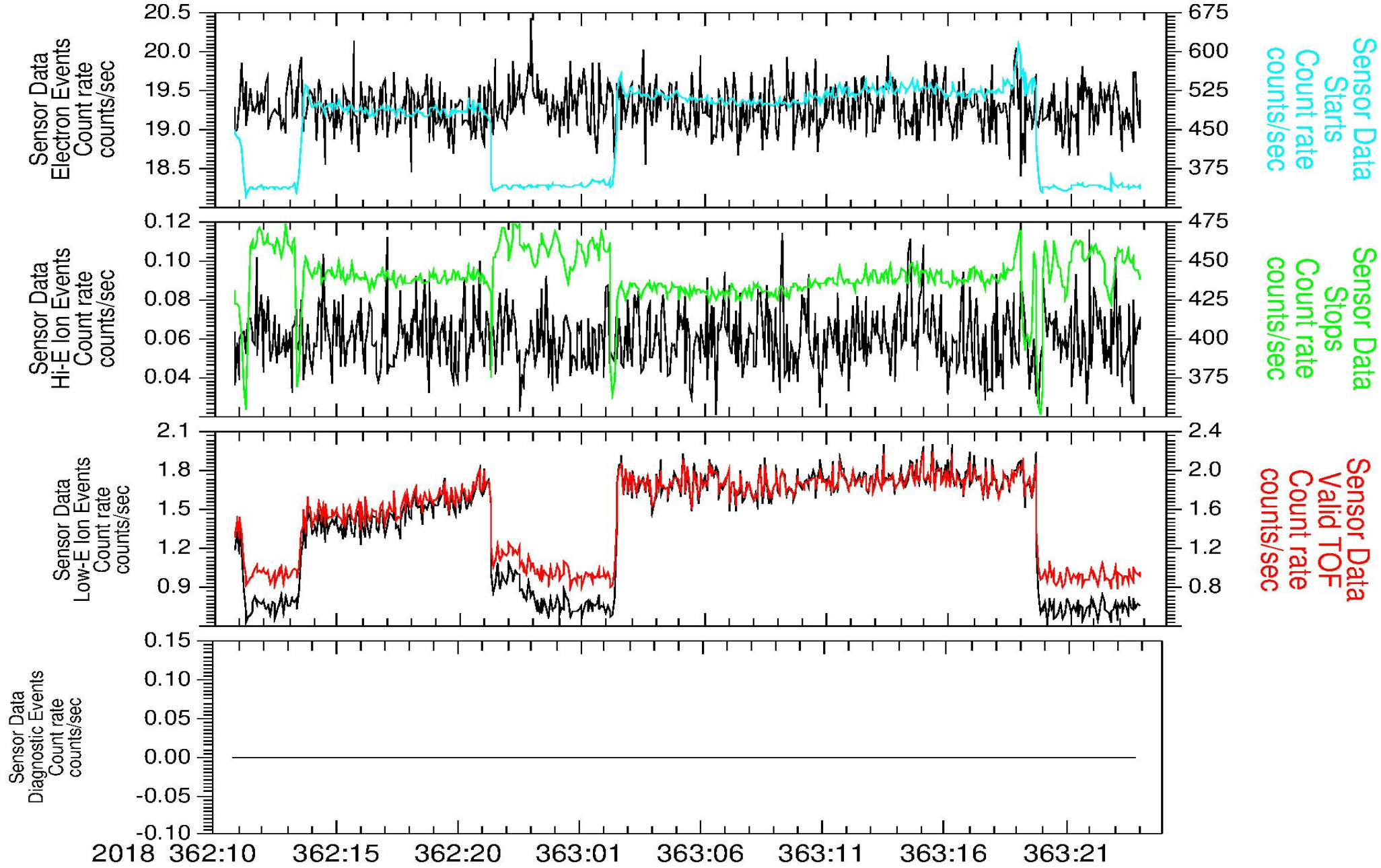
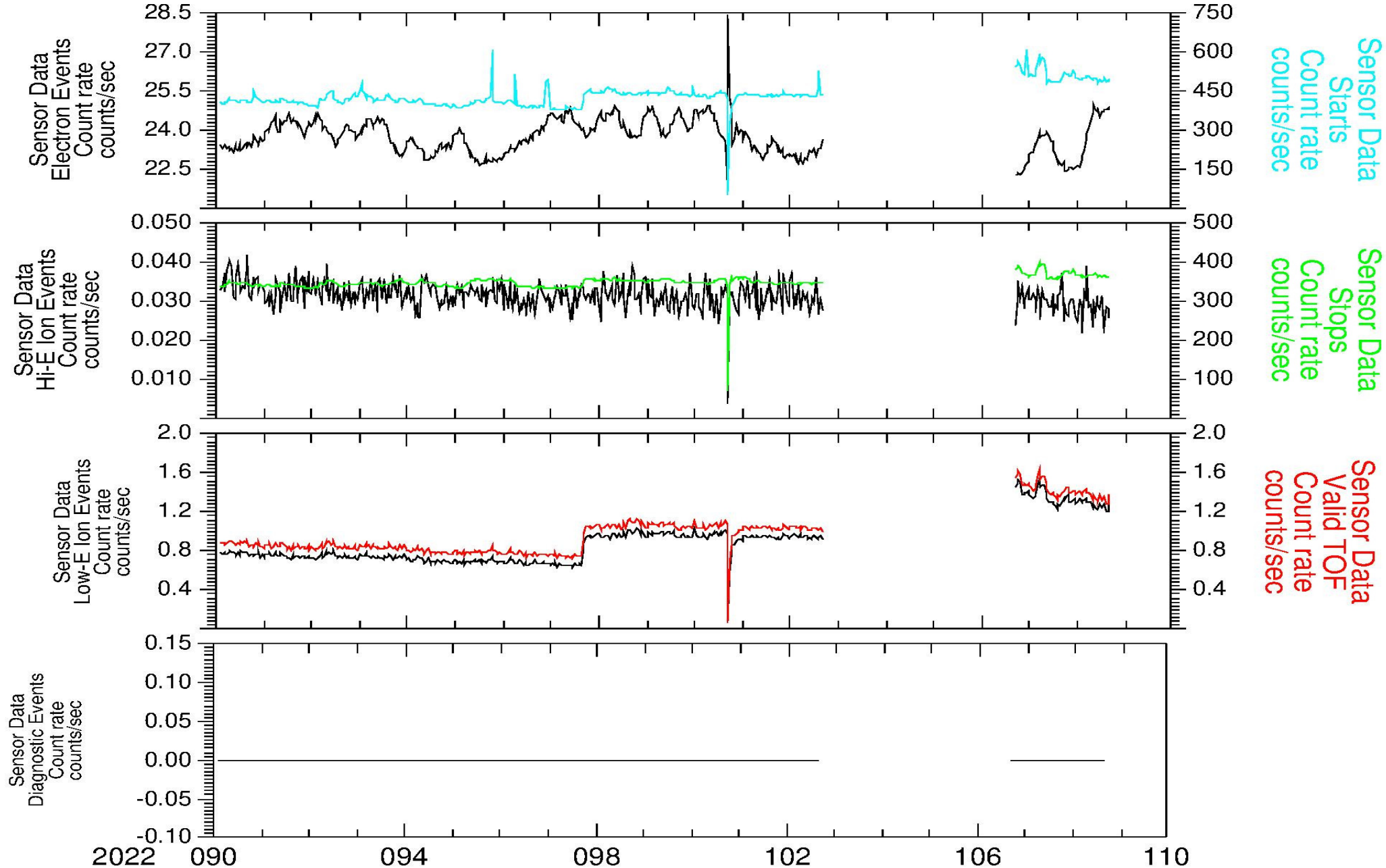
FLUX Detector Singles - B



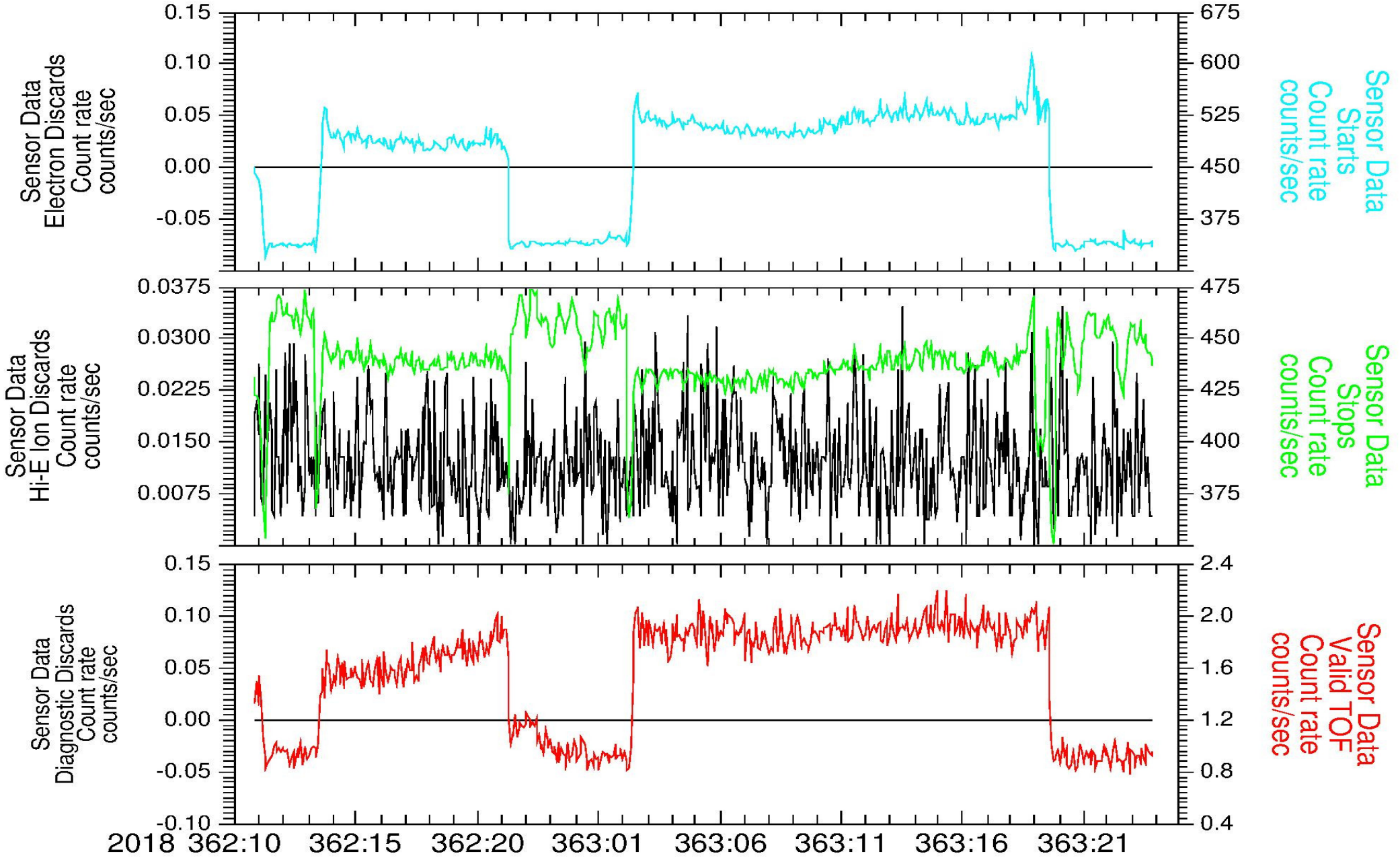
nh-a-pepssi-3-kem2-v1.0/data
FLUX Events “C” Rates - A



