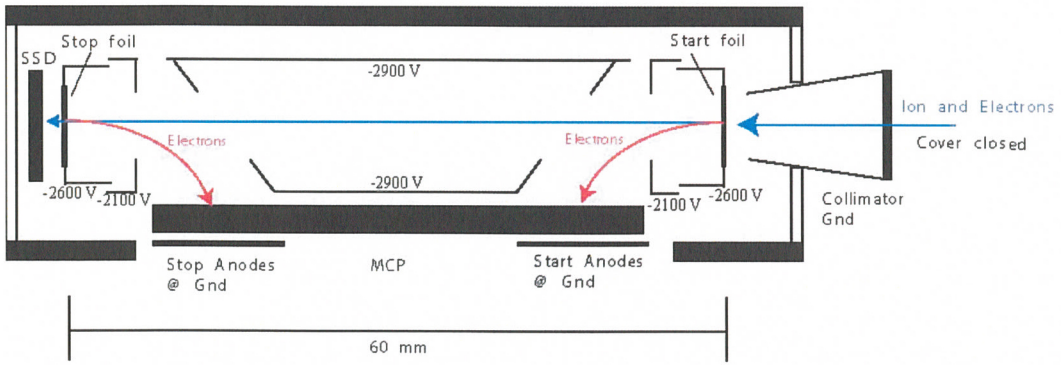
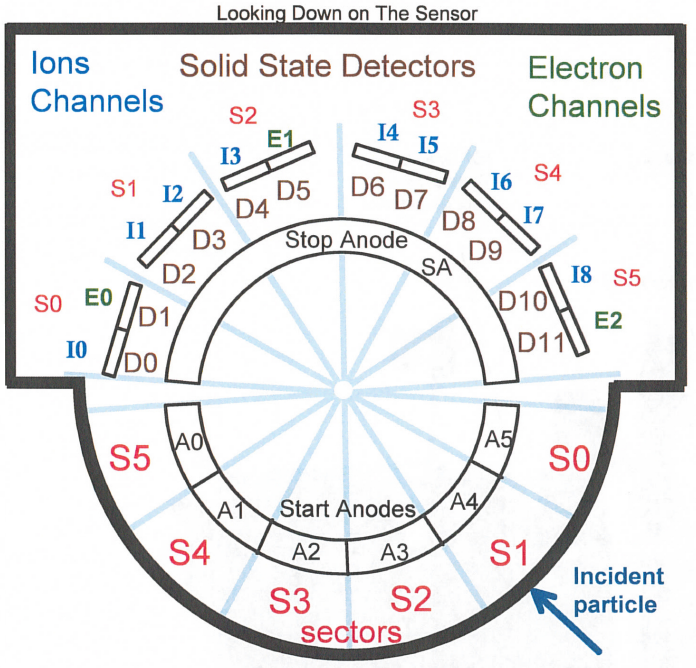
New Horizons Pluto Energetic Particle Spectrometer Science Investigation (PEPSSI)

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

GOOD

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

GOOD

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

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

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

GOOD

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

GOOD

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

GOOD

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

GOOD

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

GOOD

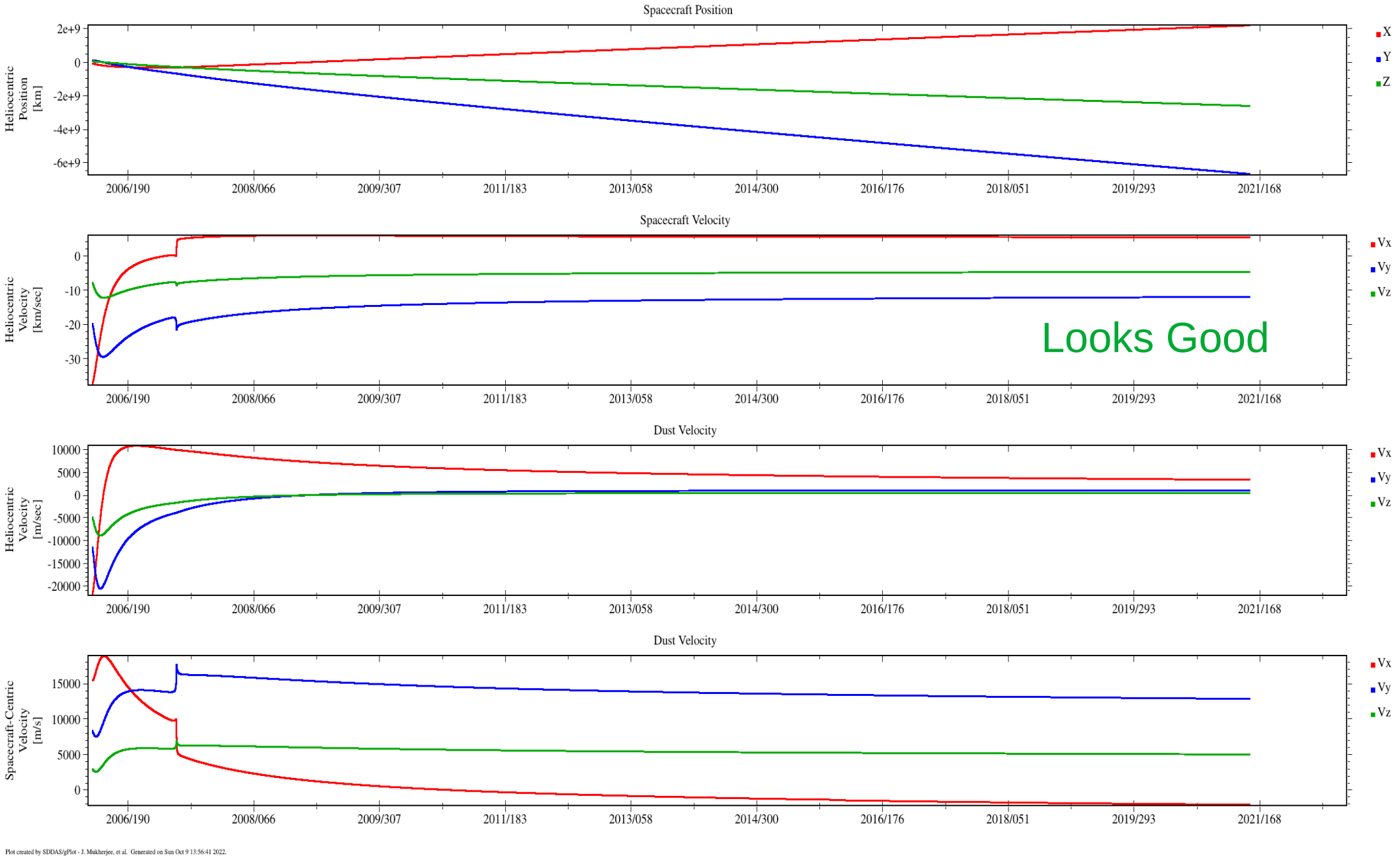
nh-x-pepssi-4-plasma-v1.0/document
nh_met2utc.lbl
nh_met2utc.tab

GOOD, updated

nh-x-pepssi-4-plasma-v1.0/document
nh_mission_trajectory.lbl

GOOD, new

nh-x-pepssi-4-plasma-v1.0/document
nh_mission_trajectory.tab



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payload_ssr.lbl
payload_ssr.pdf

GOOD

GOOD

GOOD, new

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GOOD, new

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GOOD

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indxinfo.txt

GOOD

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

GOOD

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

GOOD

PEPSSI RESAMPLED
Data Evaluation

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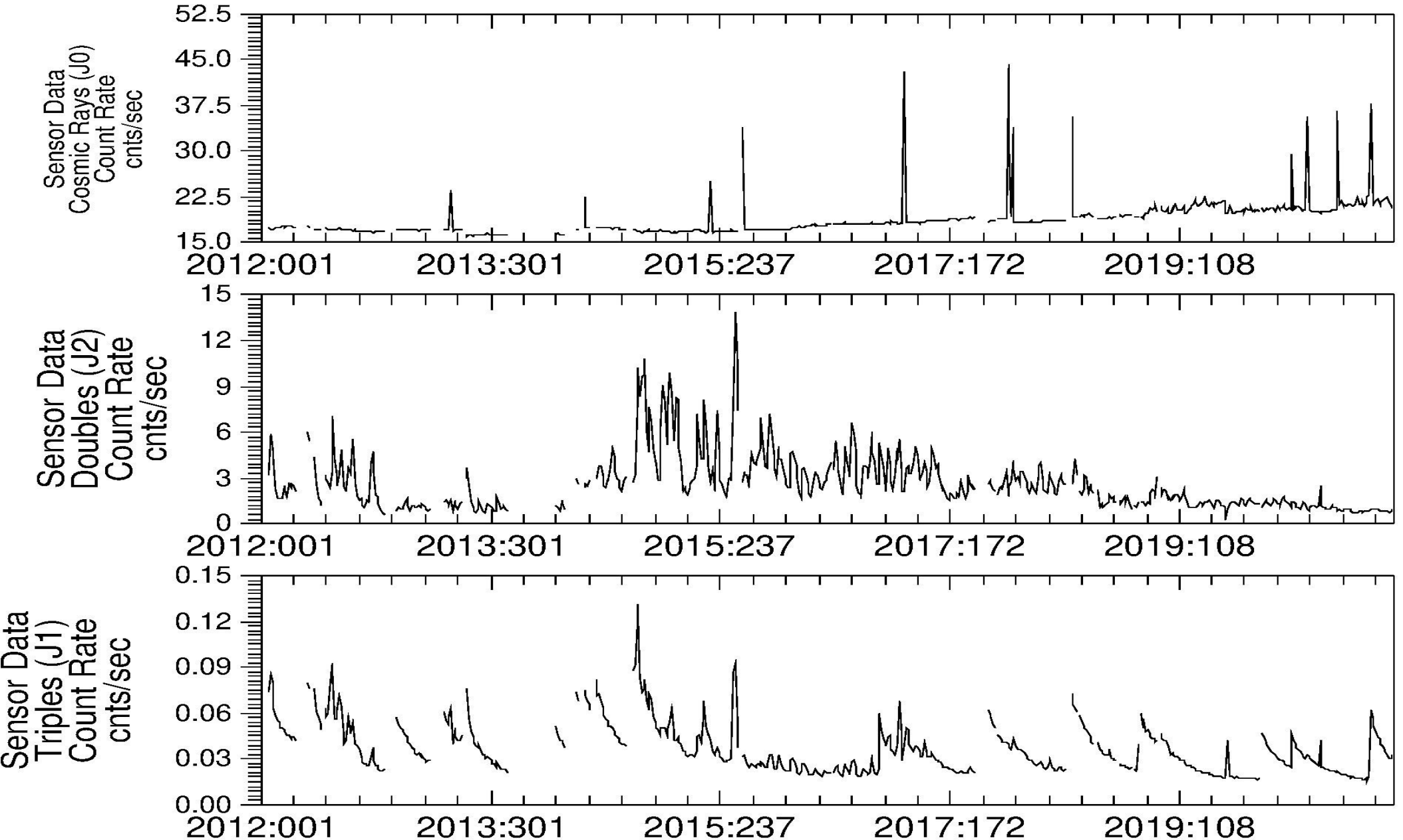

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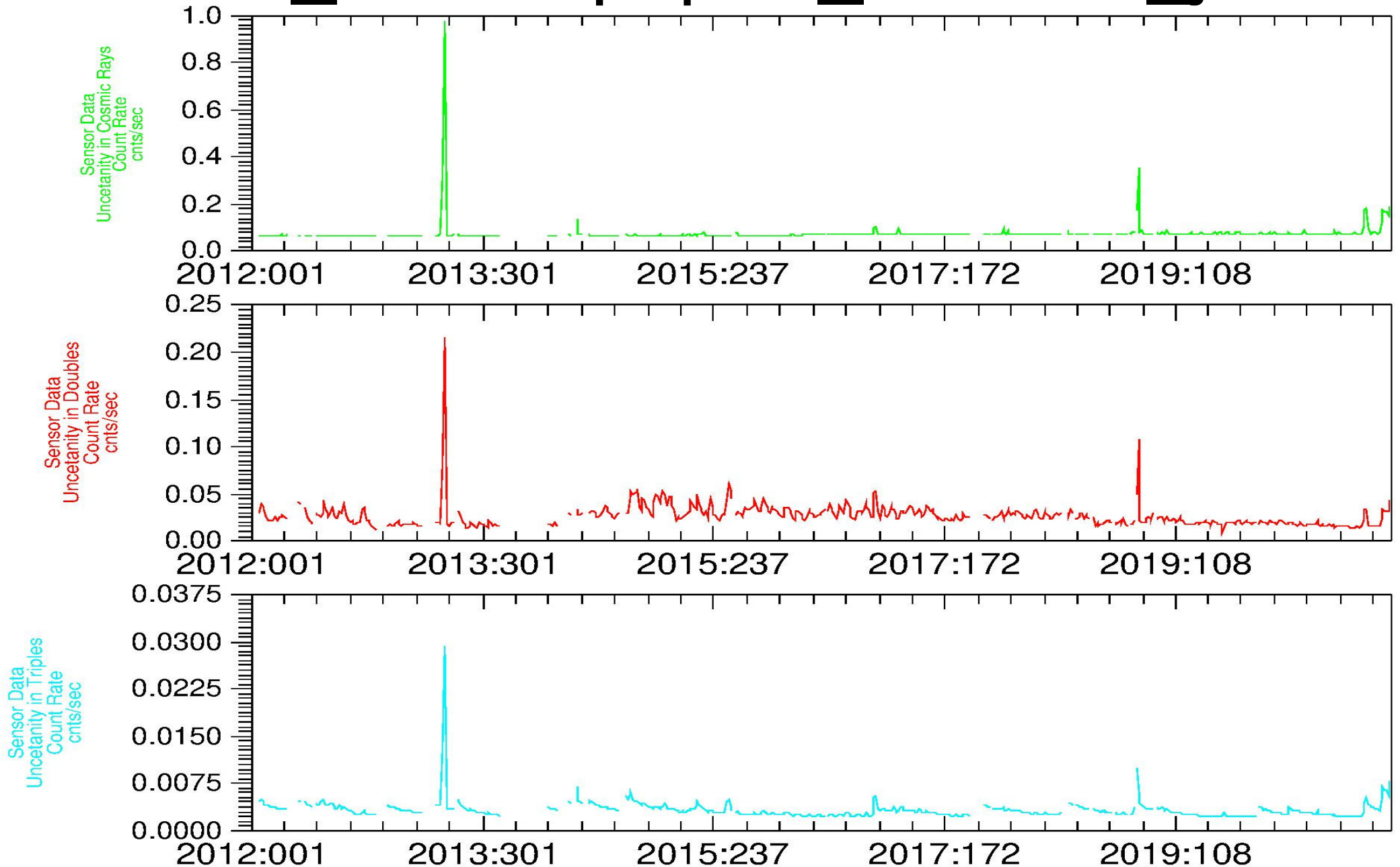

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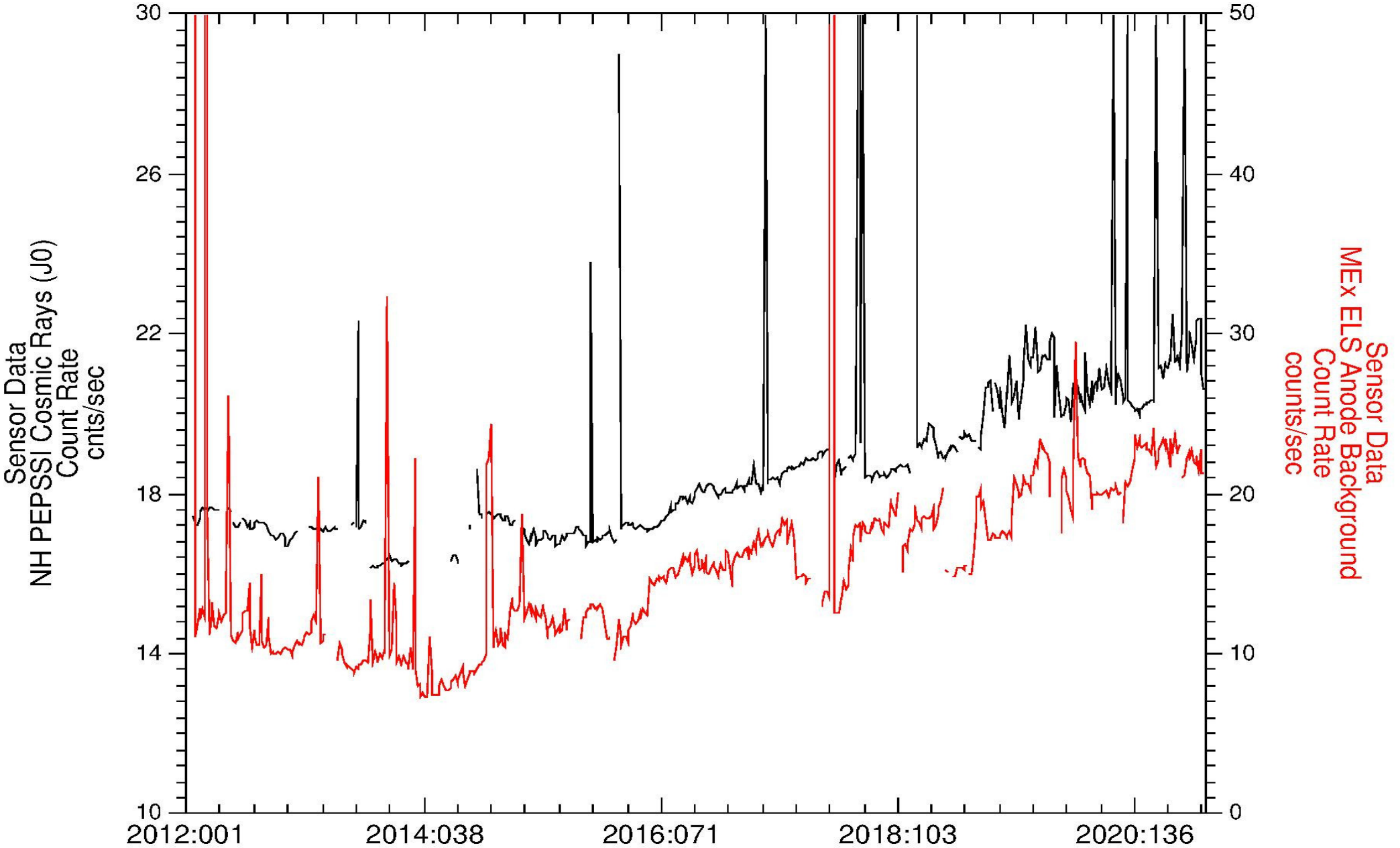

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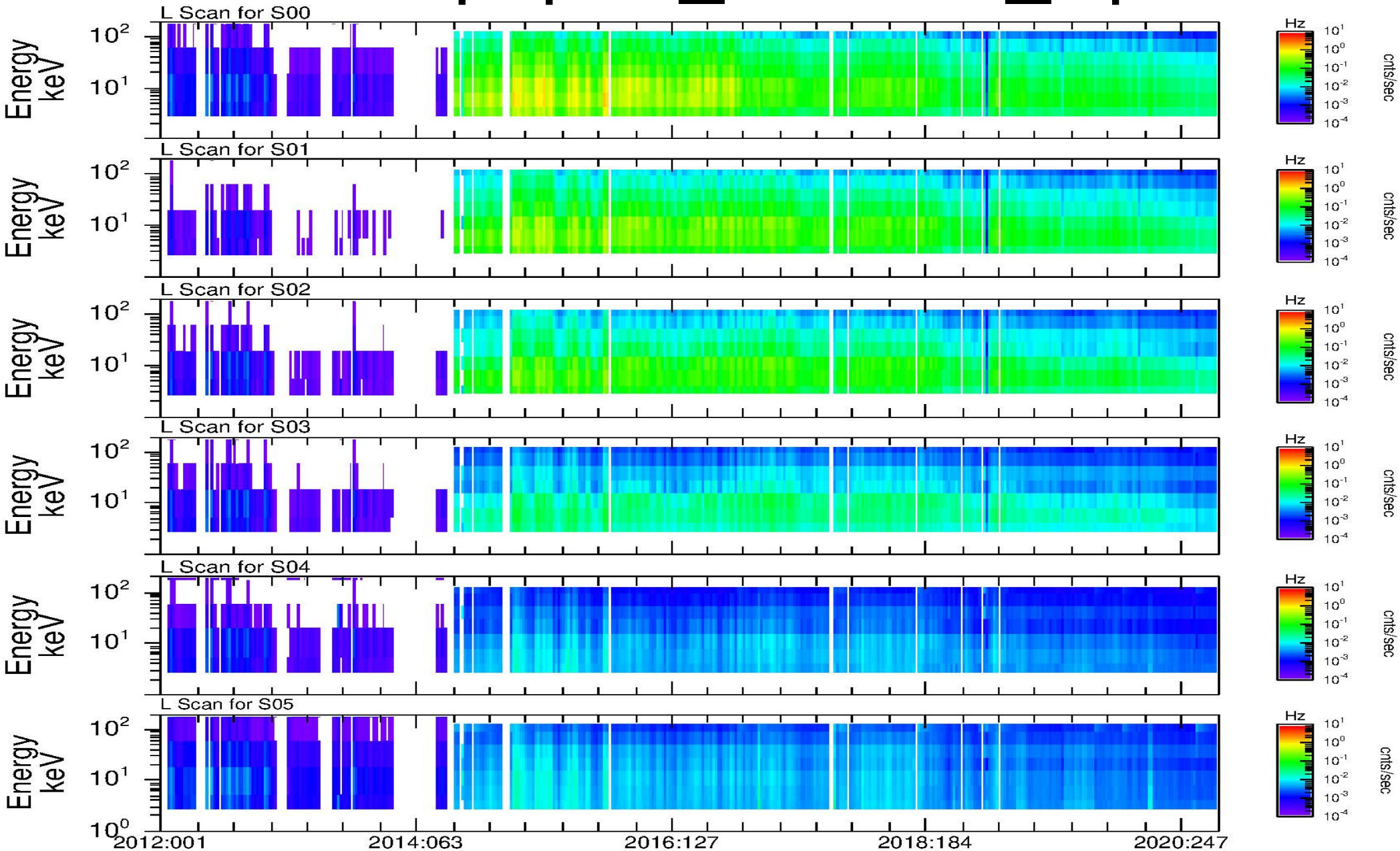

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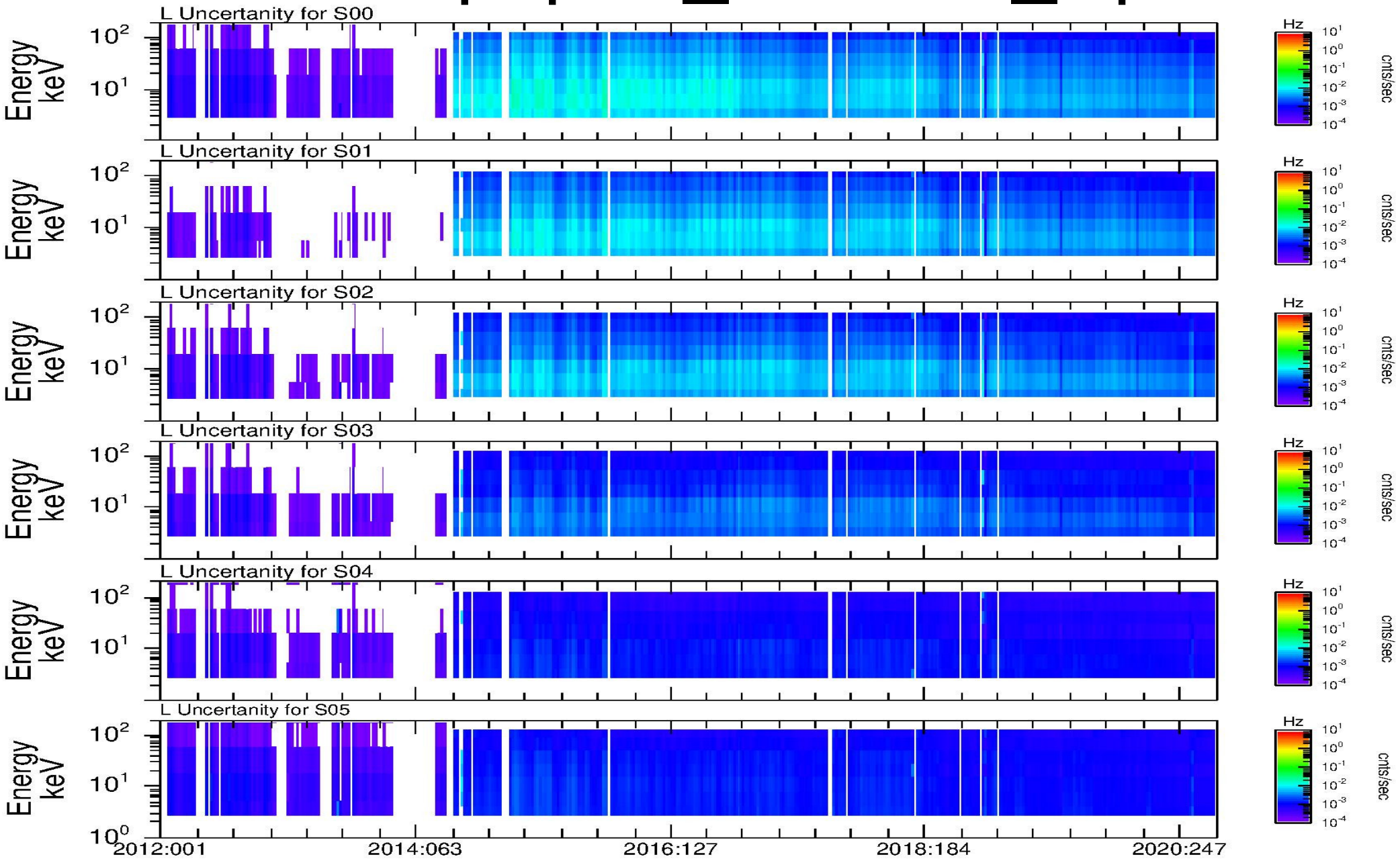

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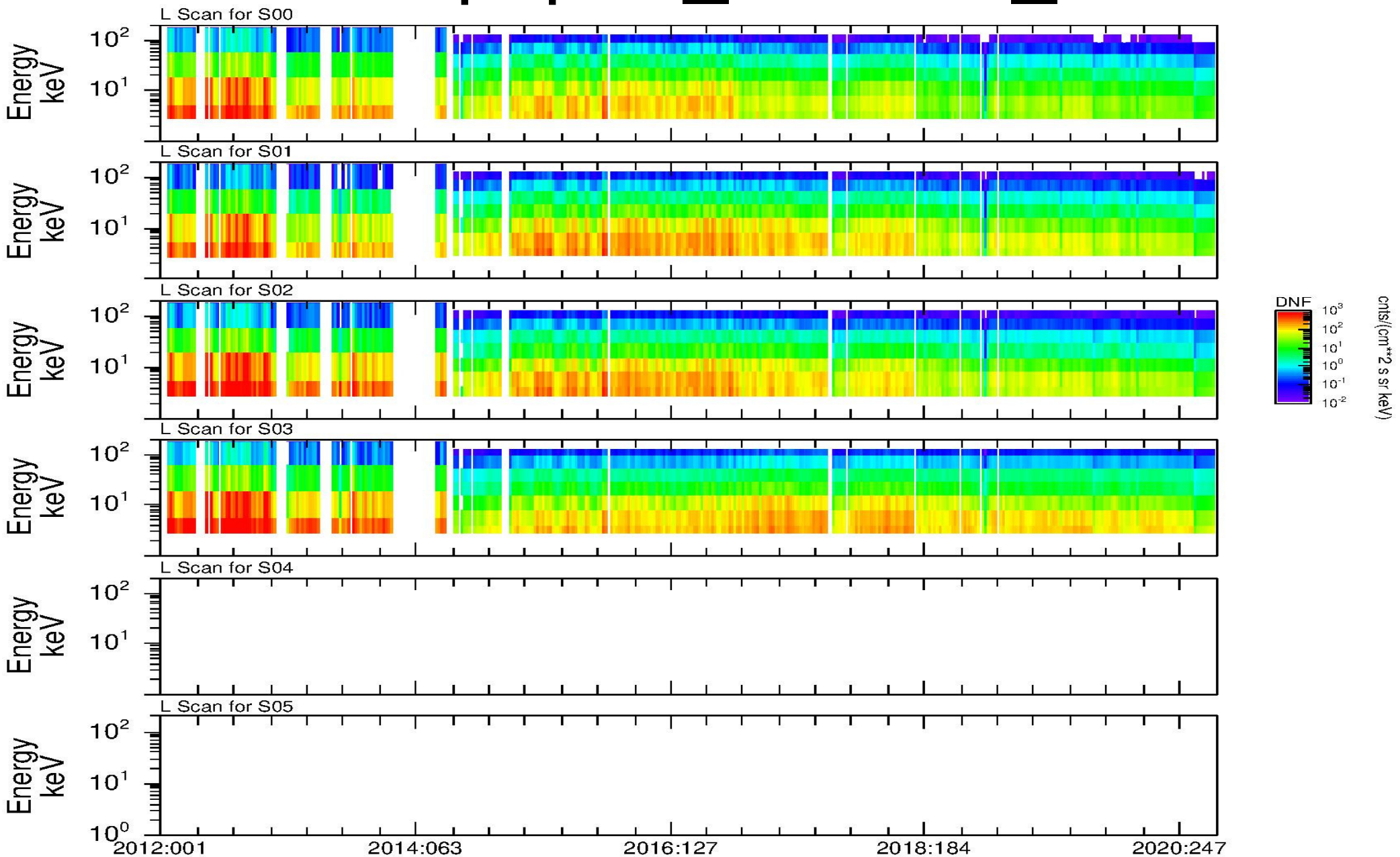