nh-a-pepssi-3-kem2-v1.0/data
FLUX Events “C” Rates - B



nh-a-pepssi-3-kem2-v1.0/data
FLUX Discards “J” Rates - A



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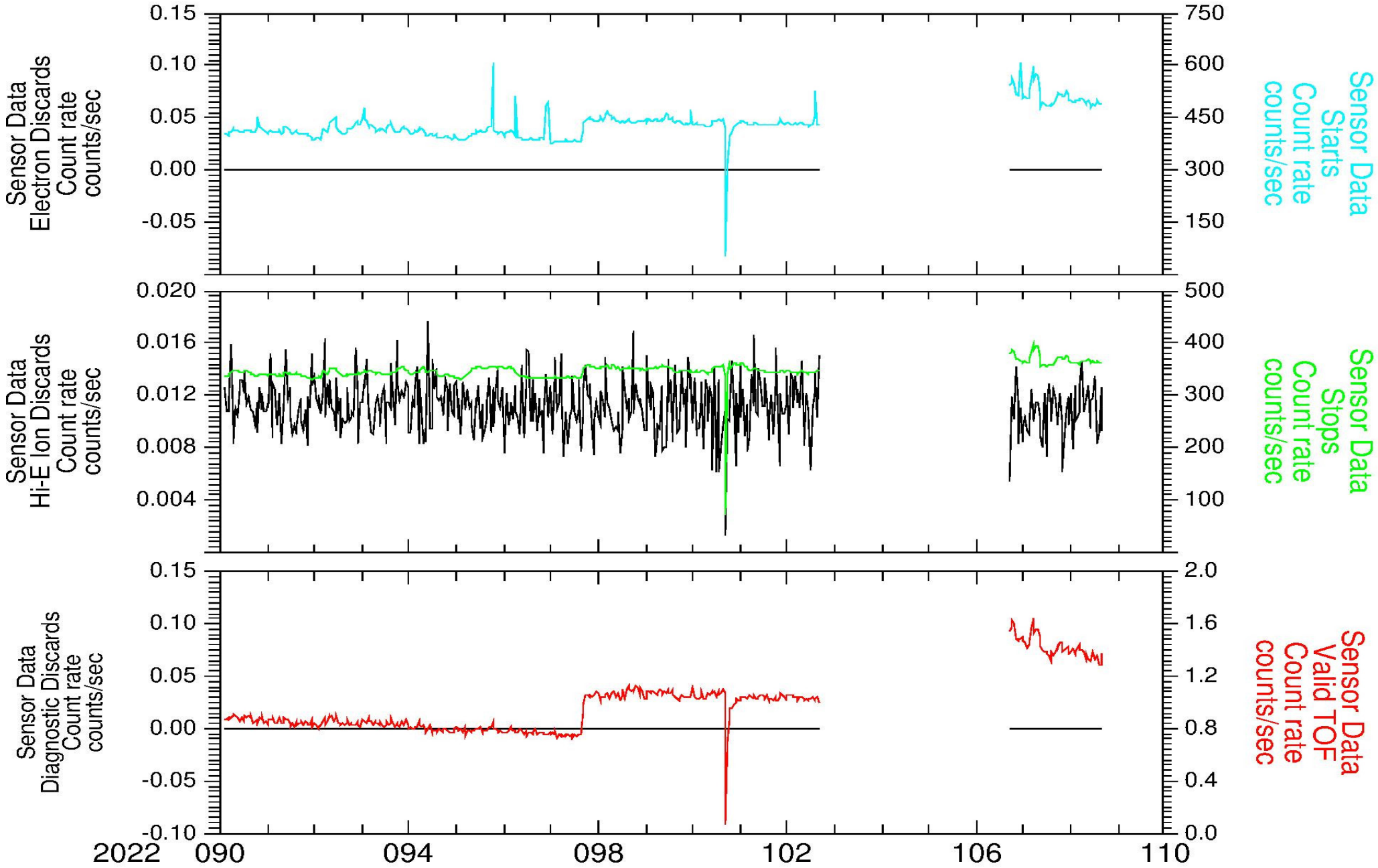
FLUX Discards “J” Rates - B



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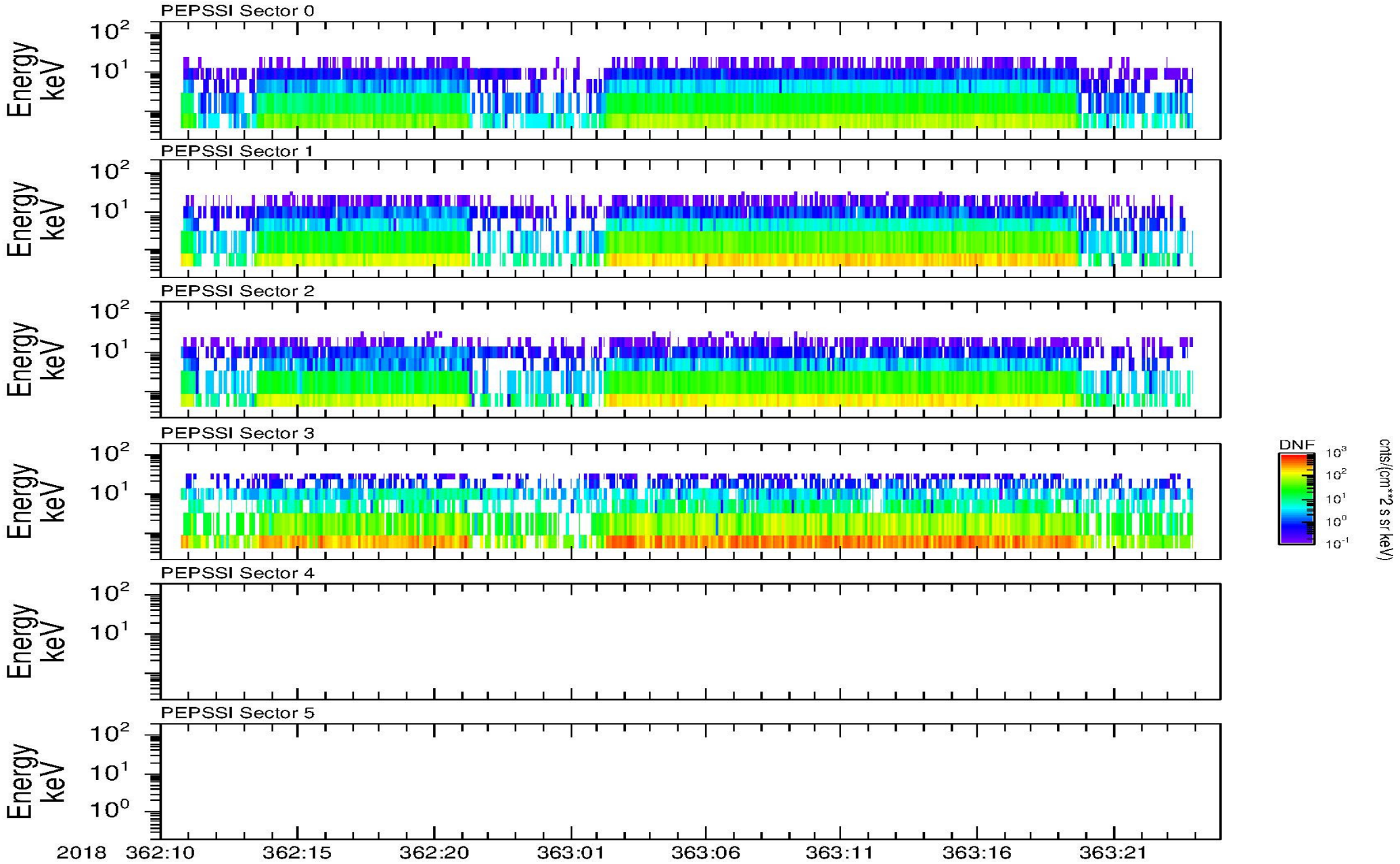
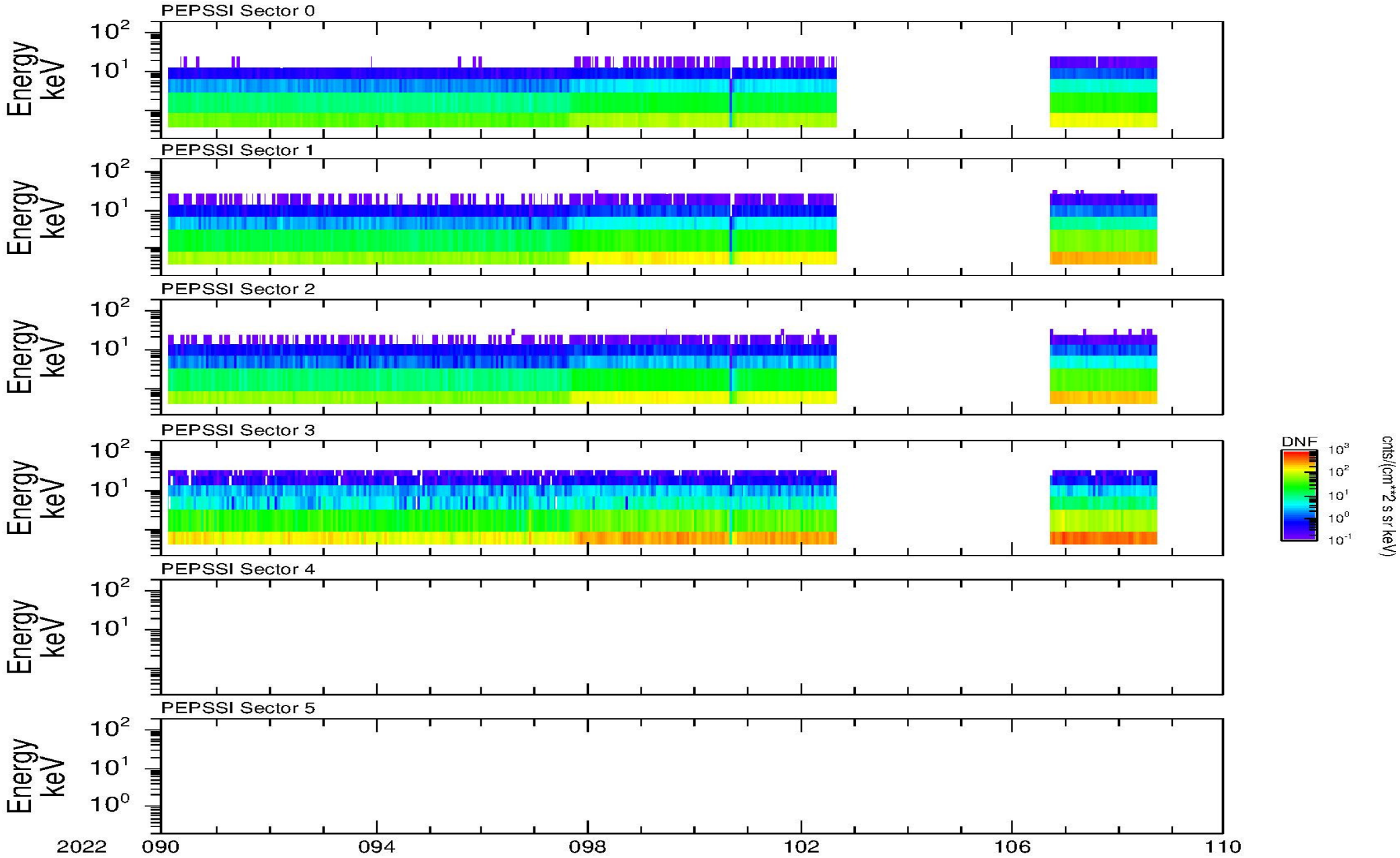
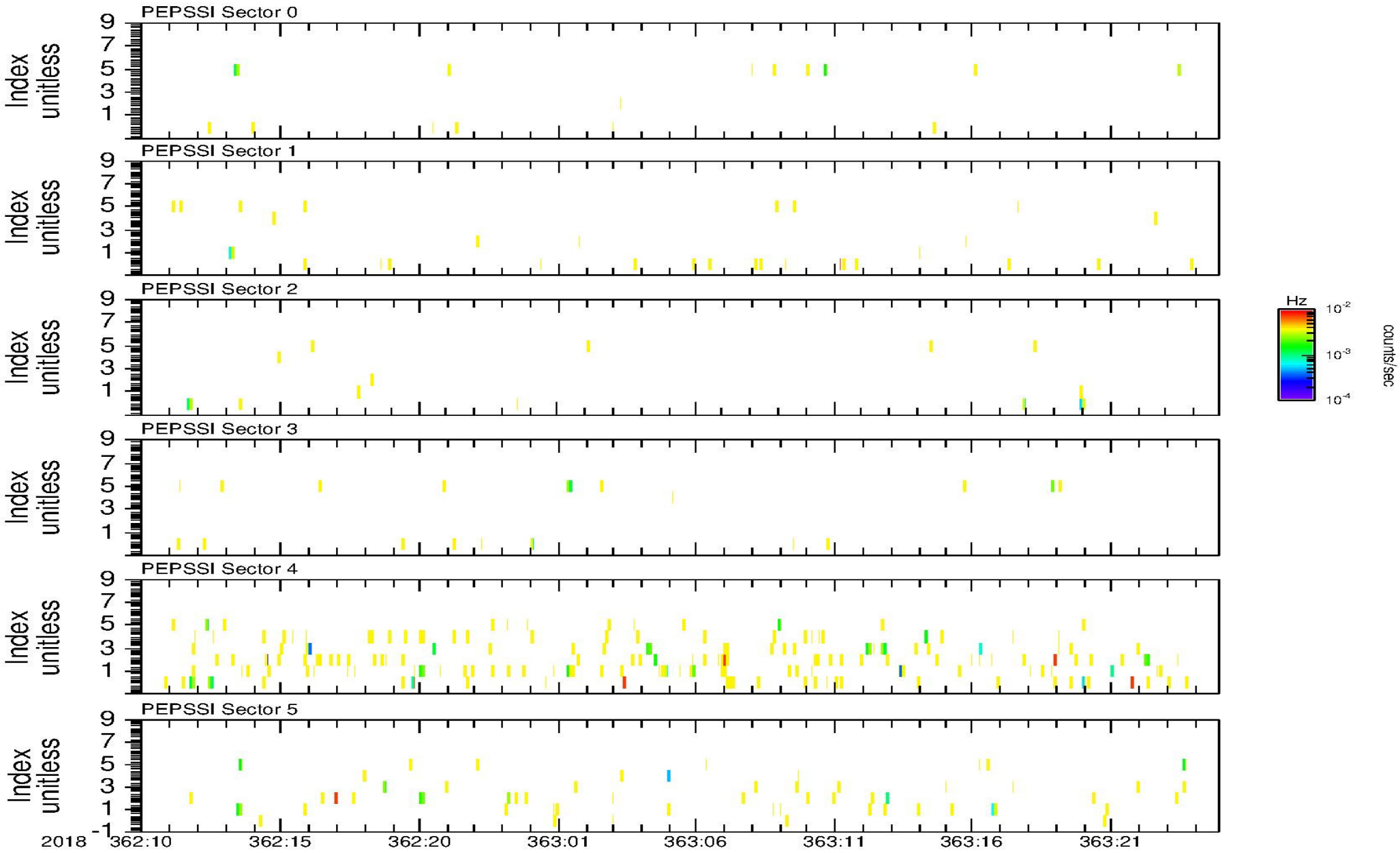
FLUX Doubles (“L”) DNF - A