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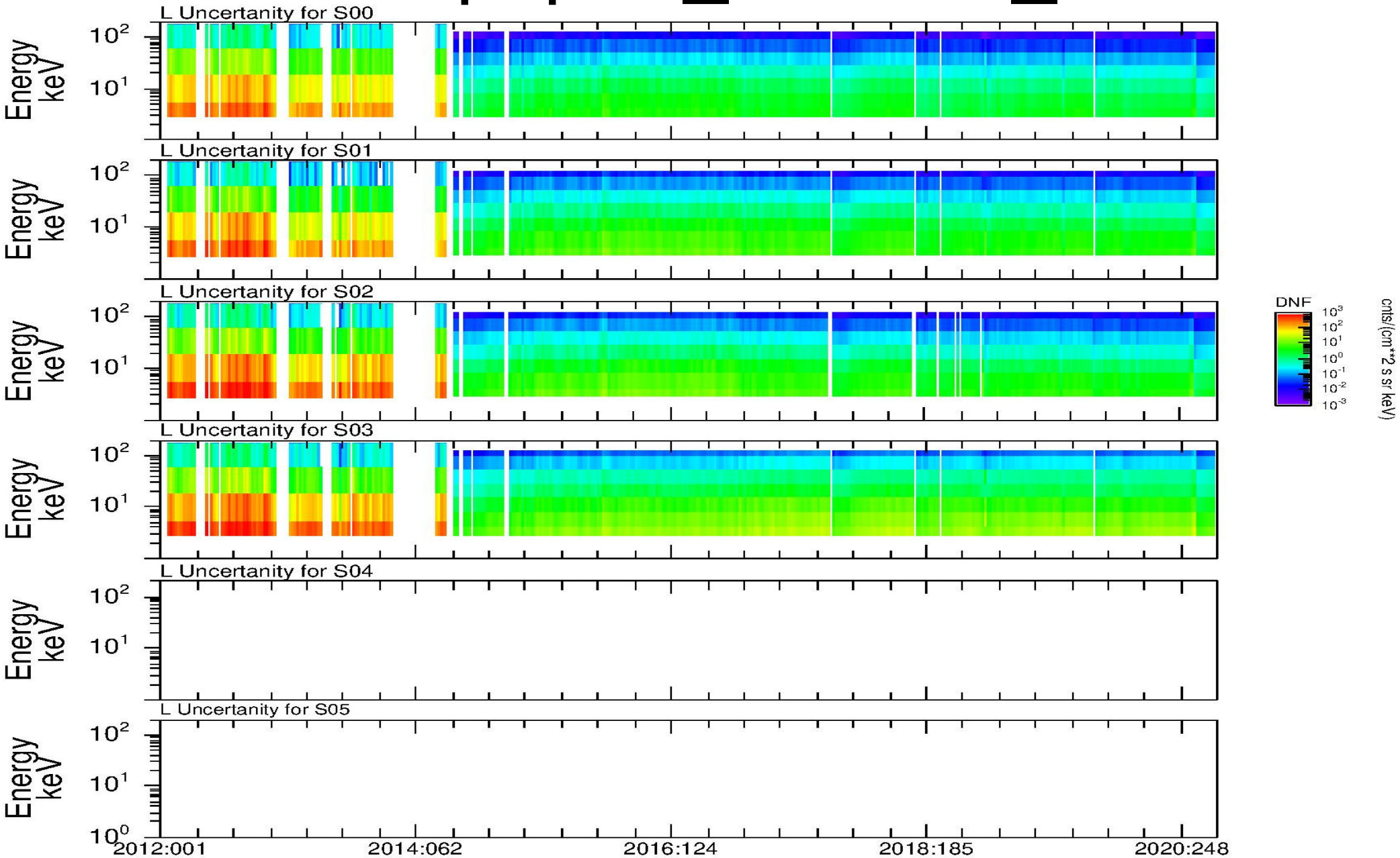

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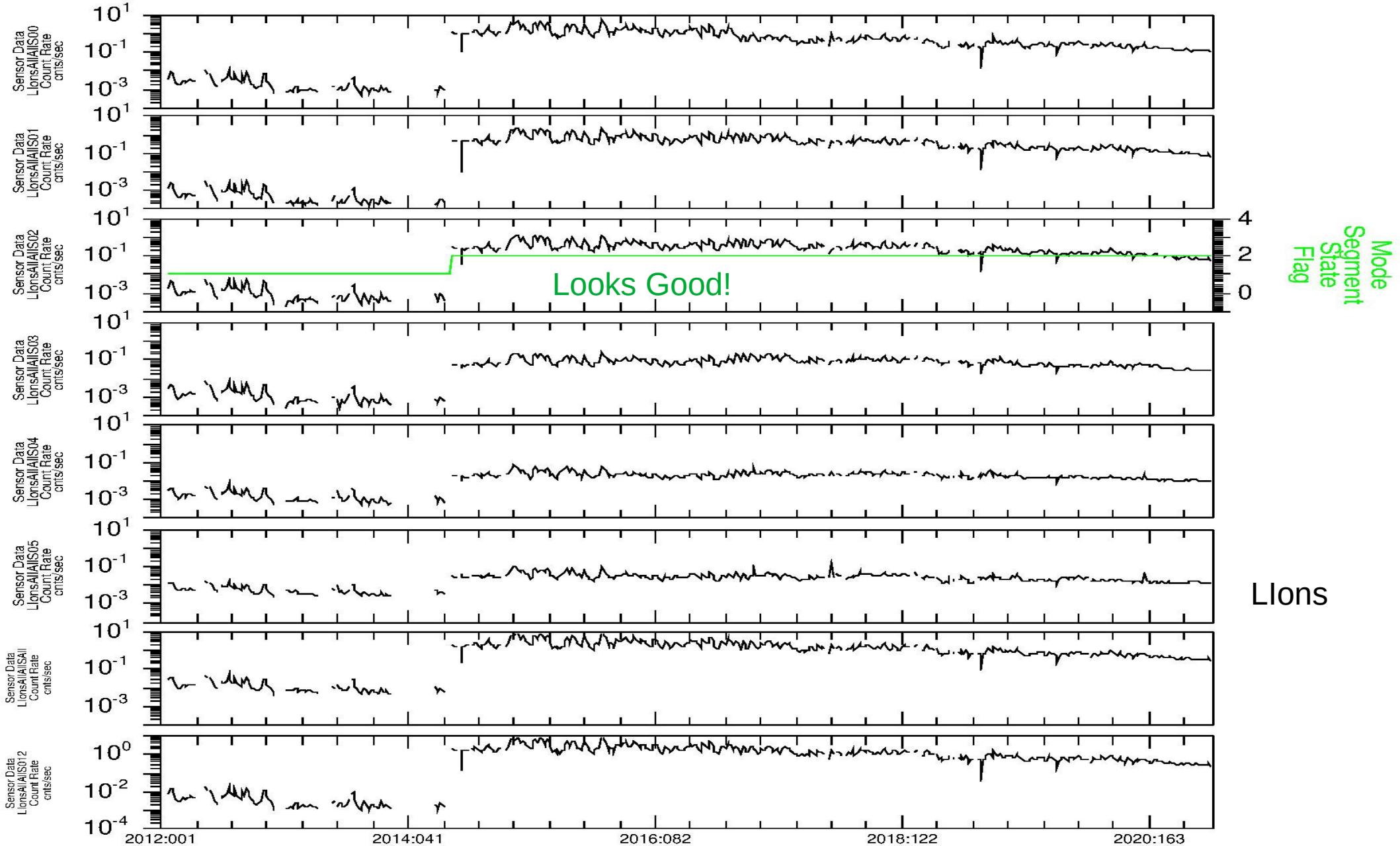

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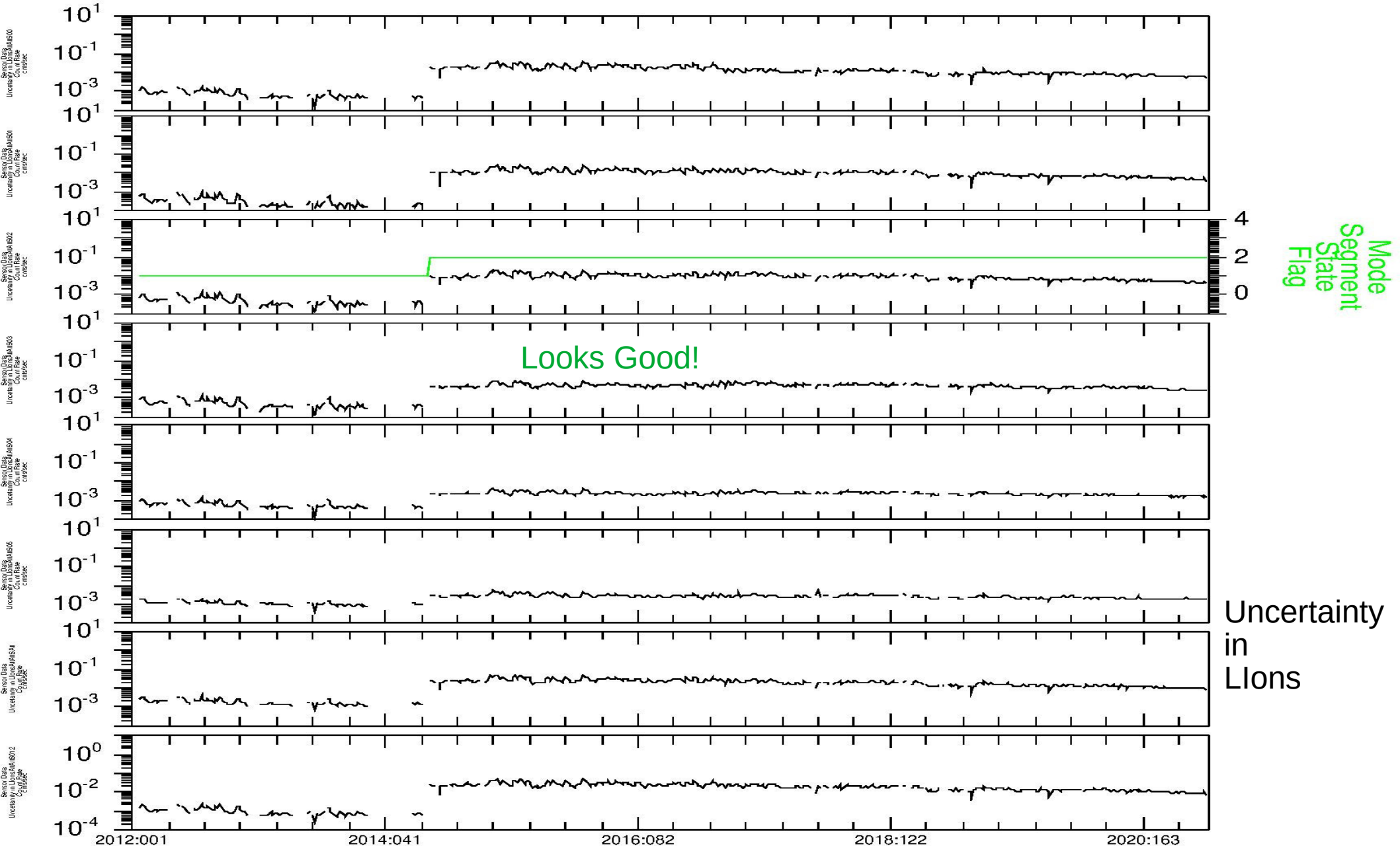

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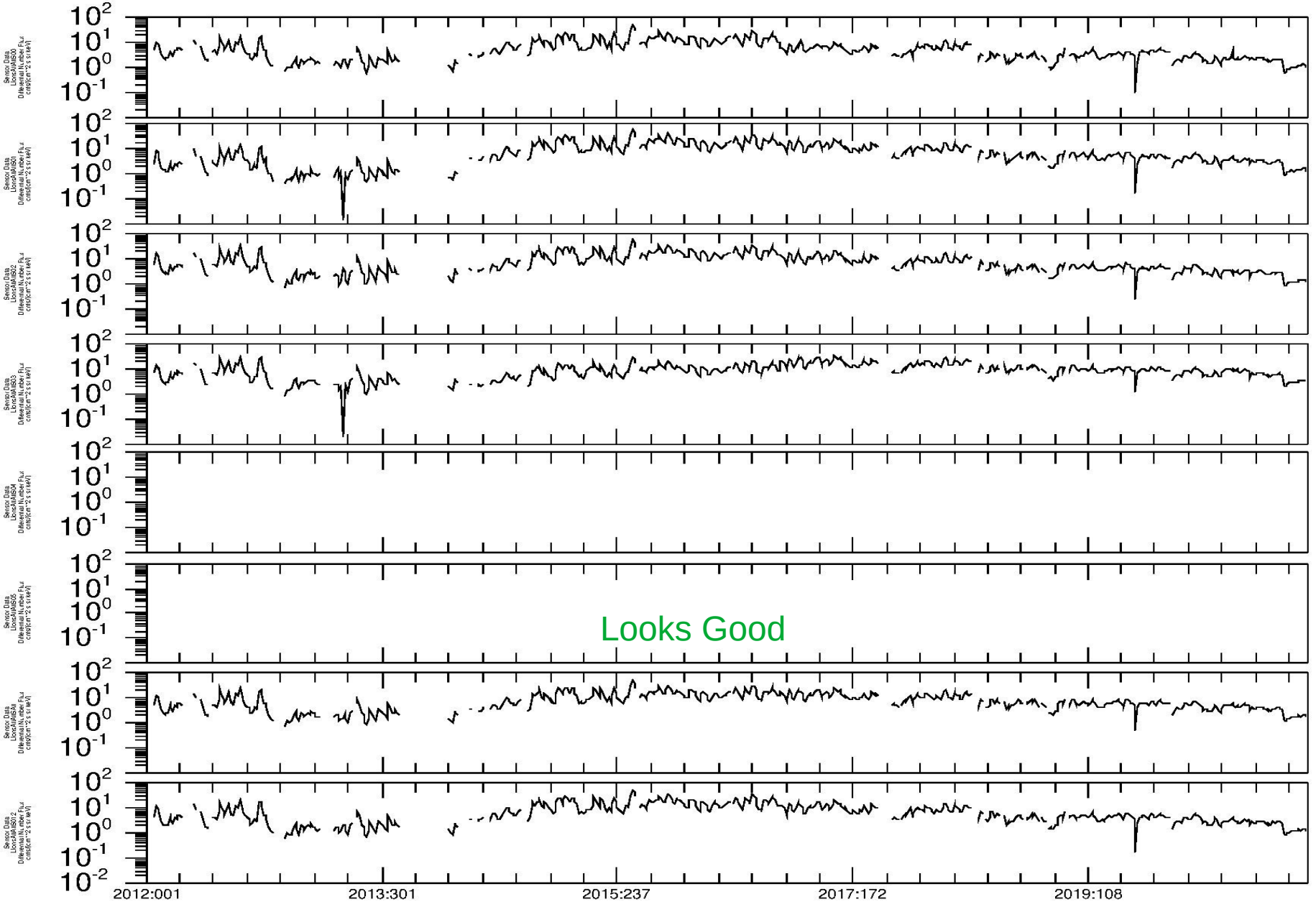

LIons

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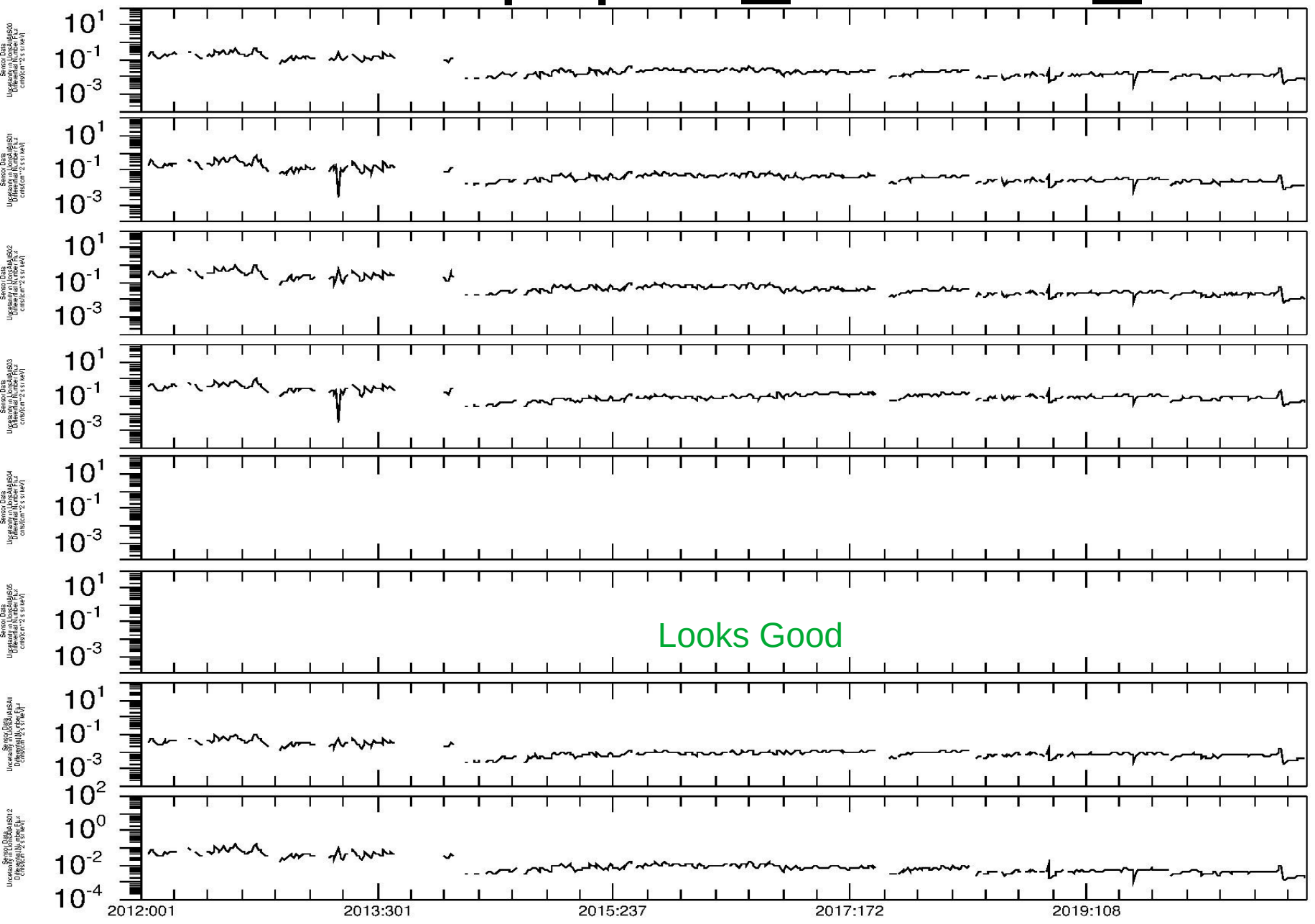

Uncertainty in LIons

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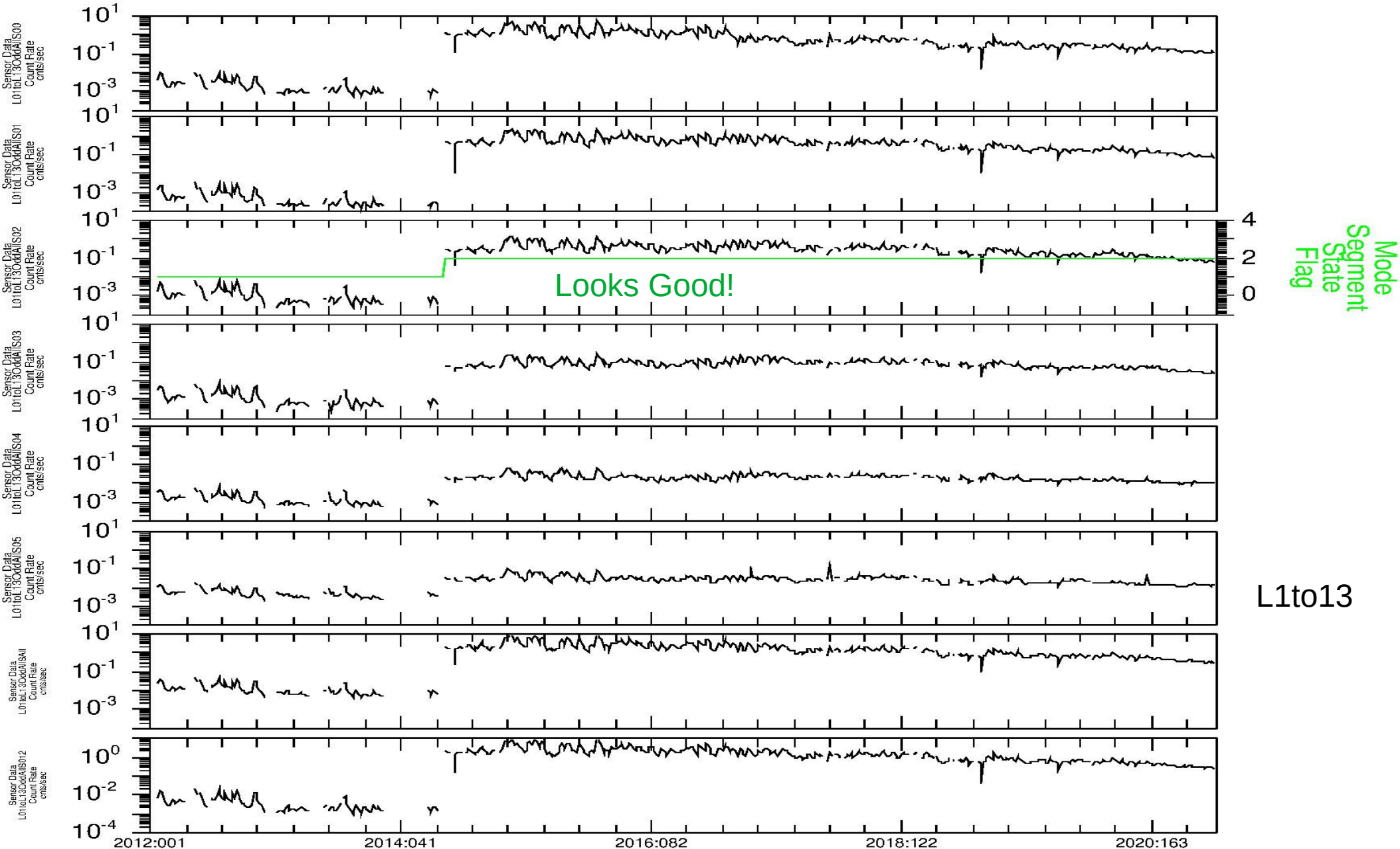

L1to13

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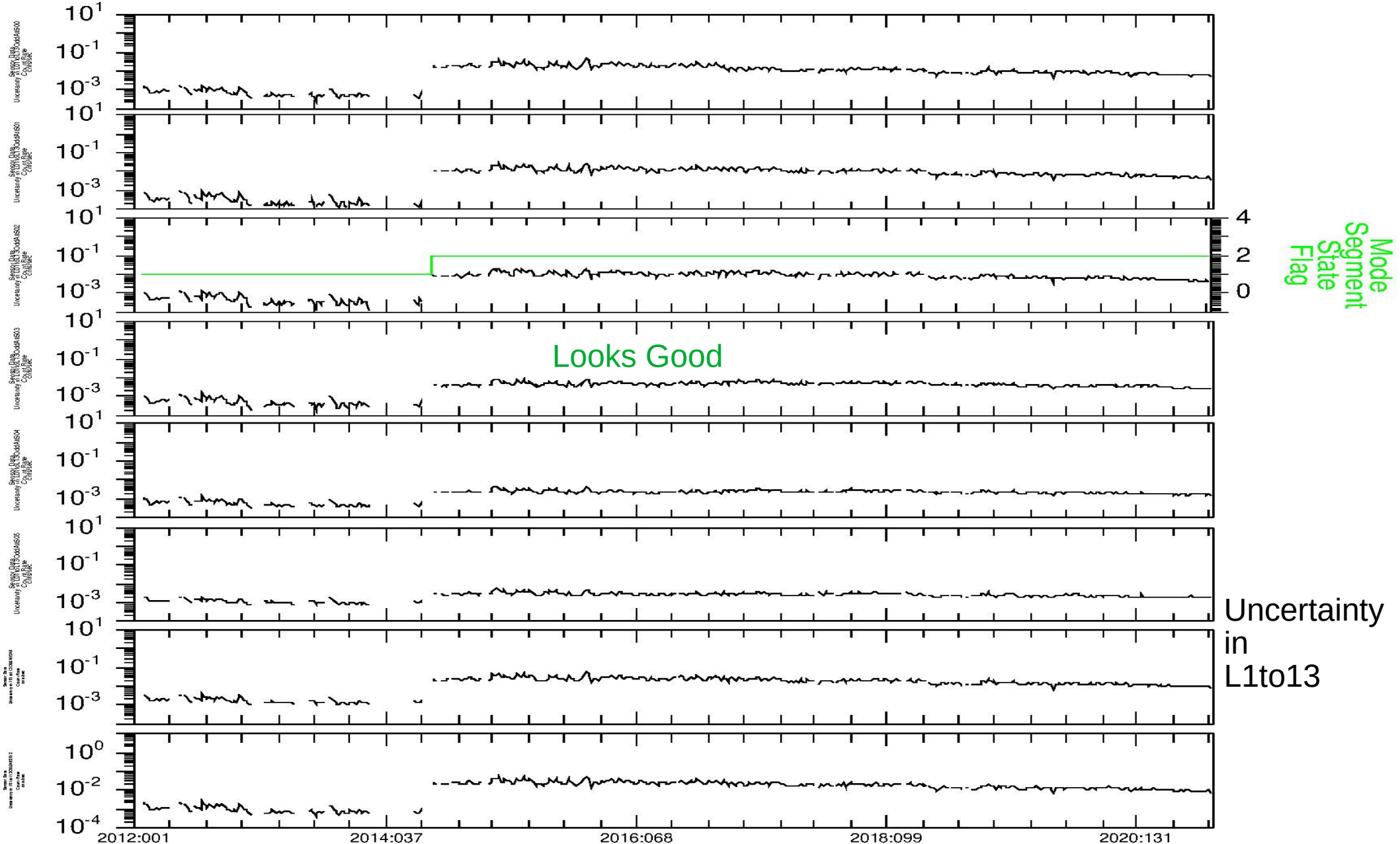

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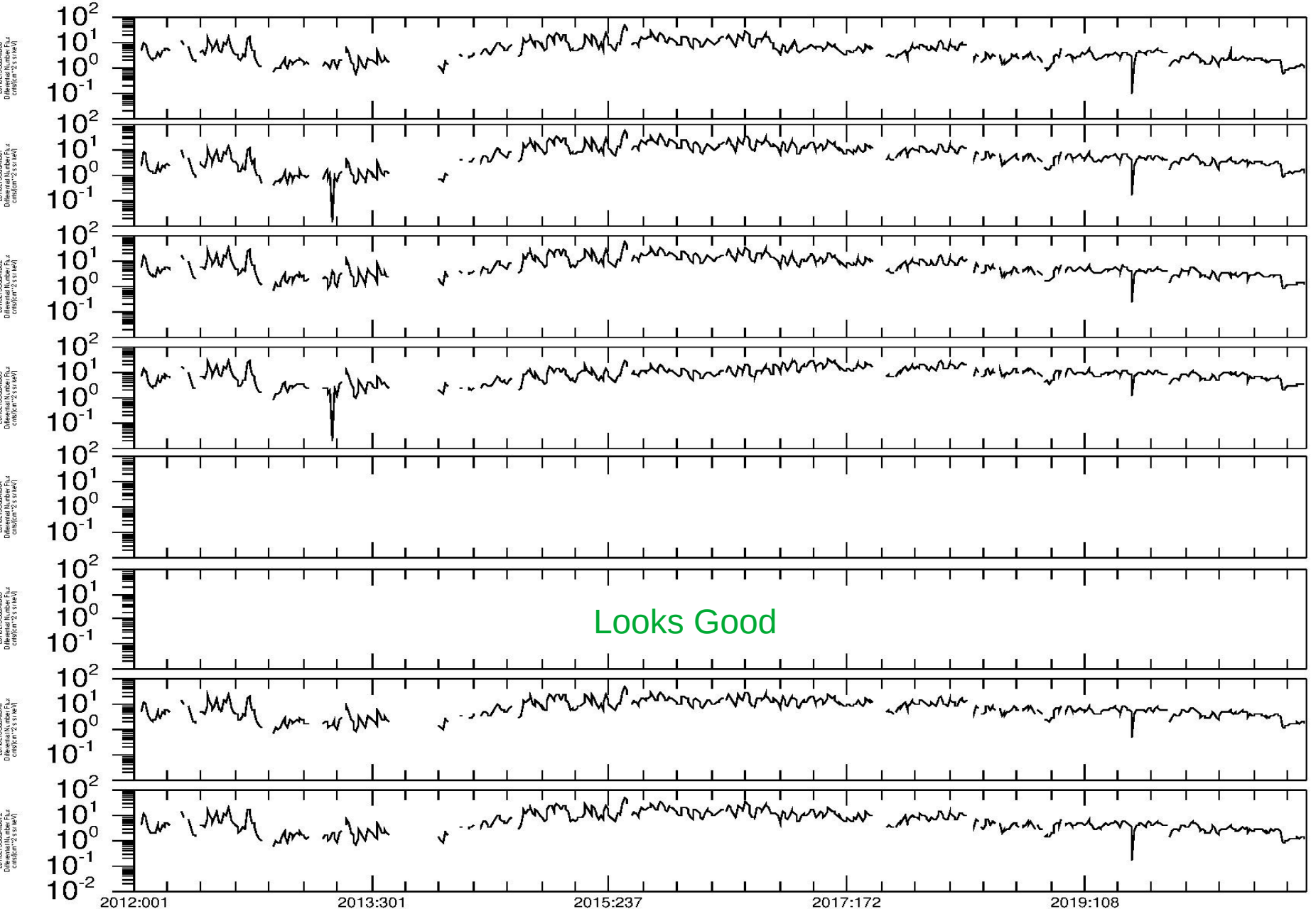