nh-a-pepssi-3-kem2-v1.0/data
FLUX Doubles (“L”) DNF - B



nh-a-pepssi-3-kem2-v1.0/data
FLUX Triples (“D”) CPS Protons - A



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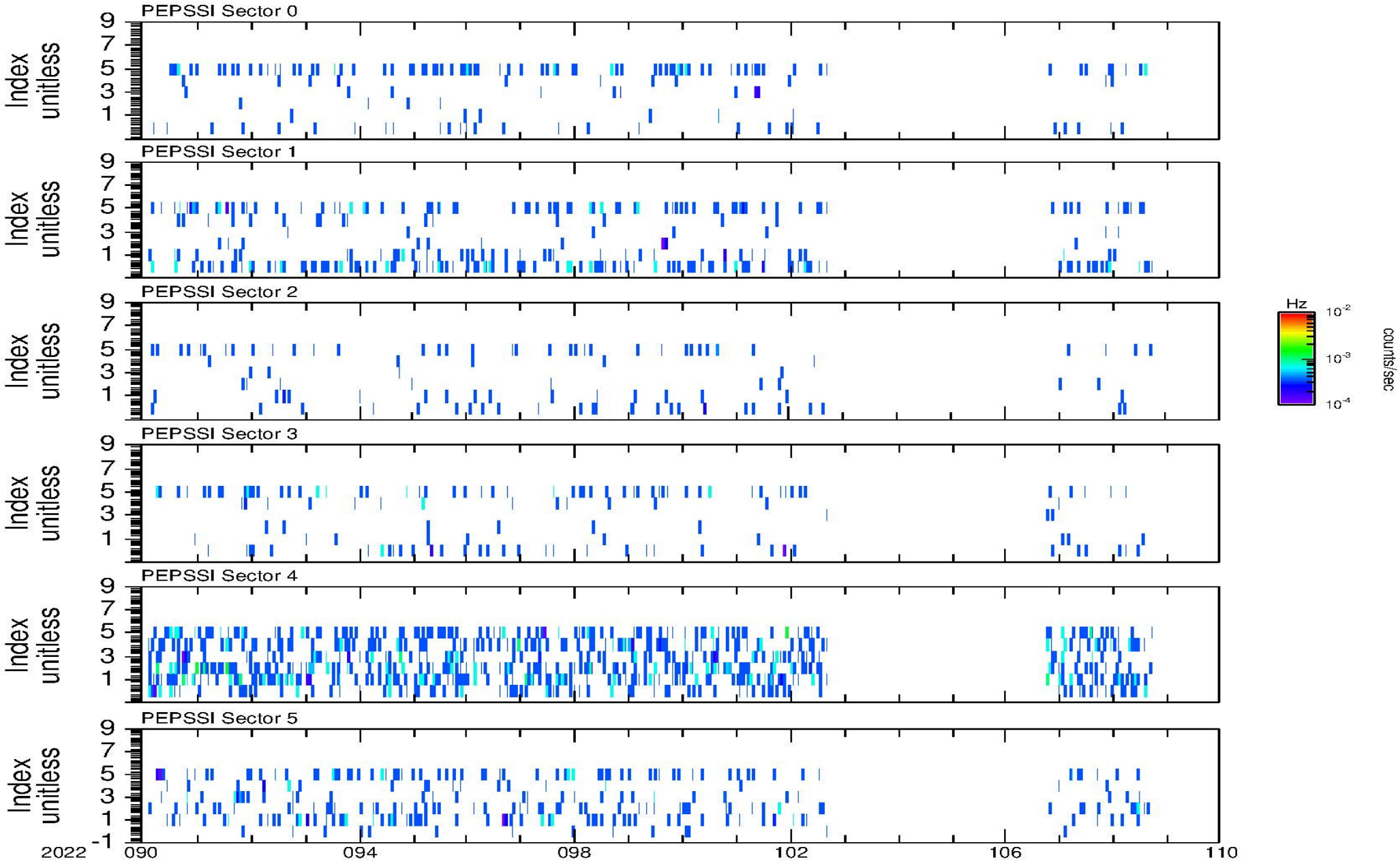
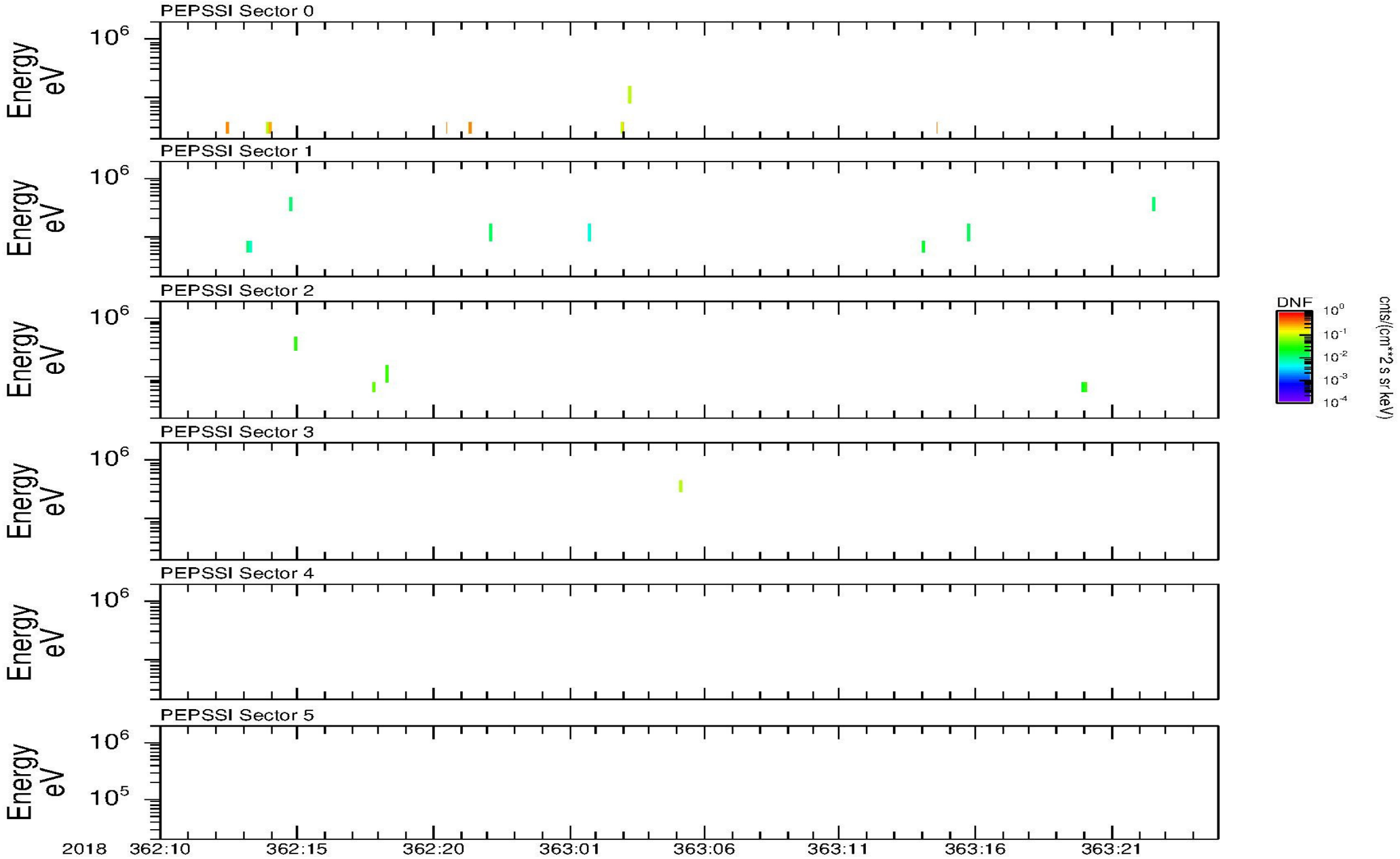
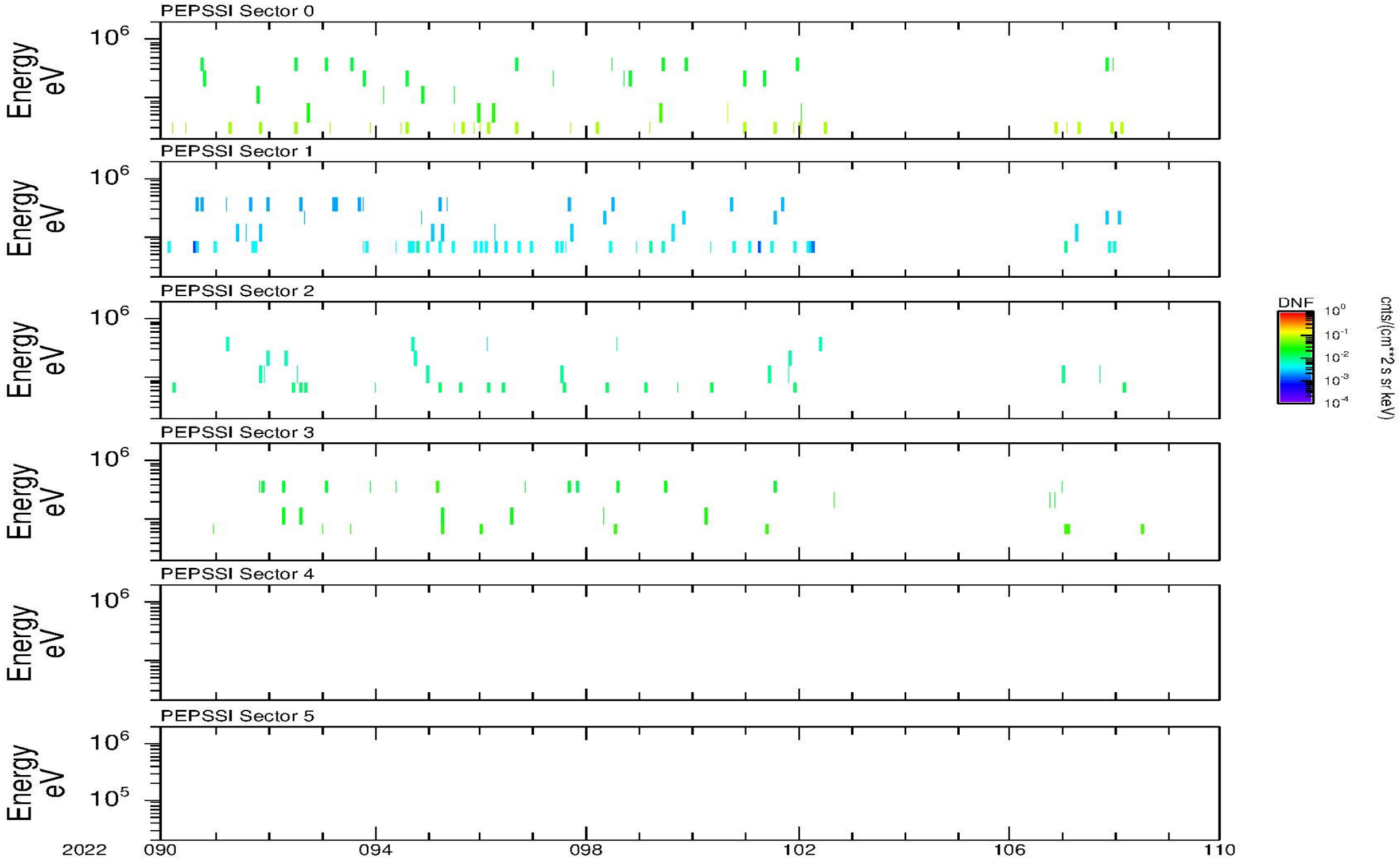
FLUX Triples (“D”) CPS Protons - B