L1to13

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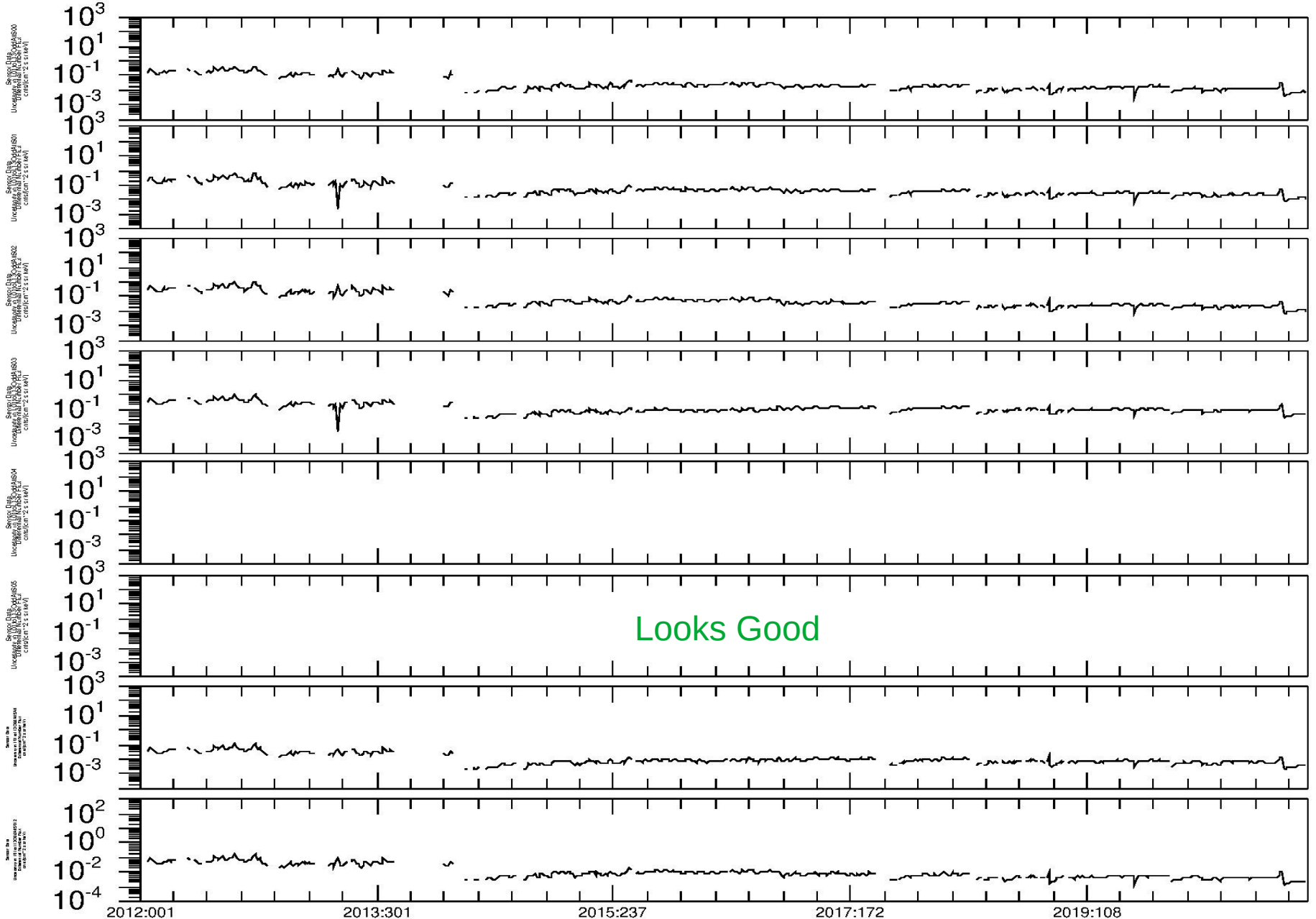

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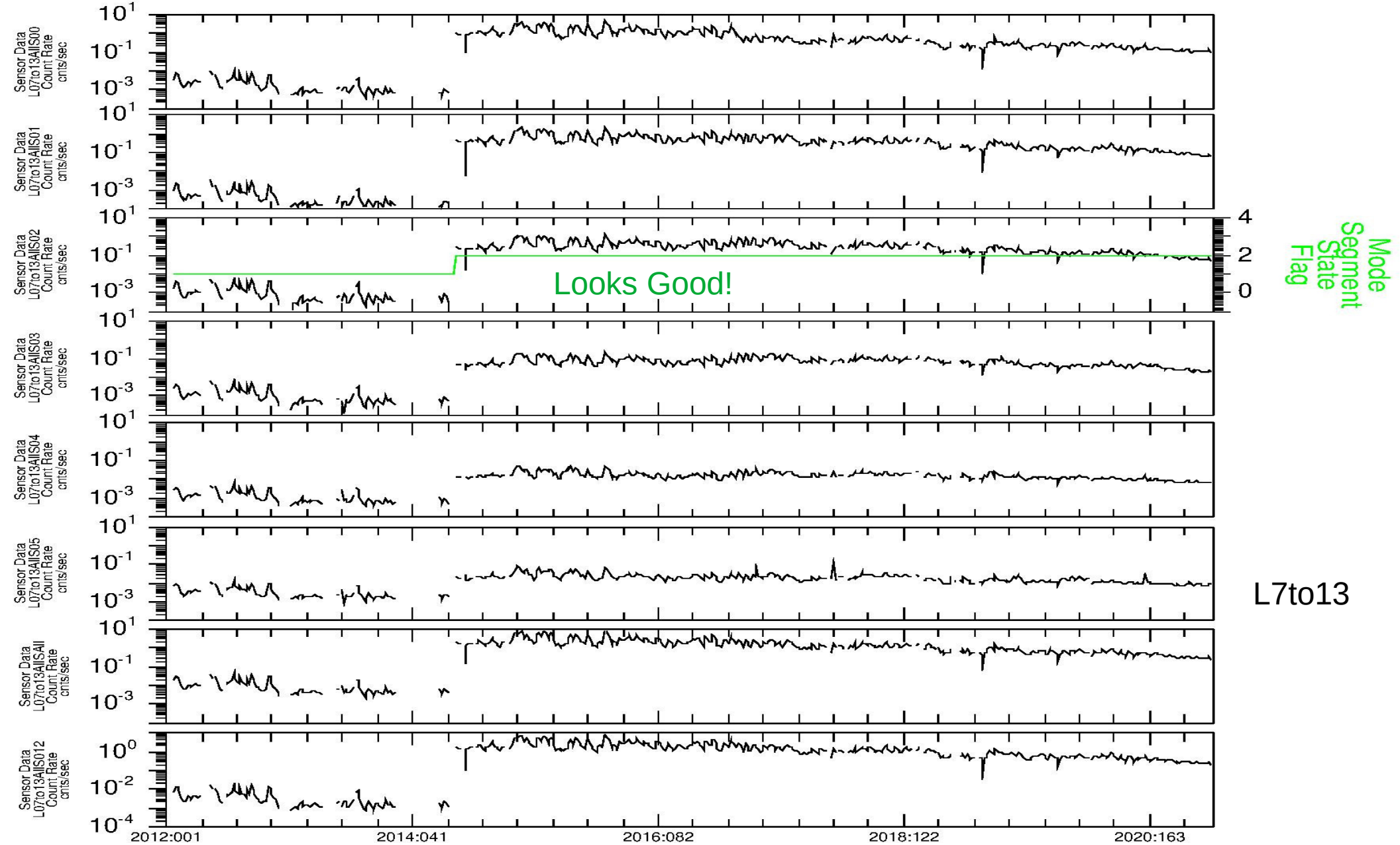

L7to13

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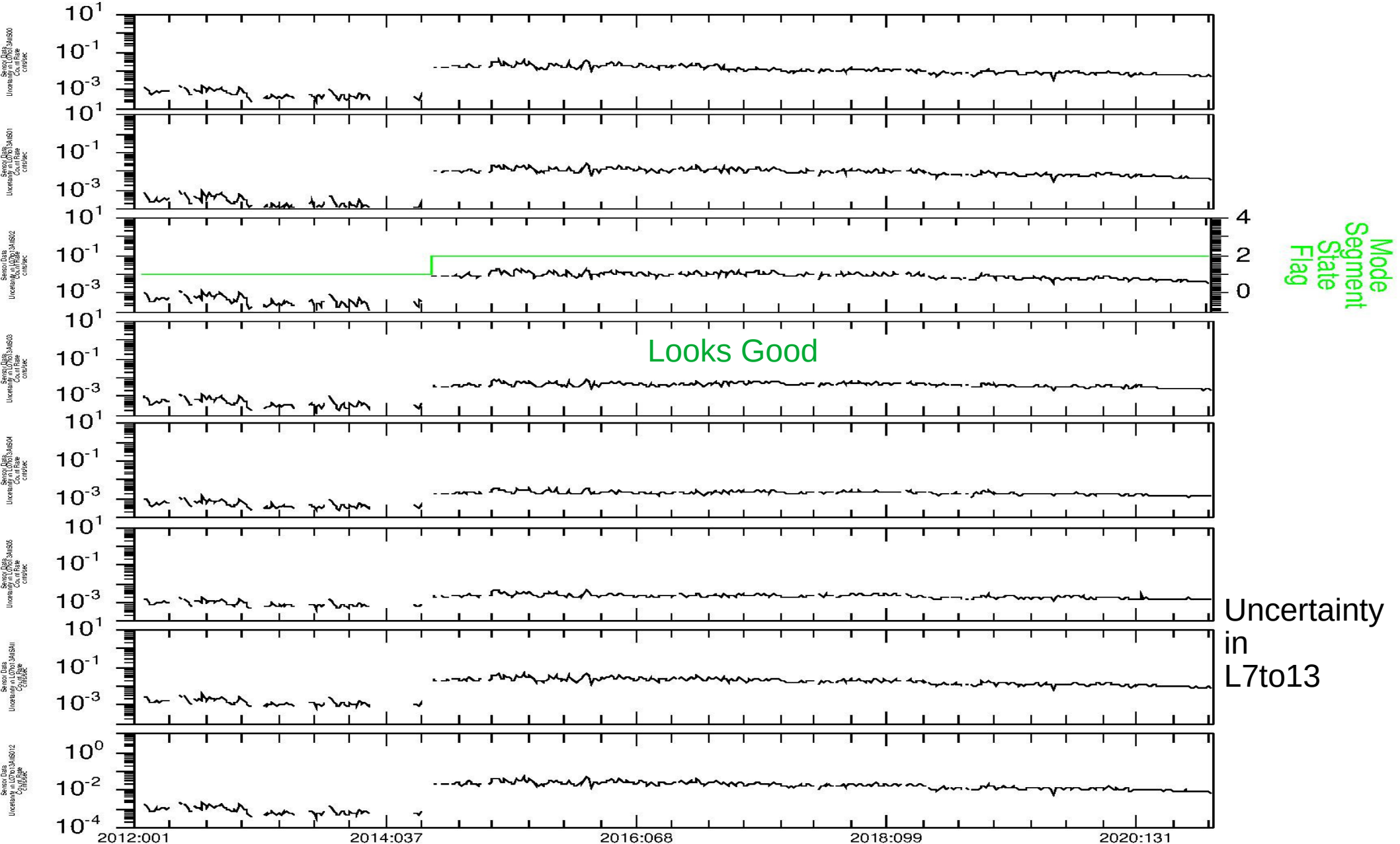