nh-a-pepssi-3-kem2-v1.0/data
FLUX Triples (“D”) DNF Protons - A



nh-a-pepssi-3-kem2-v1.0/data
FLUX Triples (“D”) DNF Protons - B



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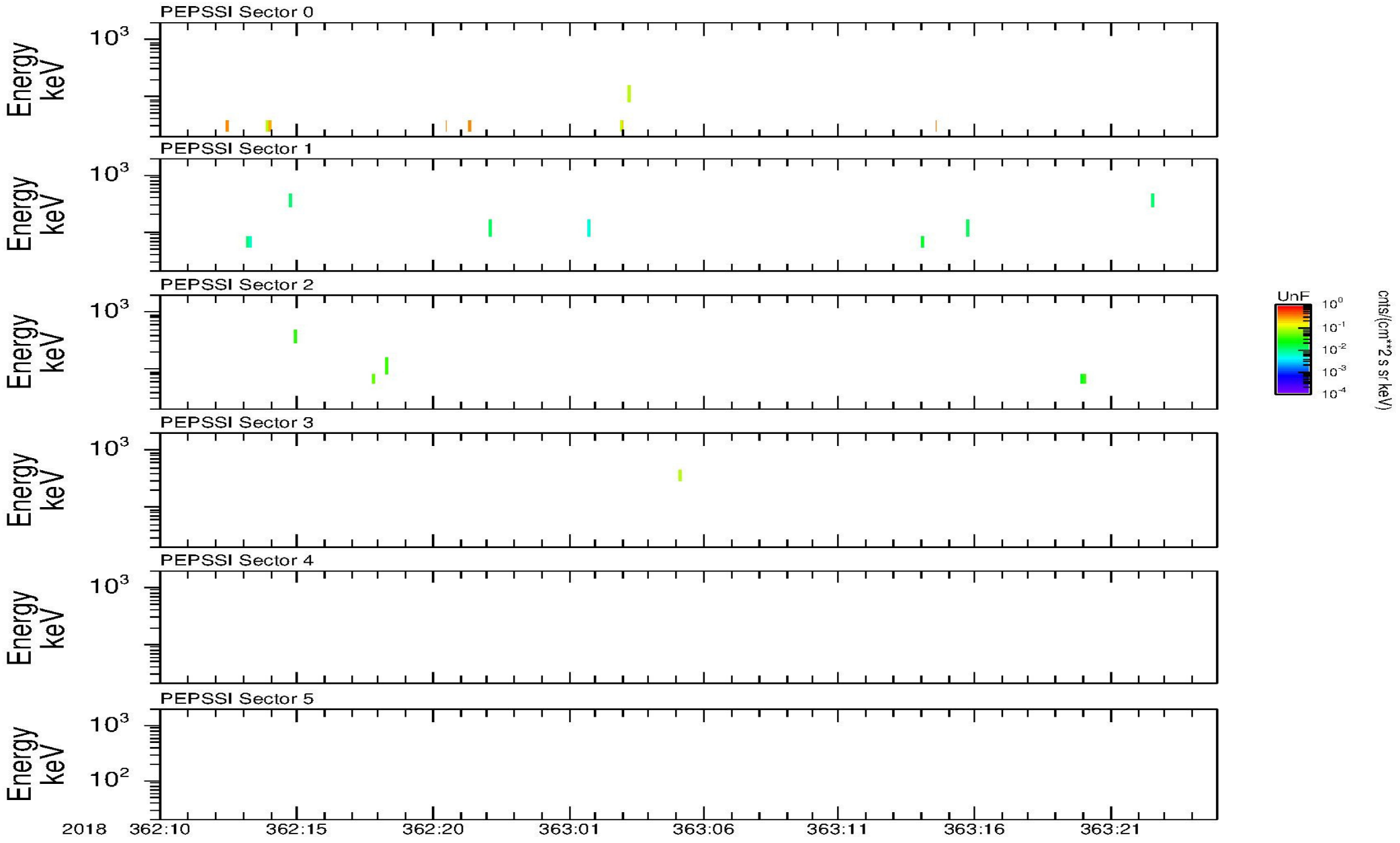
FLUX Triples (“D”) UNC Protons - A



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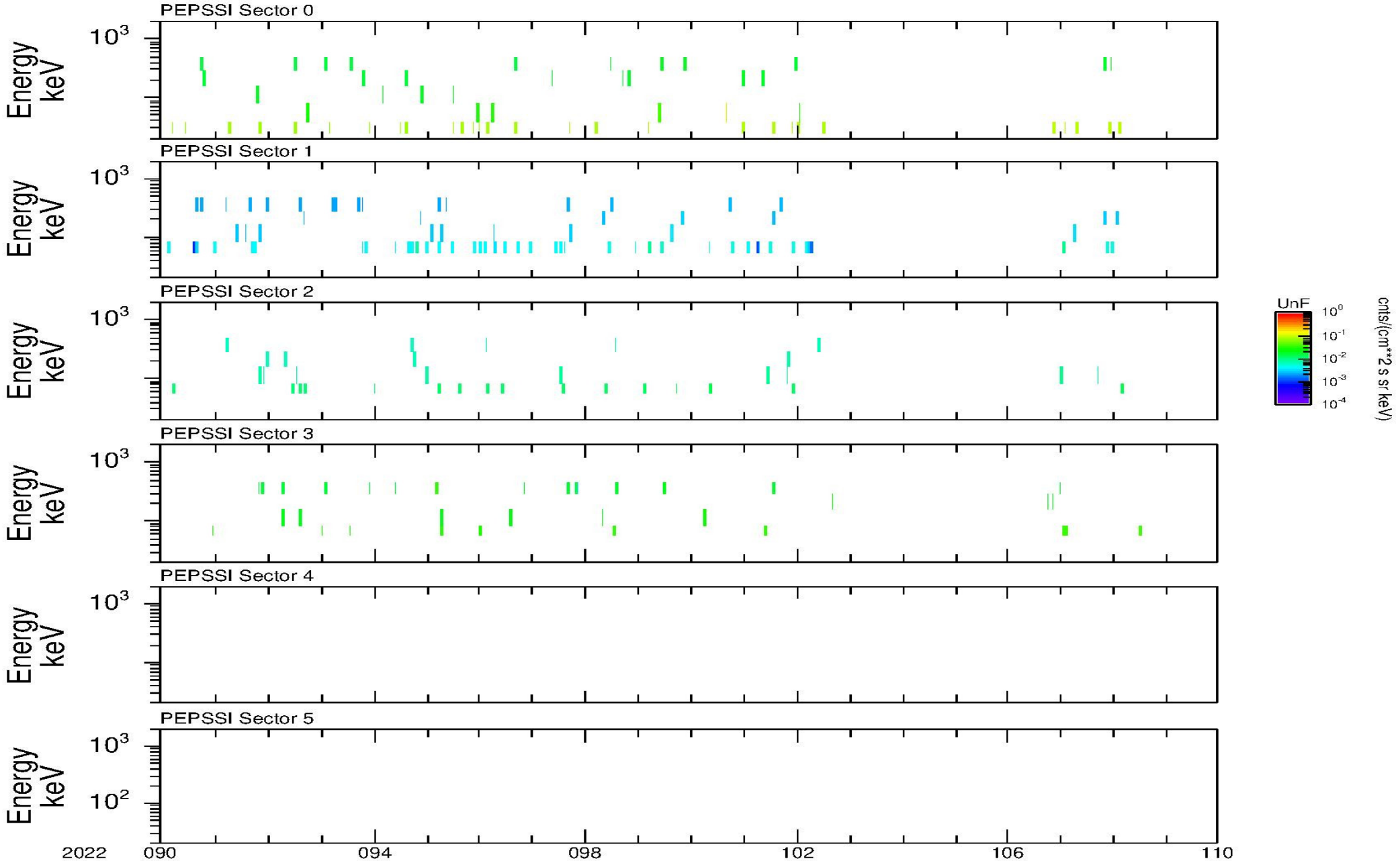
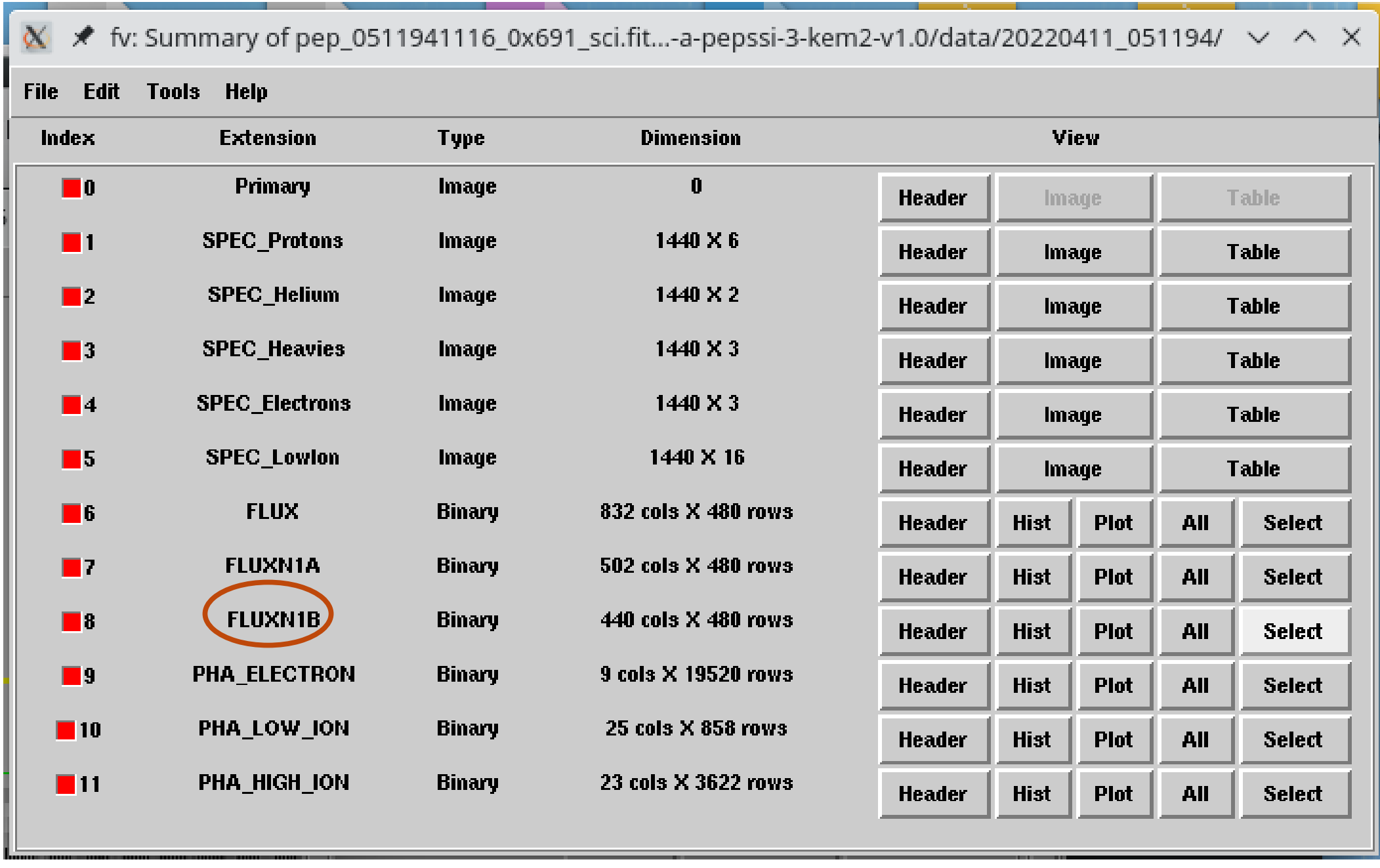
FLUX Triples (“D”) UNC Protons - B