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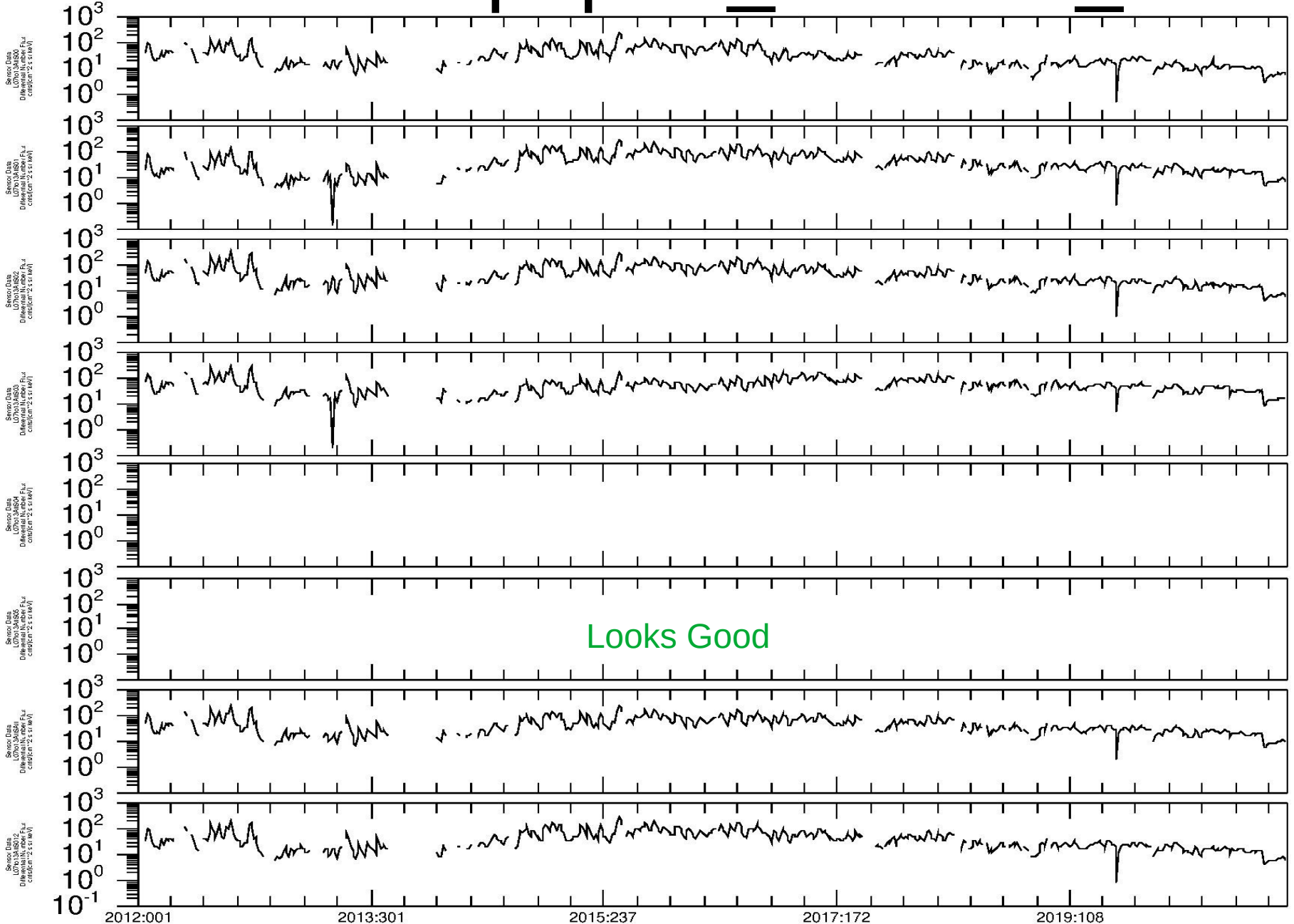

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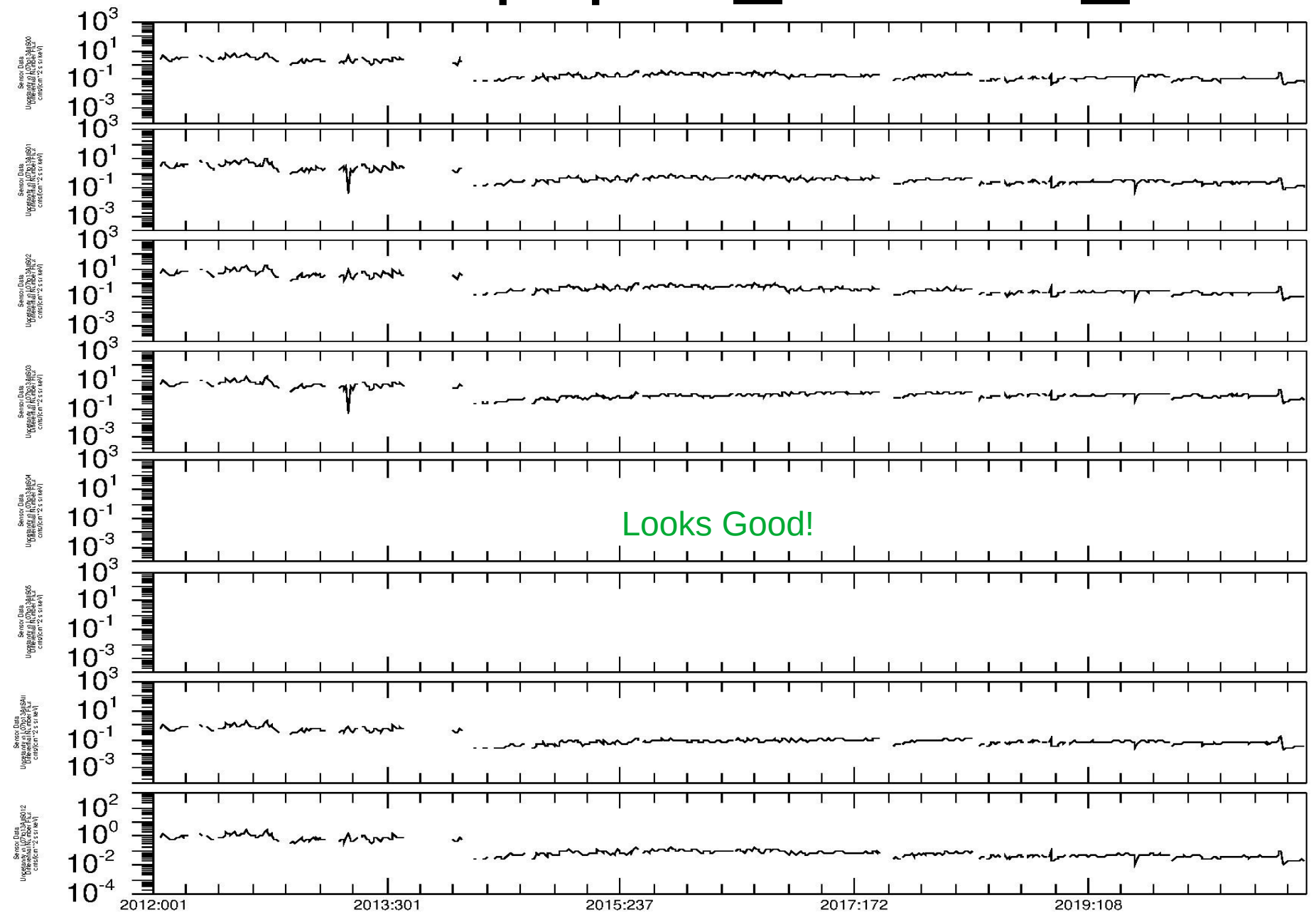
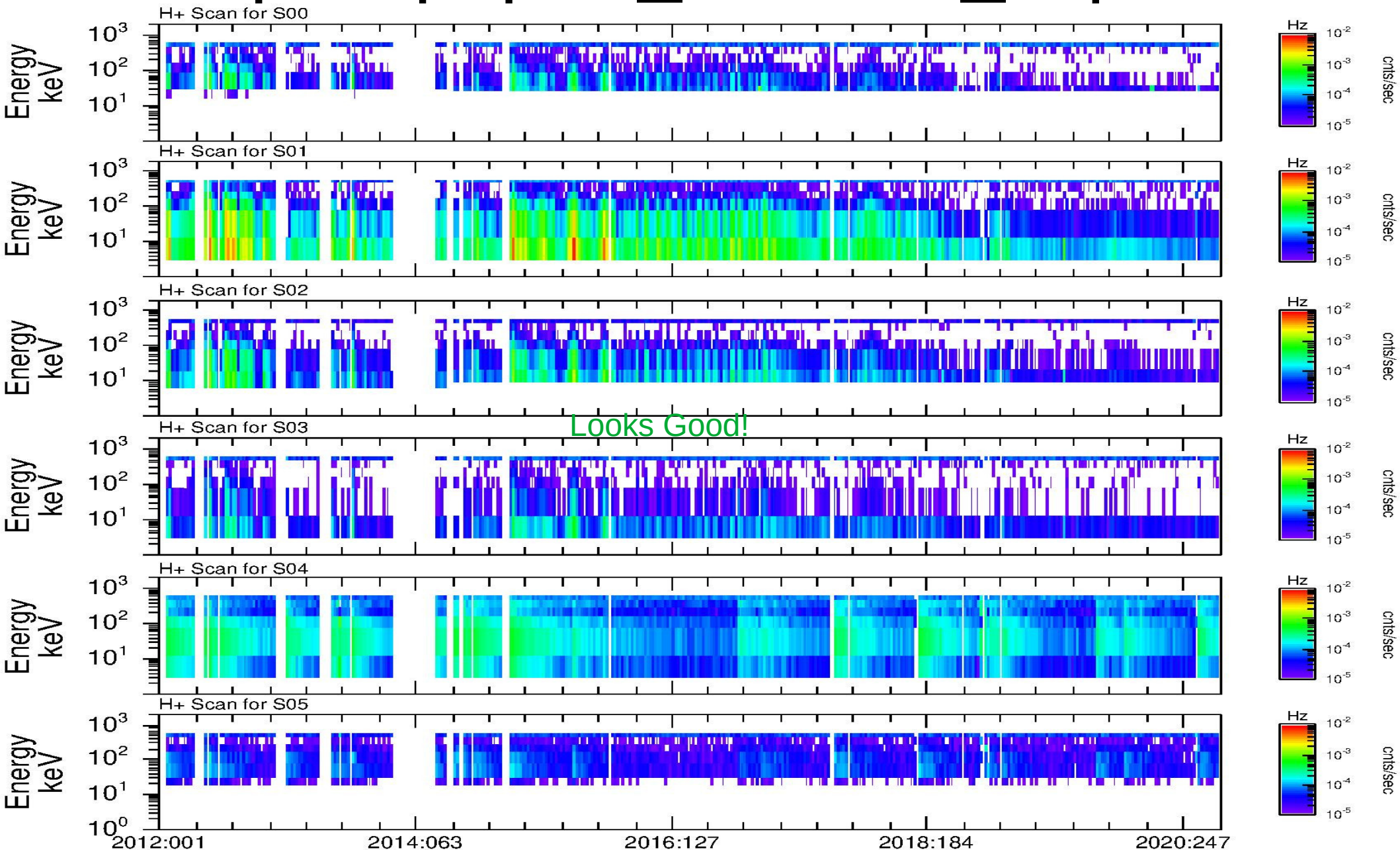


Uncertainty in L7to13

nh-x-pepssi-4-plasma-v1.0/data triples/pepssi_reduced_bcps*

Protons



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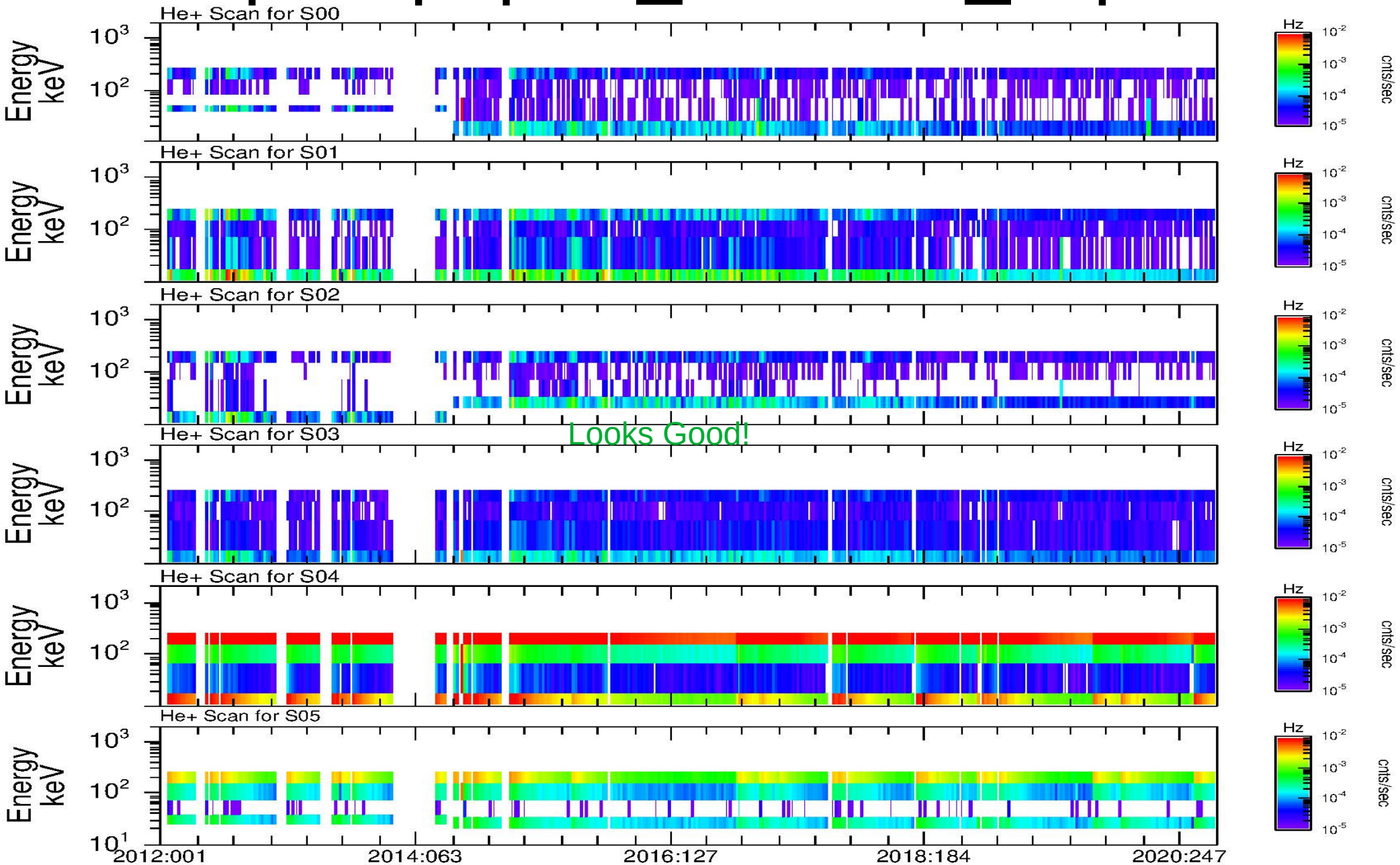
Helium