nh-a-pepssi-3-kem2-v1.0/data
PEPSSI FIT File Structure



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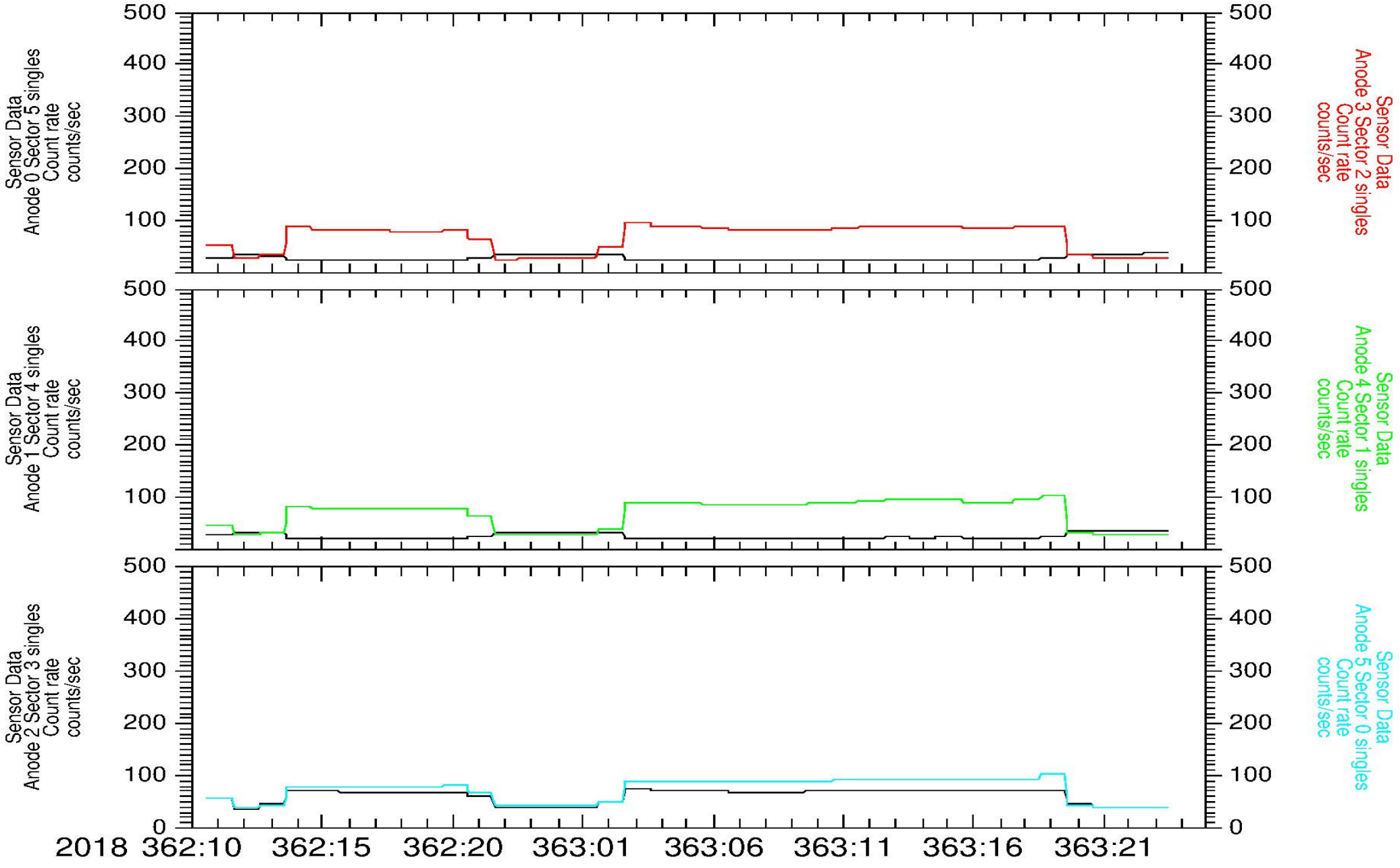
FLUXN1B Anode Singles - A



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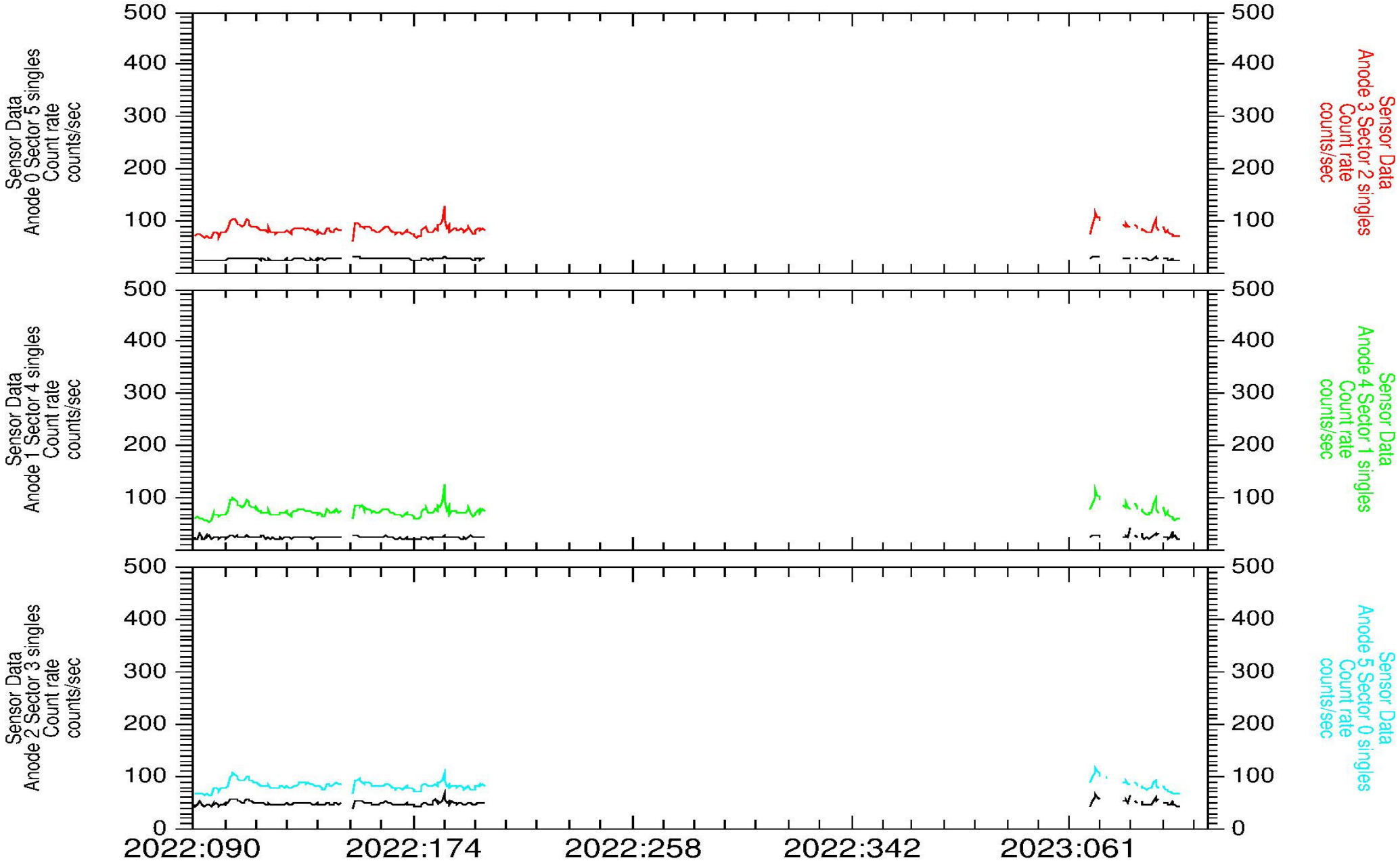

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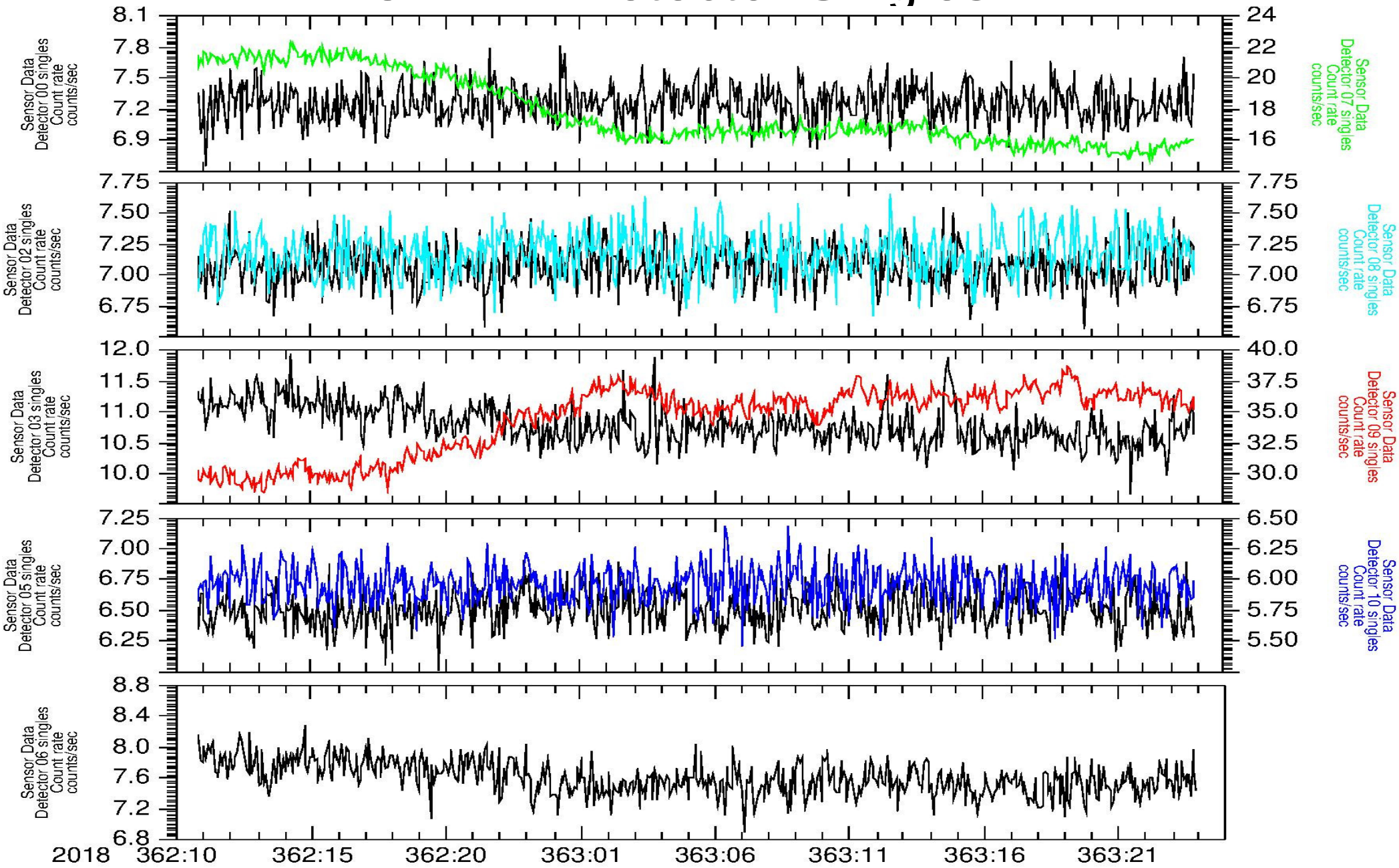
FLUXN1B Detector Singles - A



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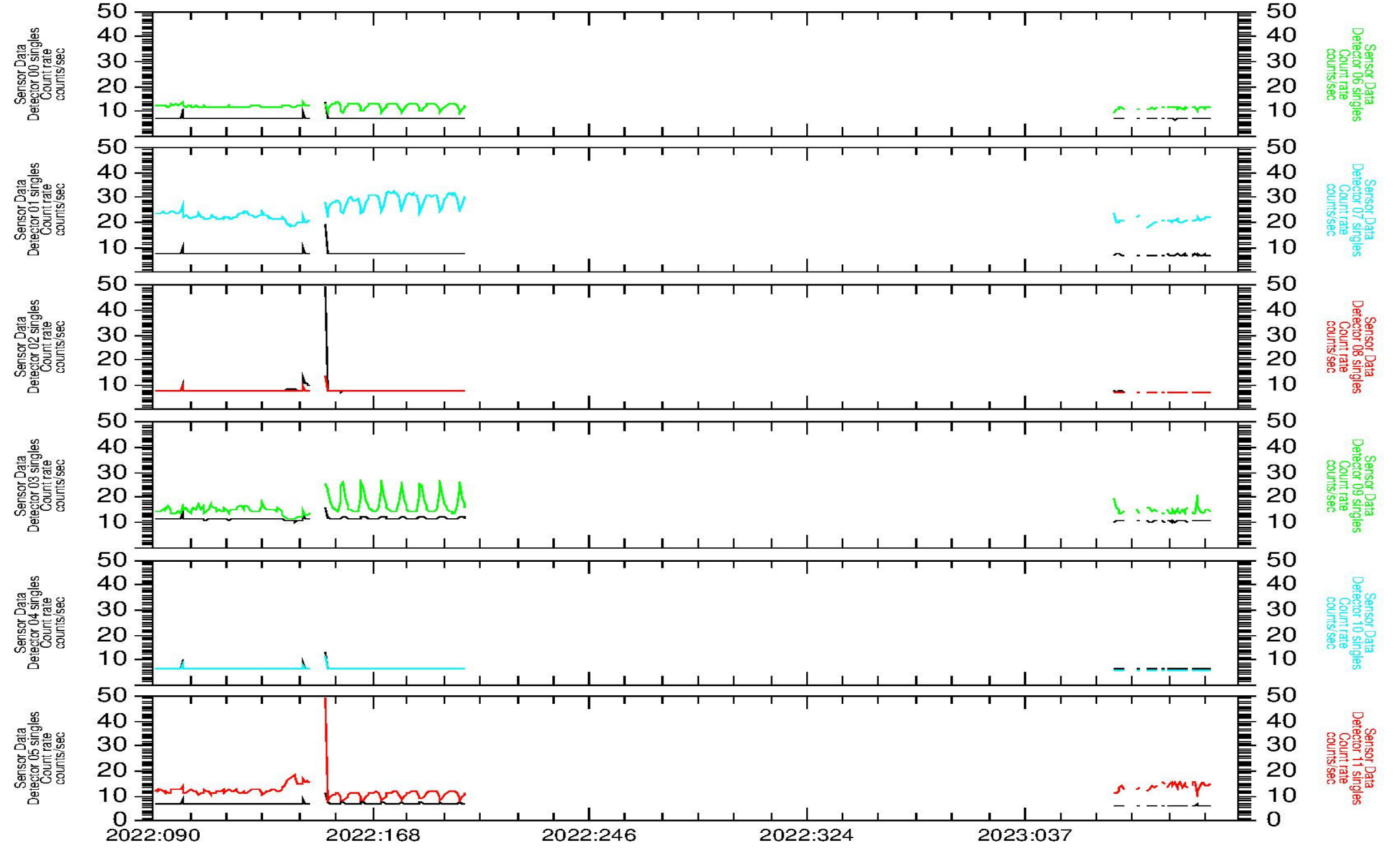

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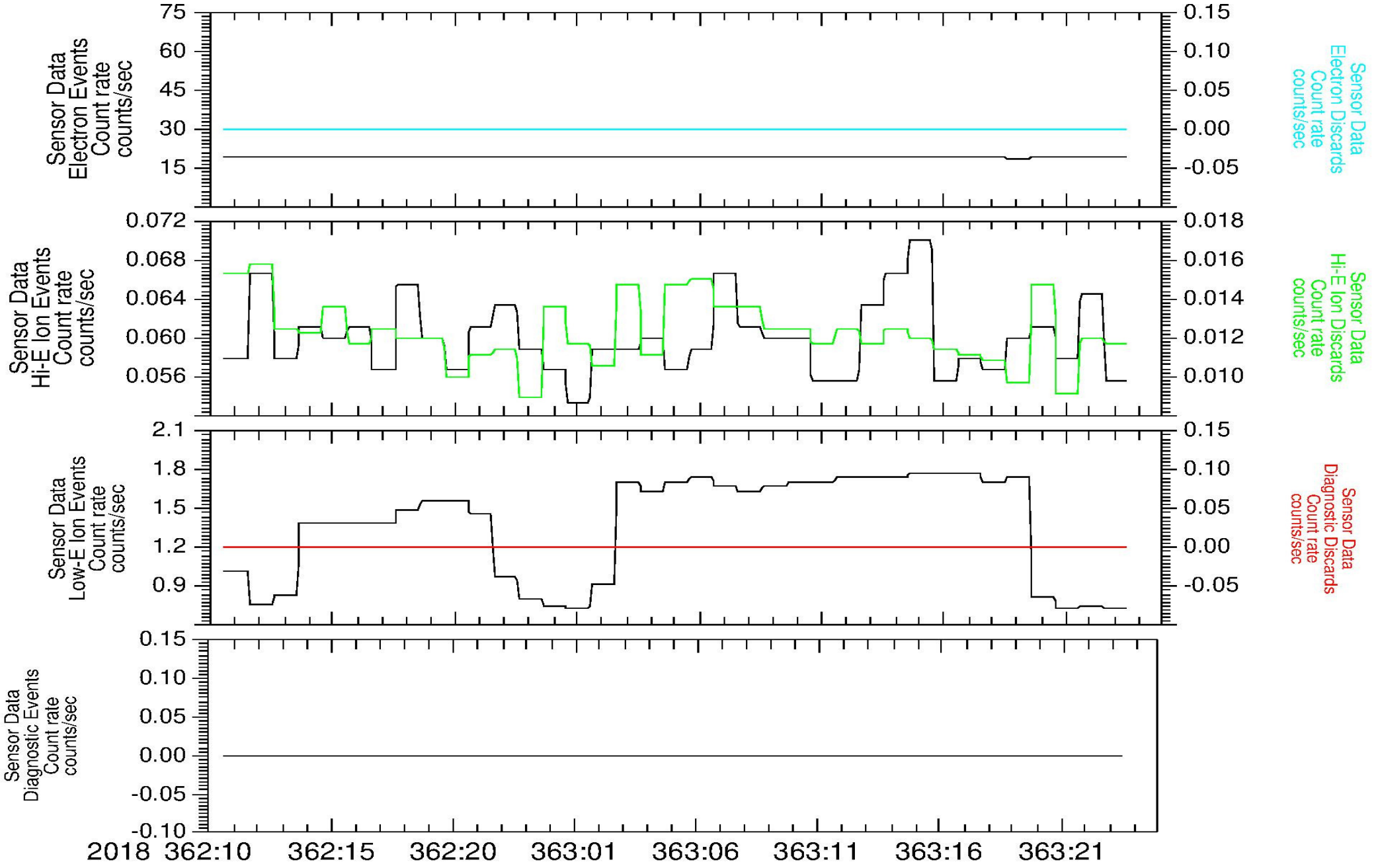
FLUXN1B Events & Discards - “J” Rates - A



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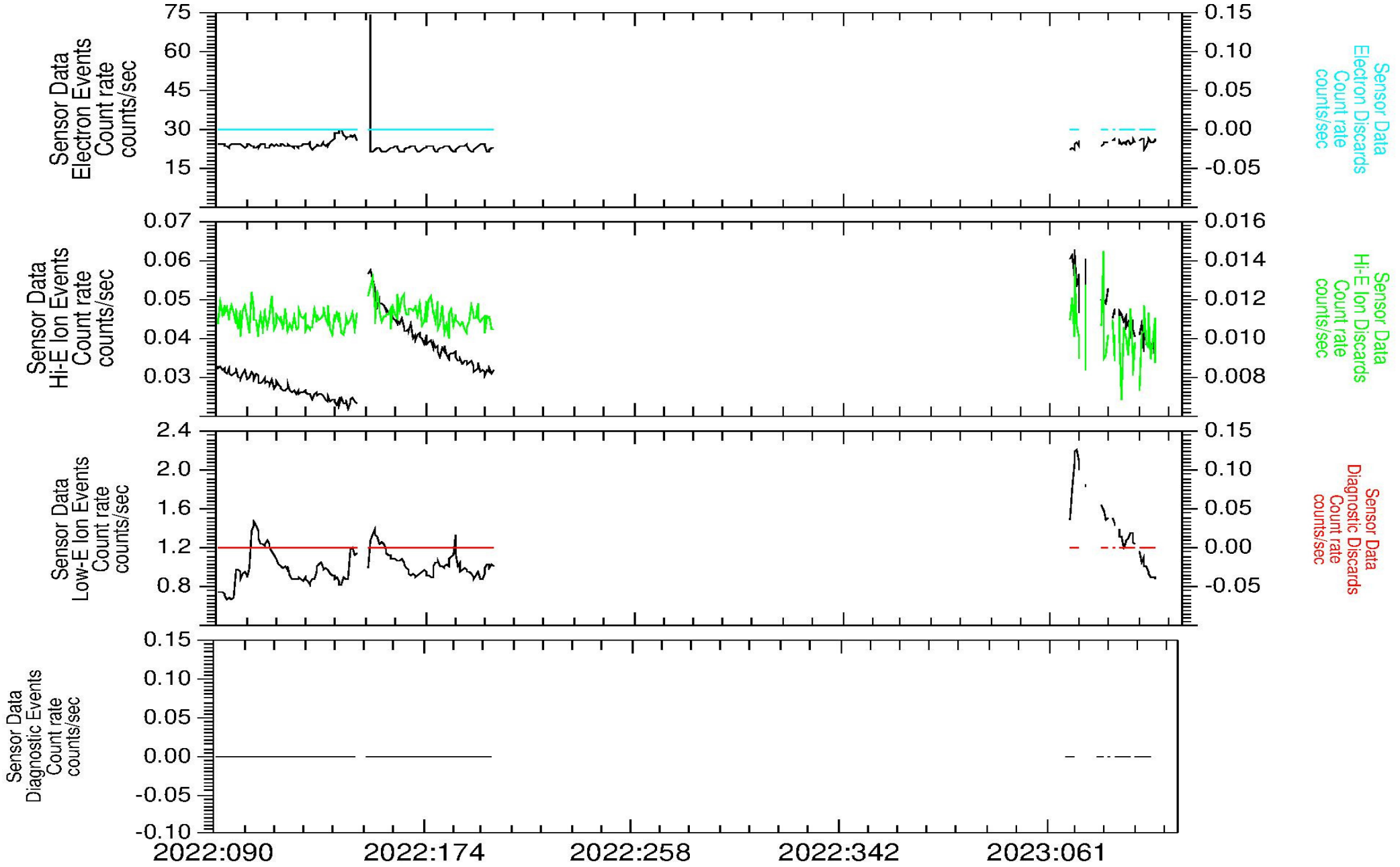
FLUXN1B Events & Discards - “J” Rates - B



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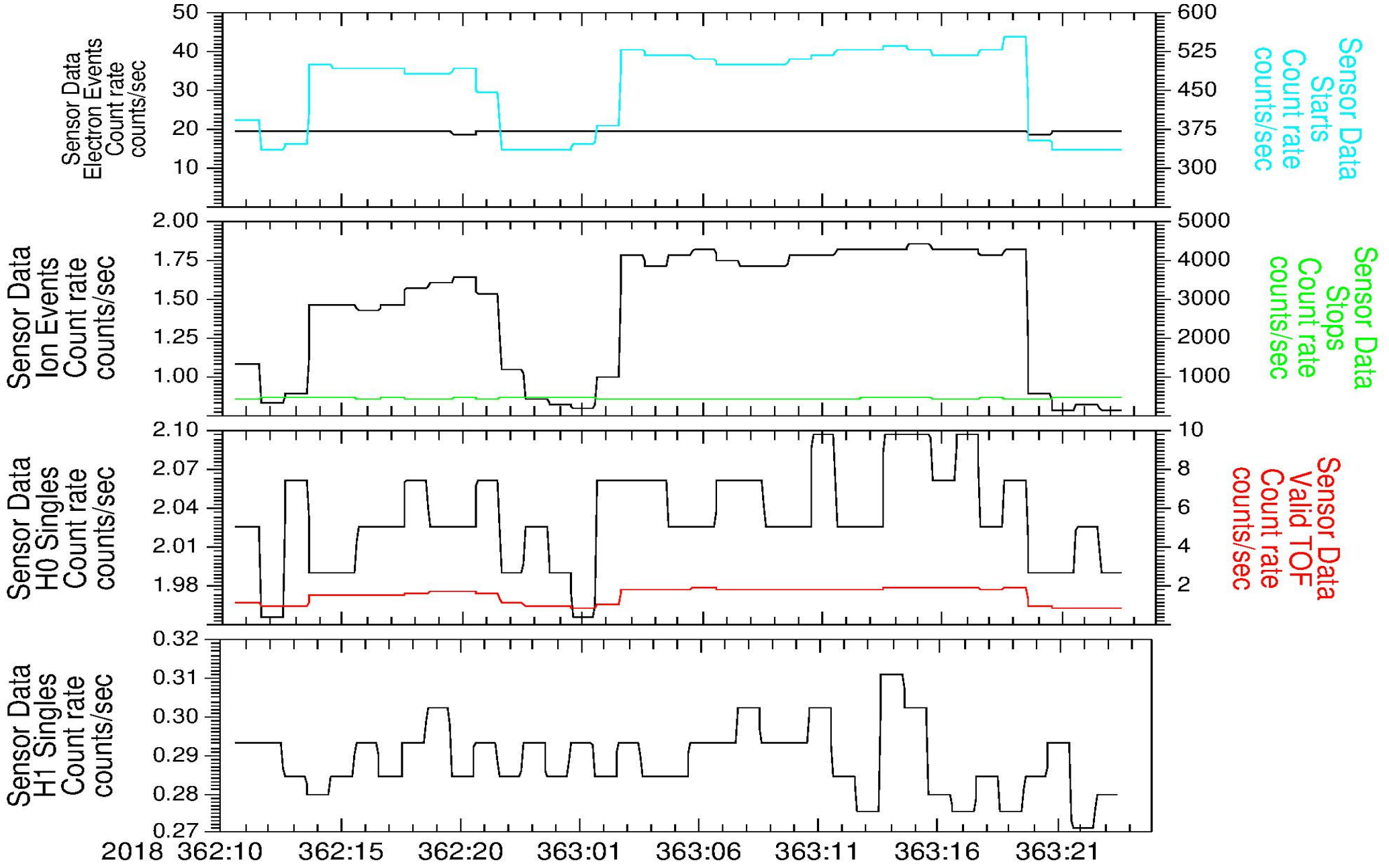