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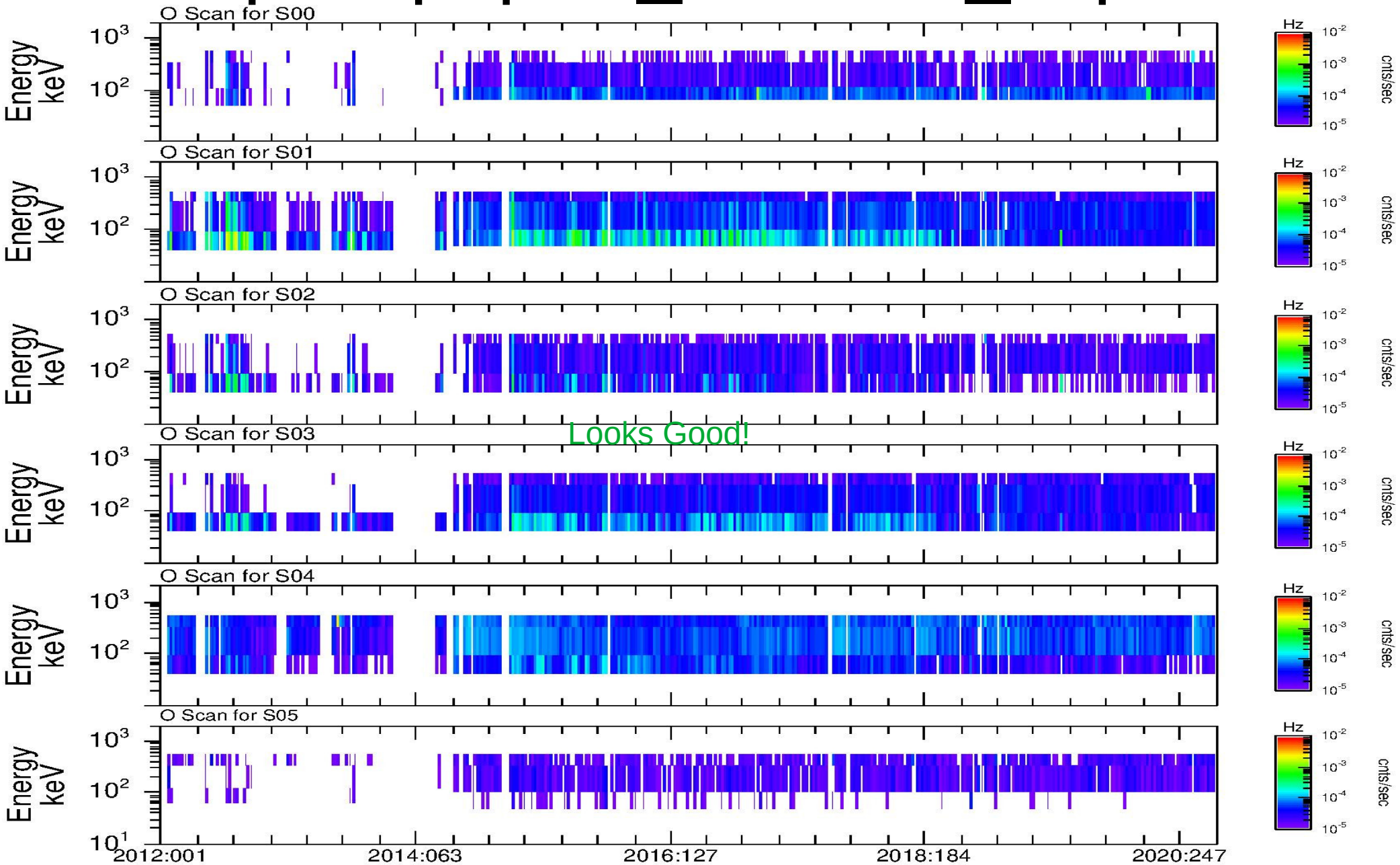
Oxygen



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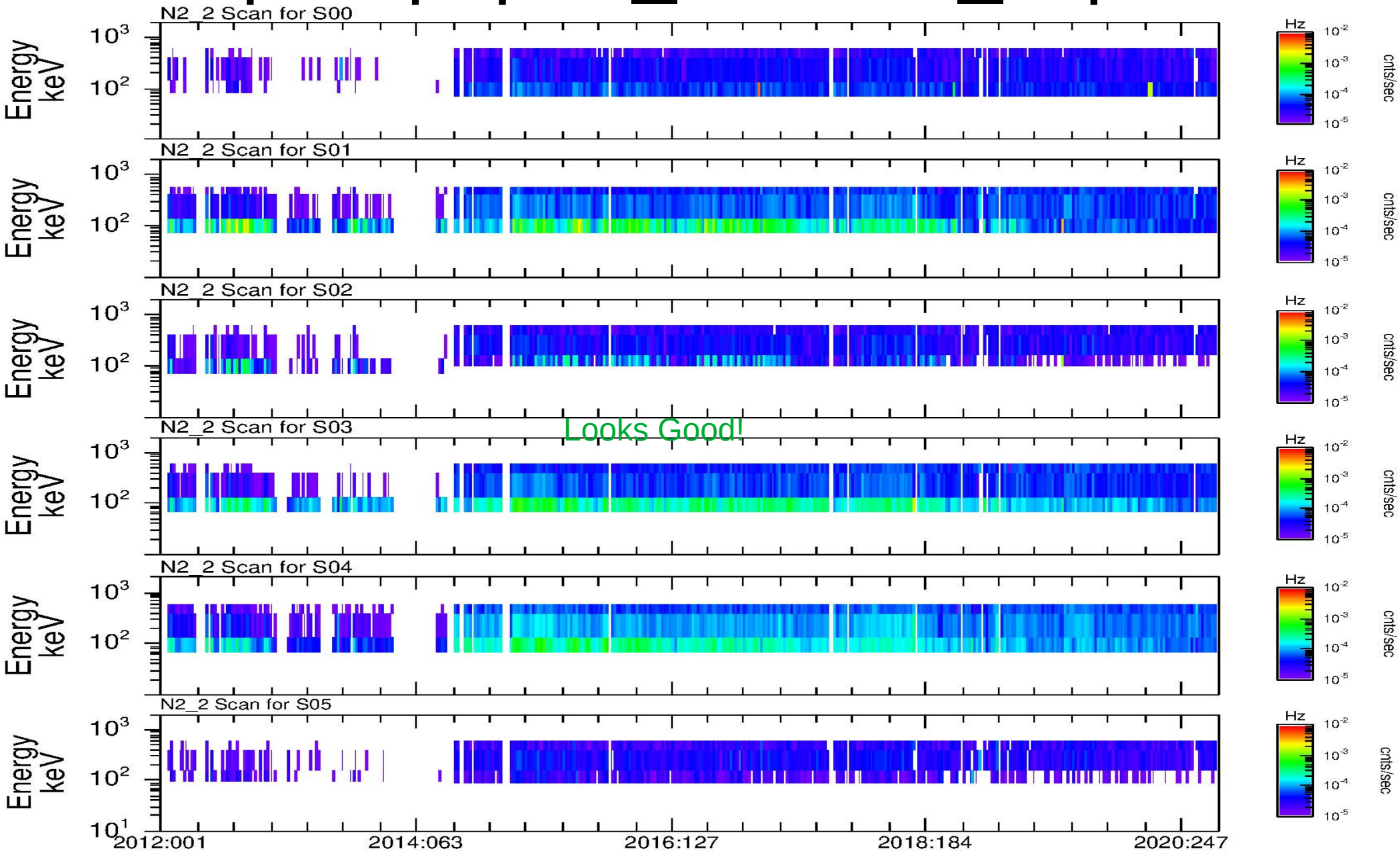
Nitrogen



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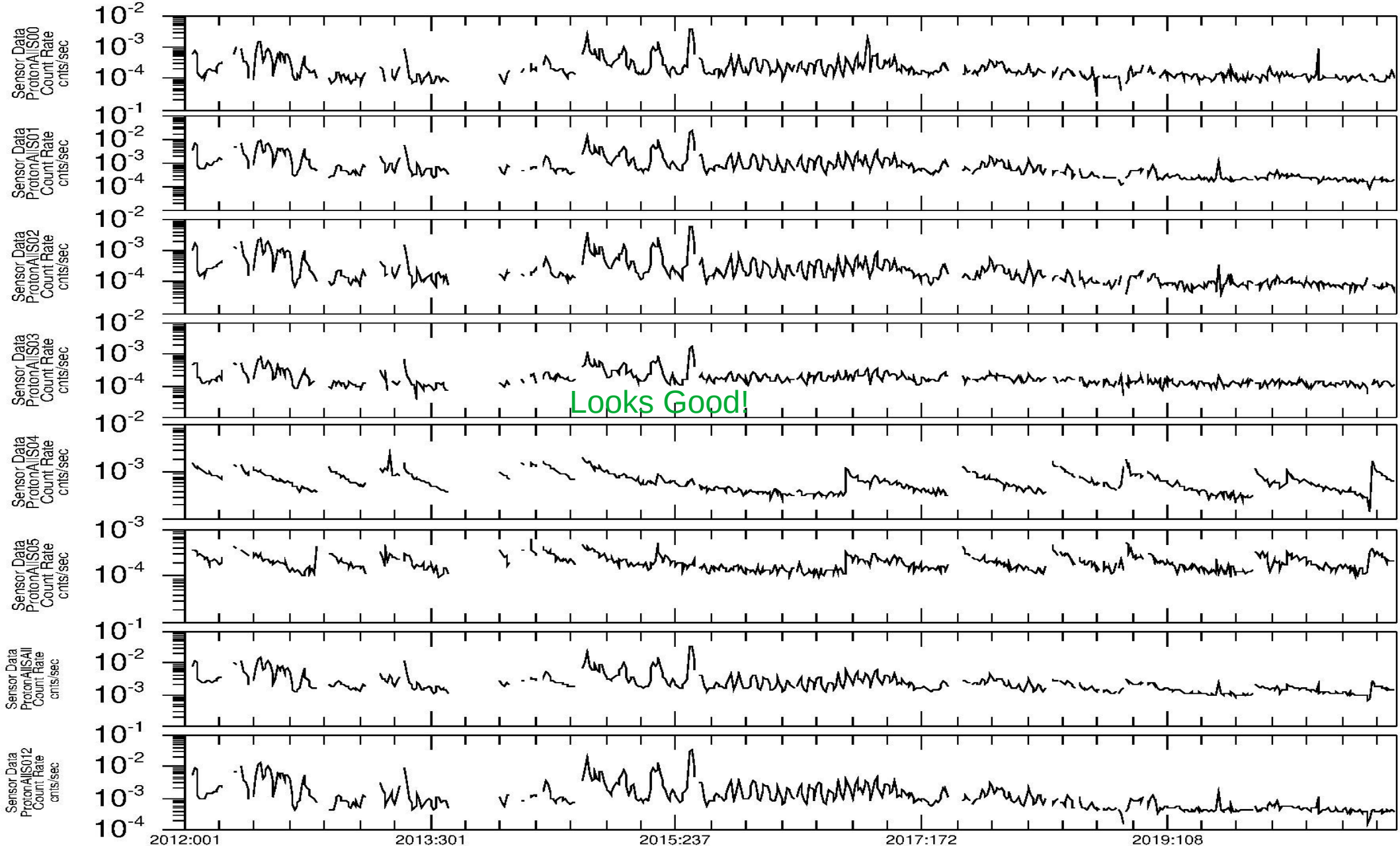
Protons



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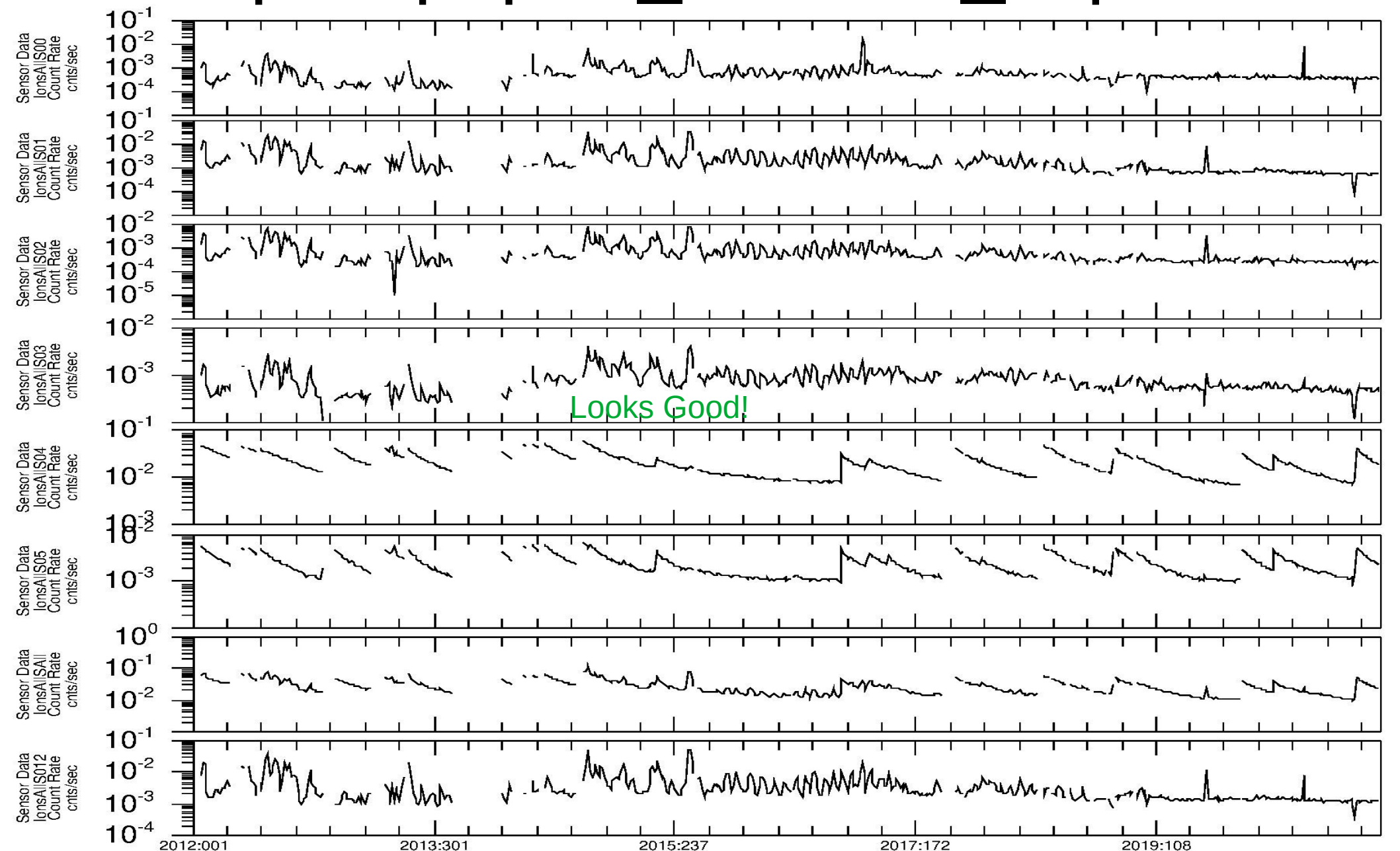
Ions