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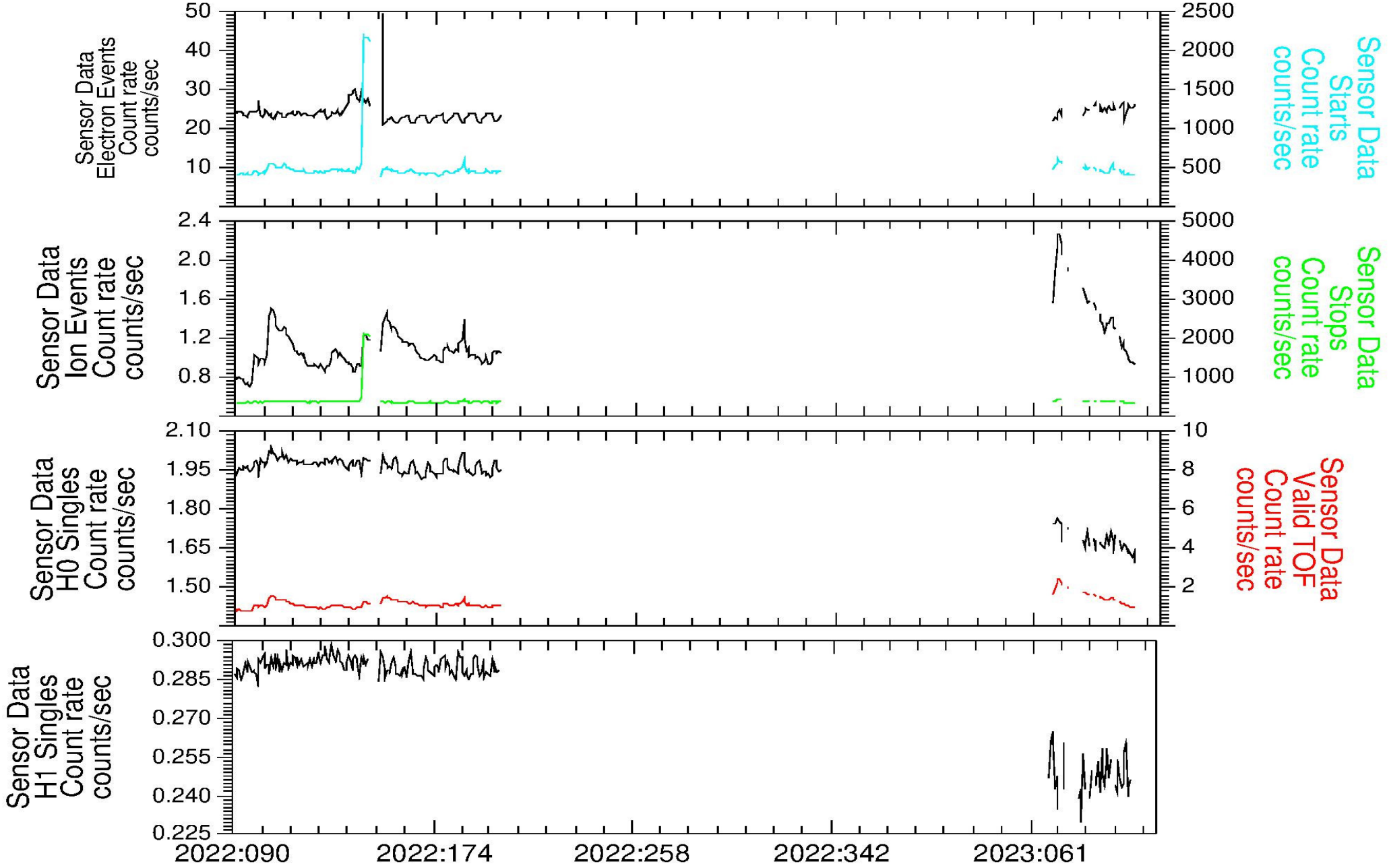

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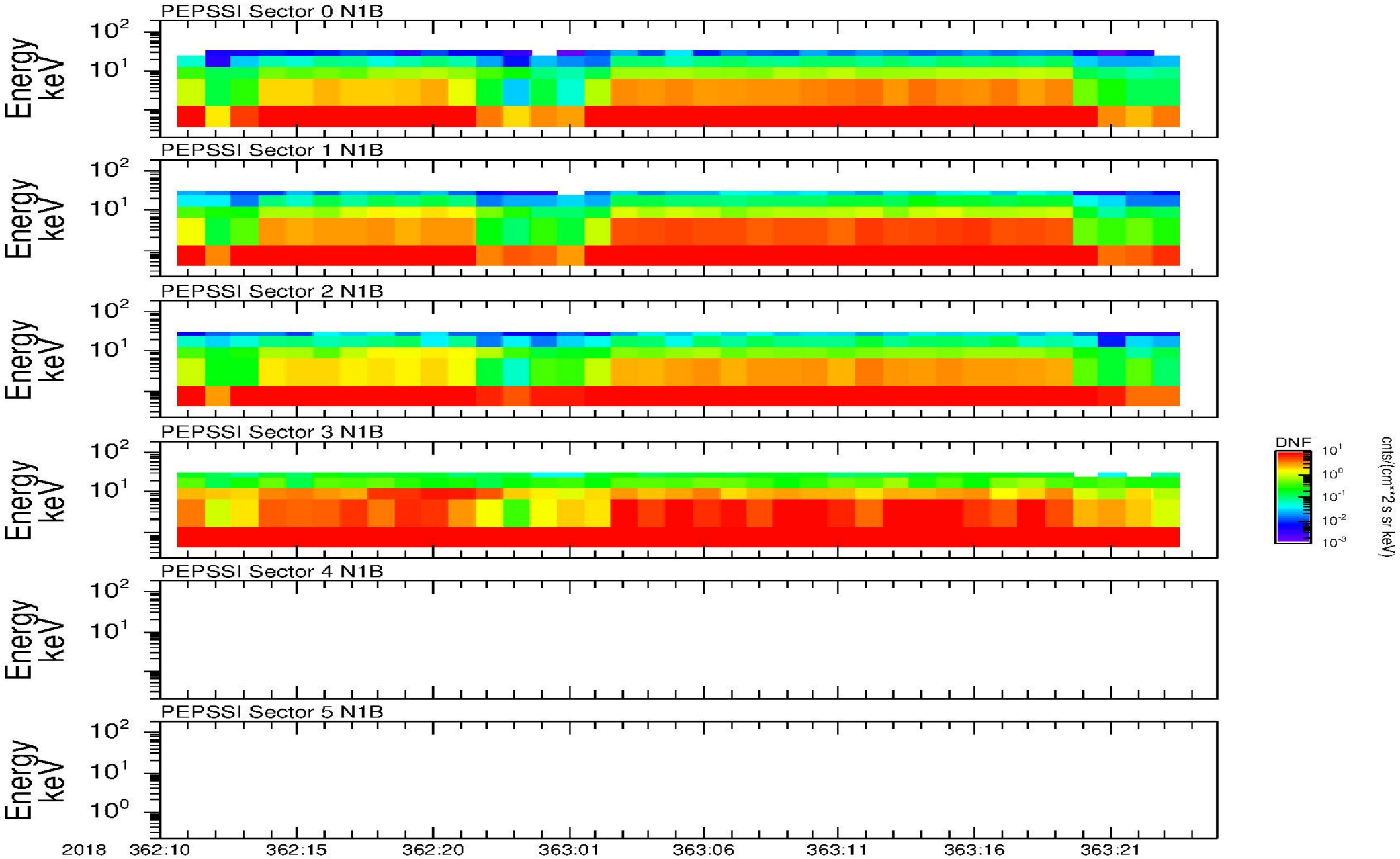
FLUXN1B Proton Flux - A



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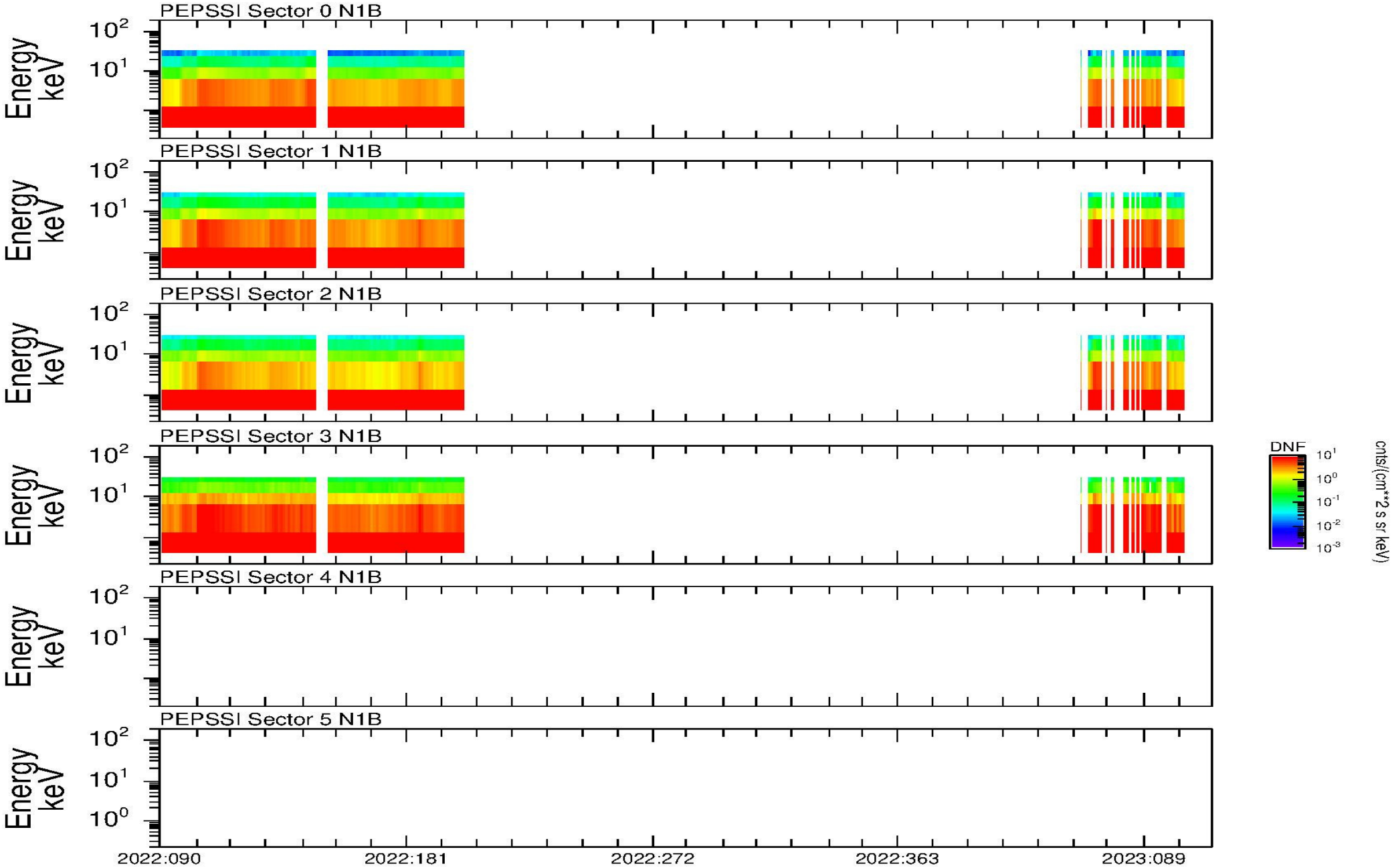