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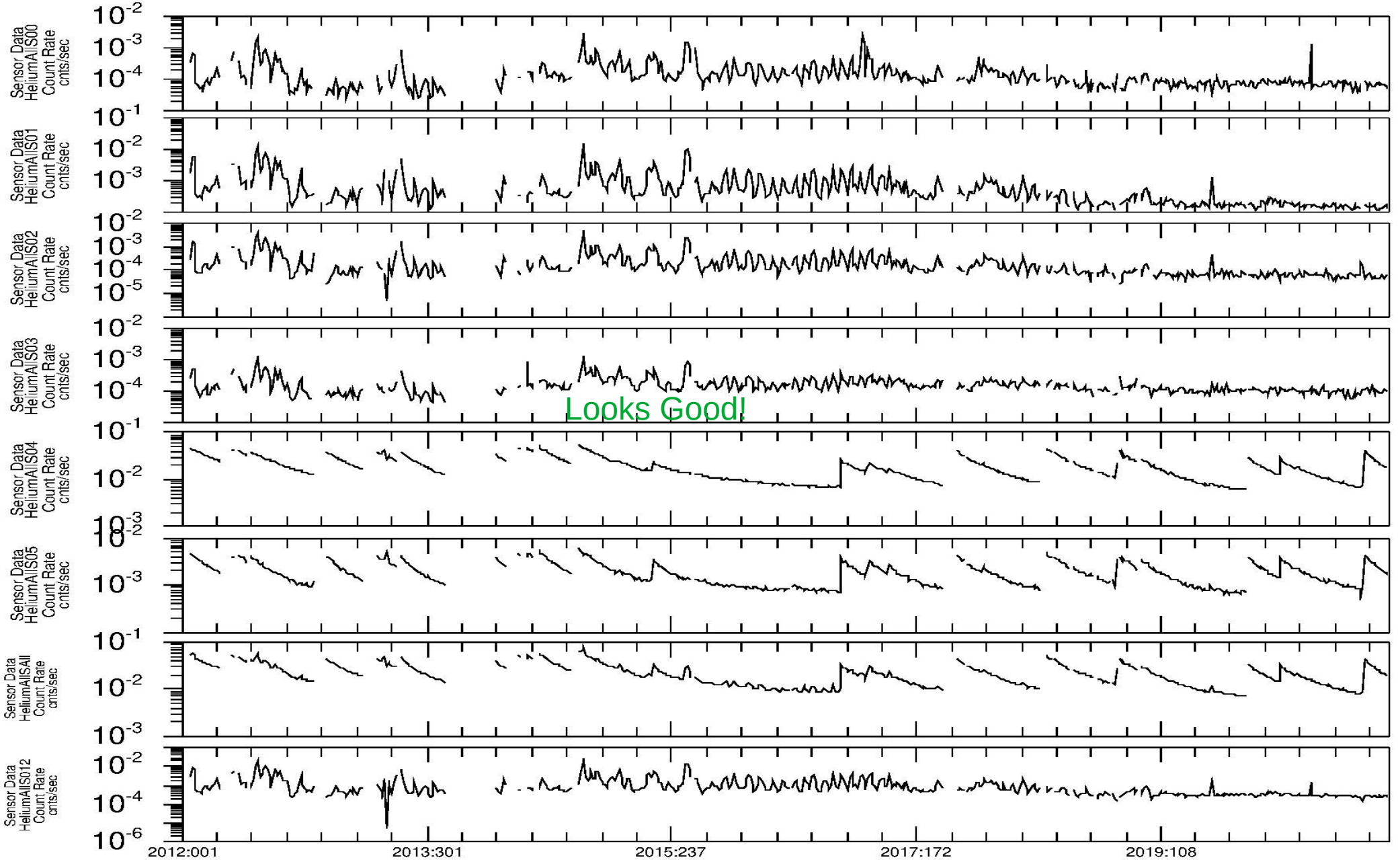
Helium



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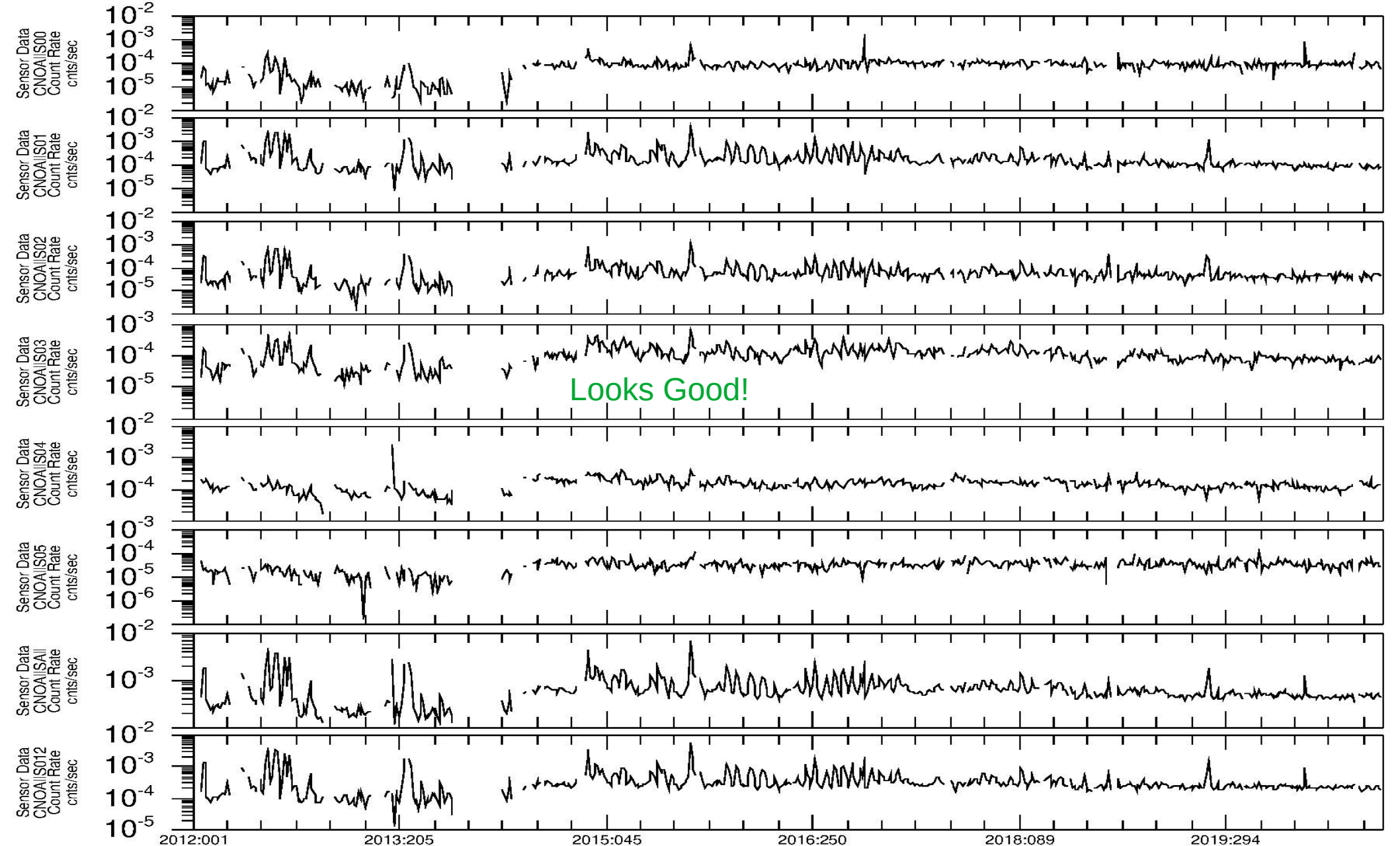
CNO



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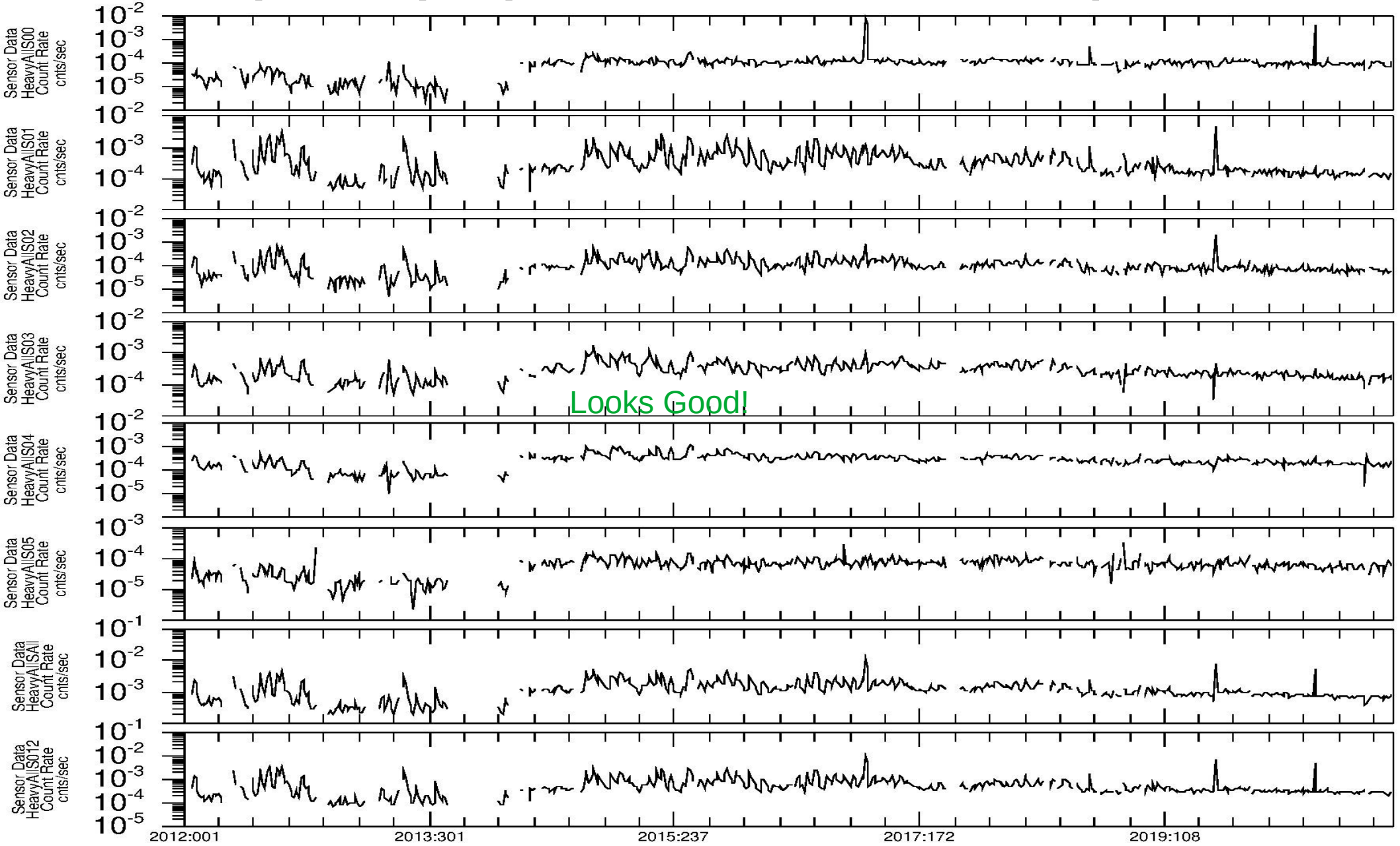
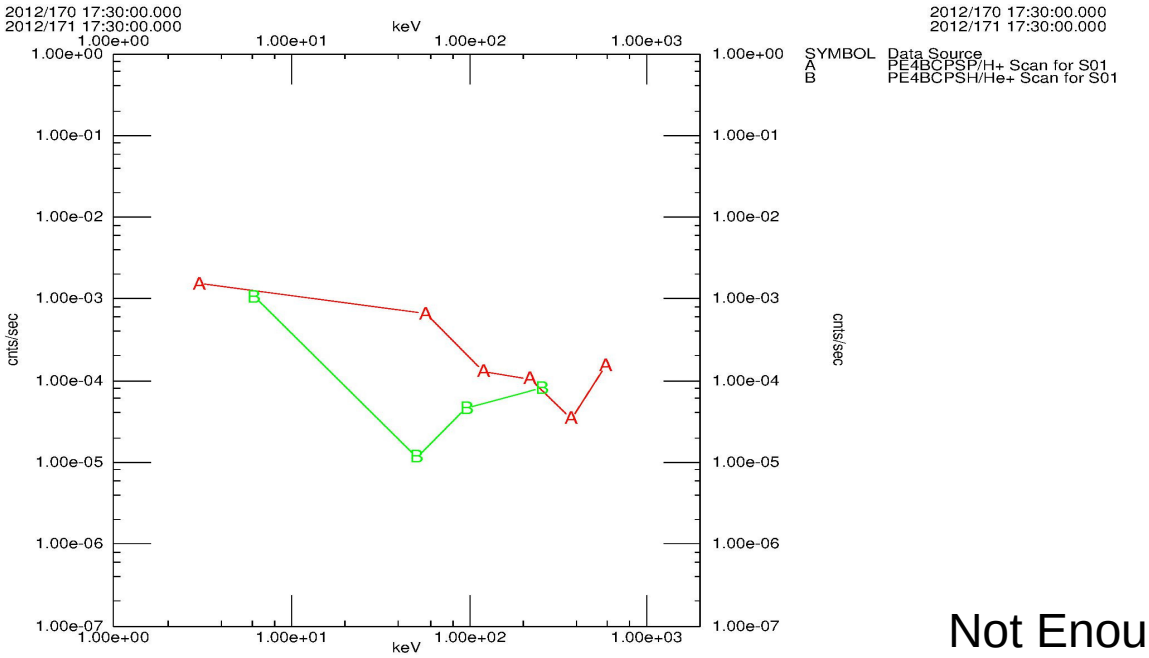
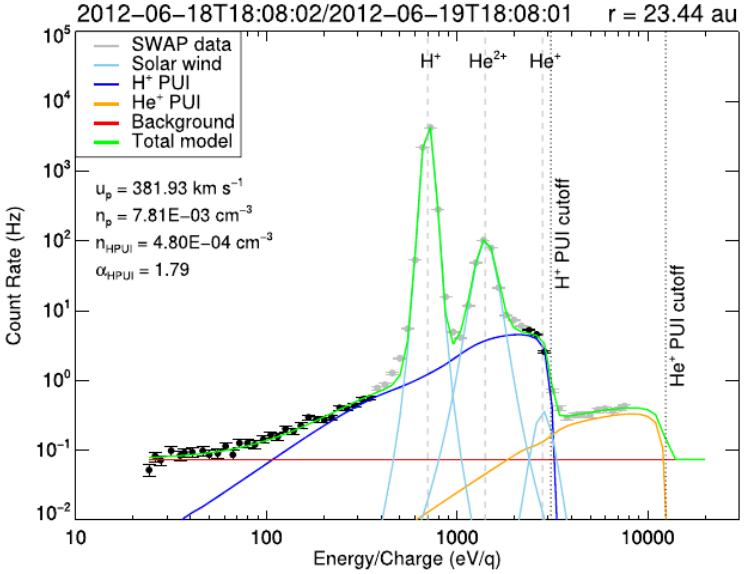
Heavy







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?