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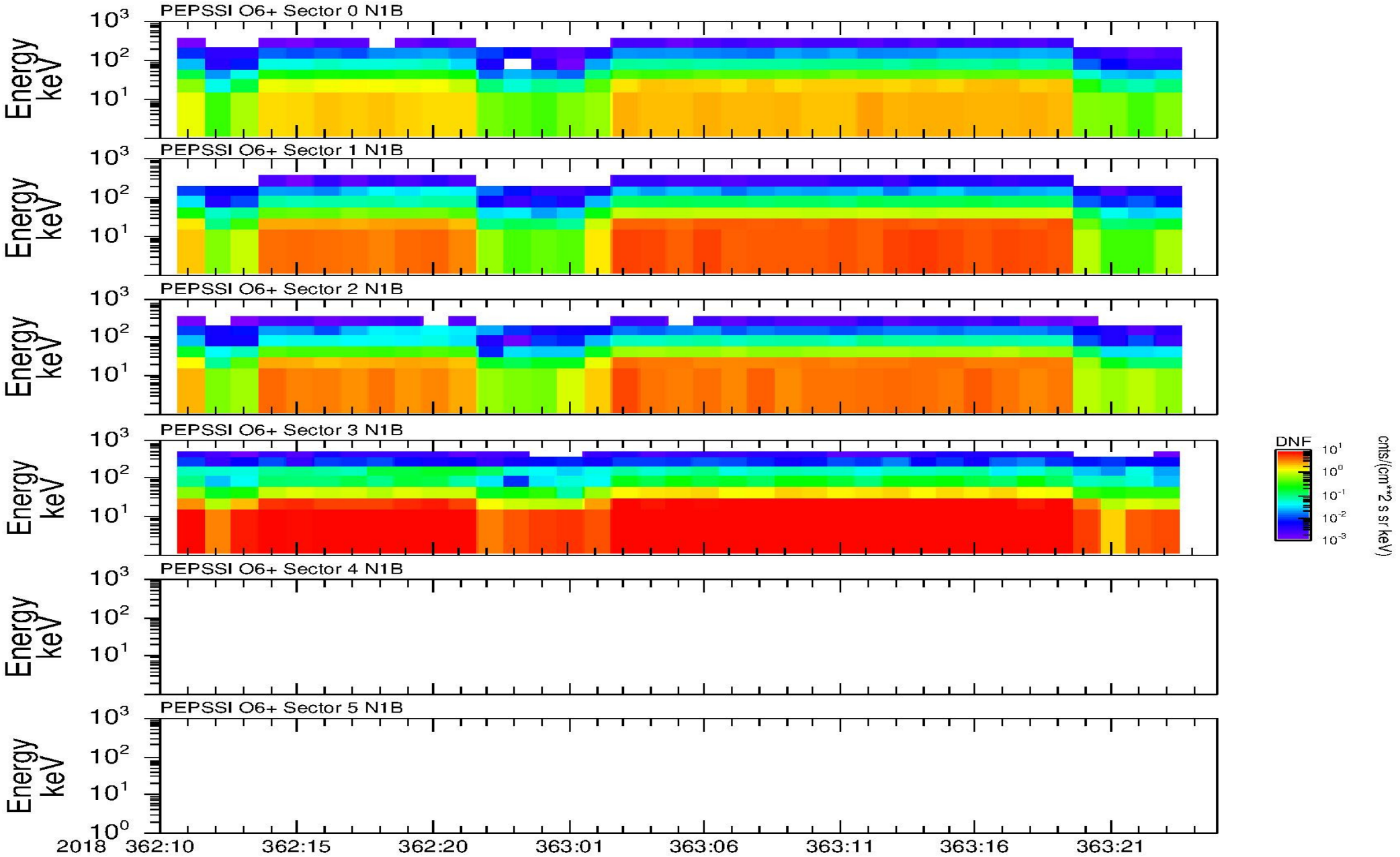
FLUXN1B Oxygen Flux - A



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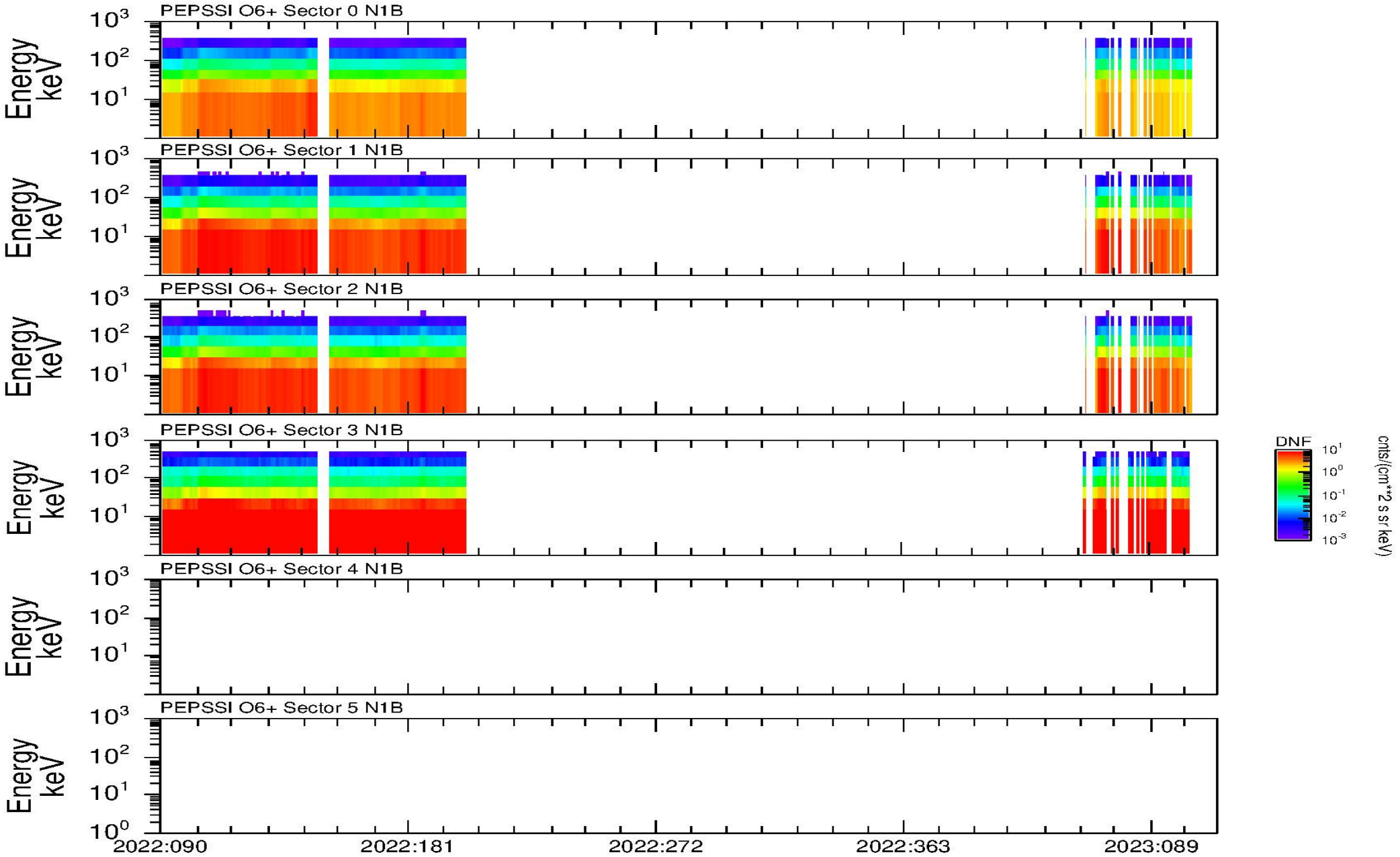
FLUXN1B Oxygen Flux - B



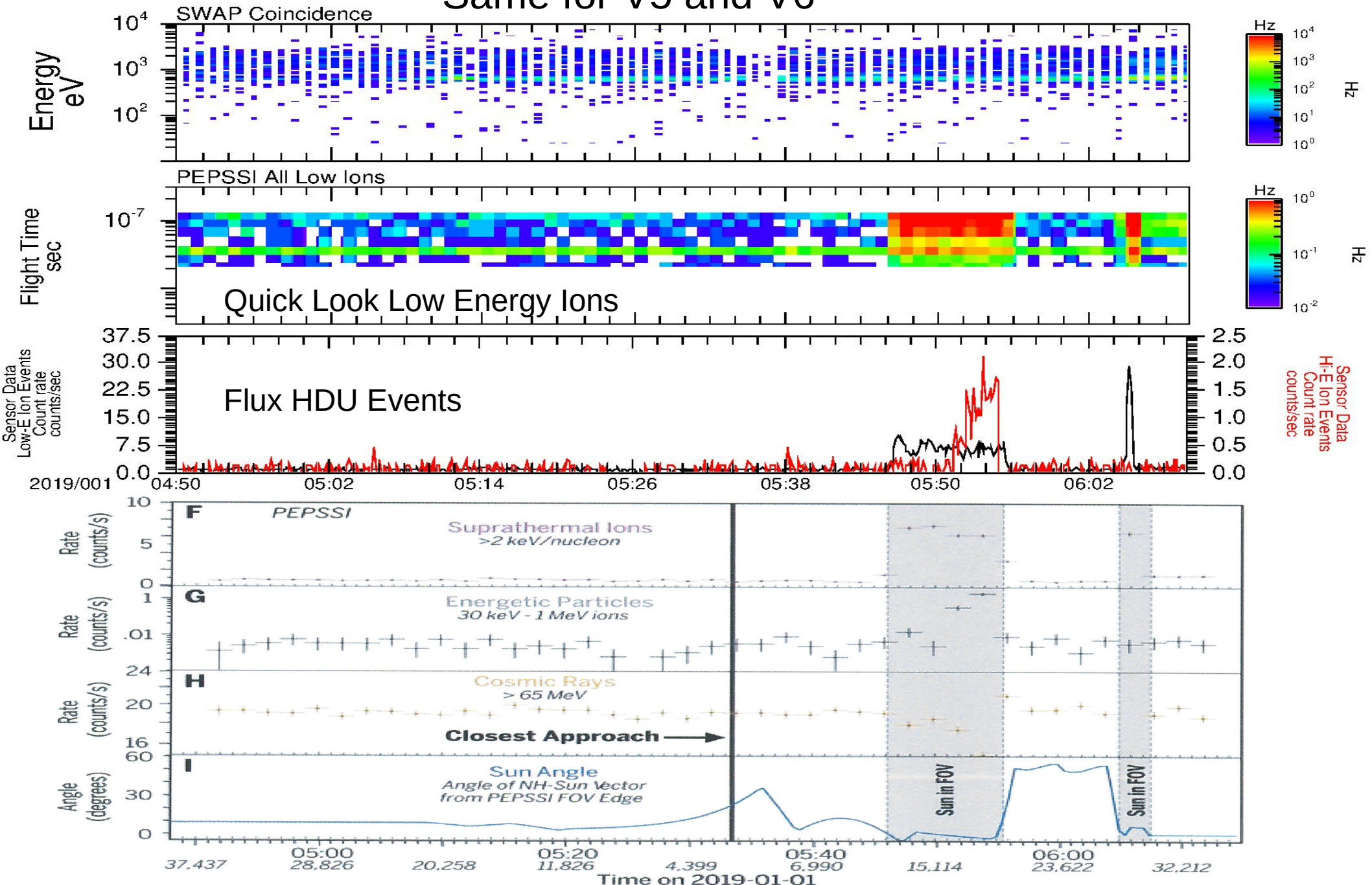
Certification
Raw and Calibrated

?

BACK-UP Slides

PEPSSI-SWAP Arrokoth Encounter – 3 of 3

Same for V5 and V6



Stern et al., Science, 2019, Figure 8

PEPSSI Electrons - 3

Why are the fluxes from PEPSSI abnormally high?