# RPW Consortium meeting # 30

# RPW/FIELDS Science Workshop

*Orléans, 26-29 2025*

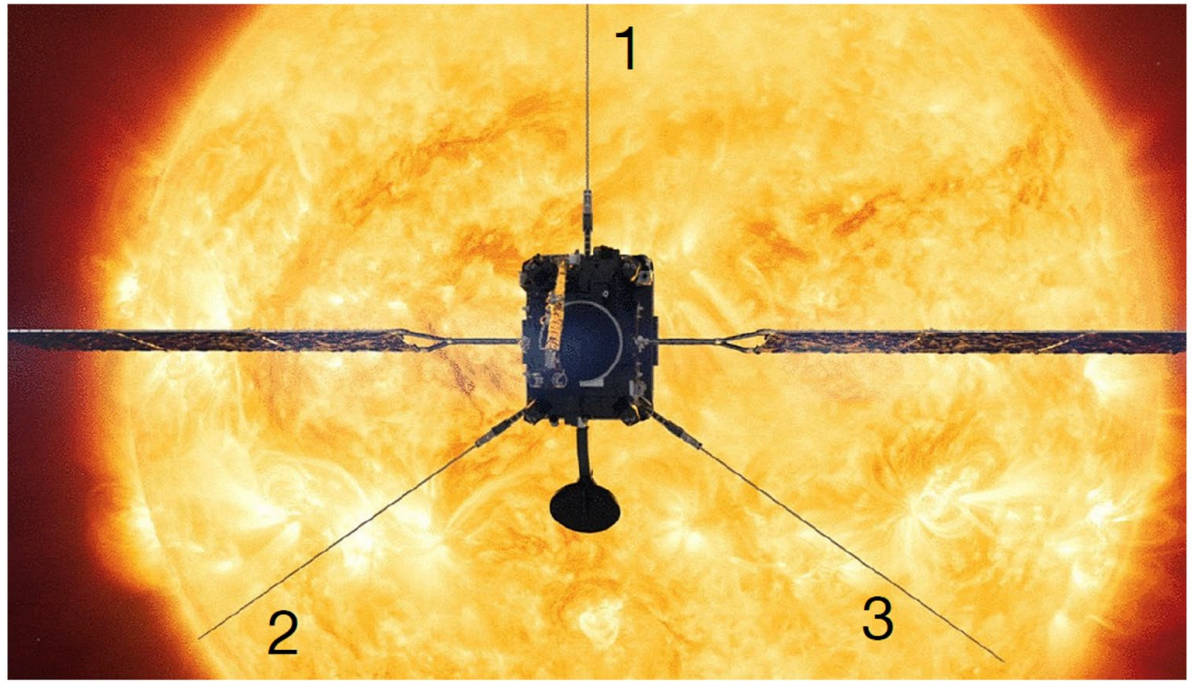
Laboratoire d'Études Spatiales et d'Instrumentation en Astrophysique

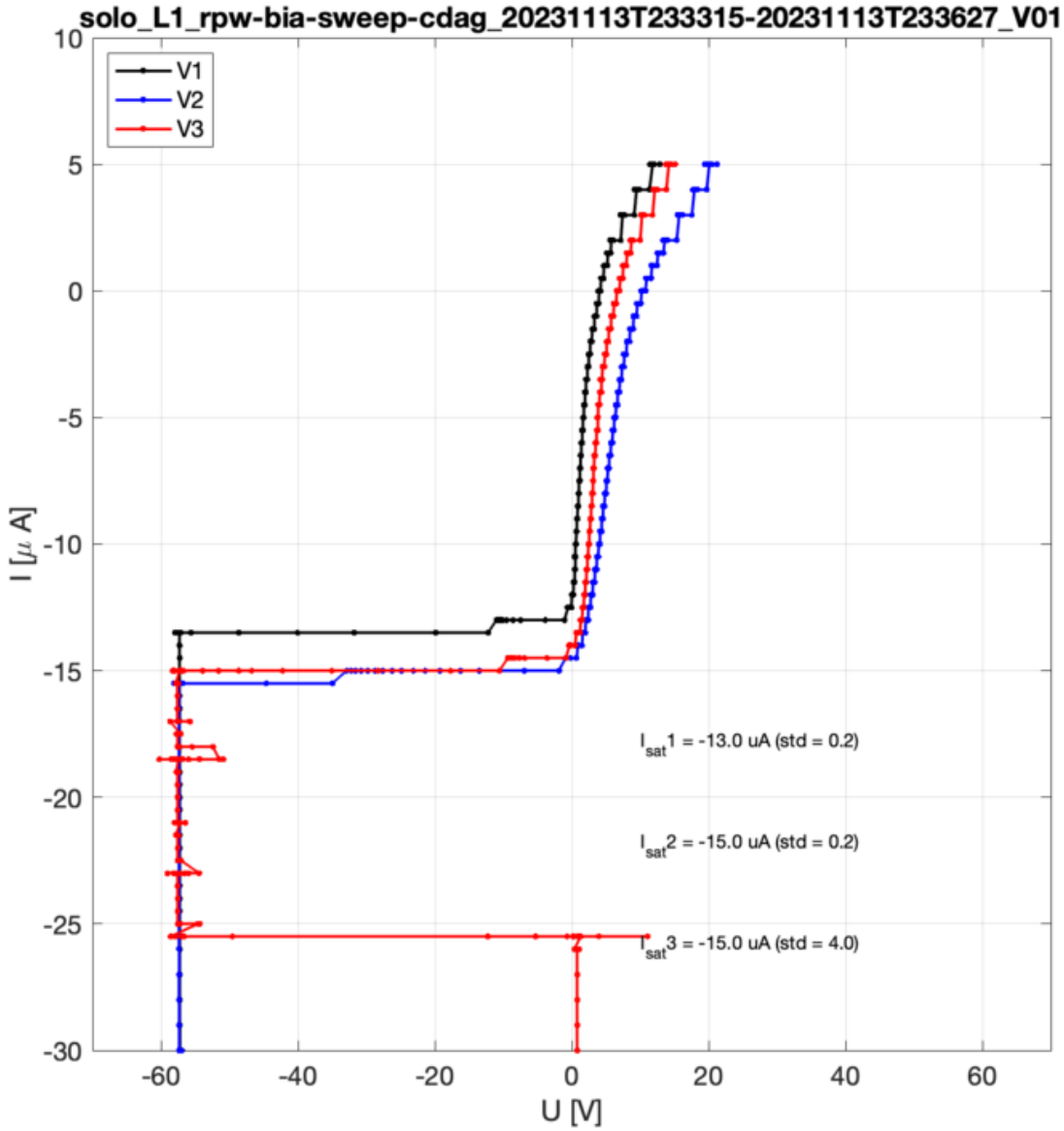


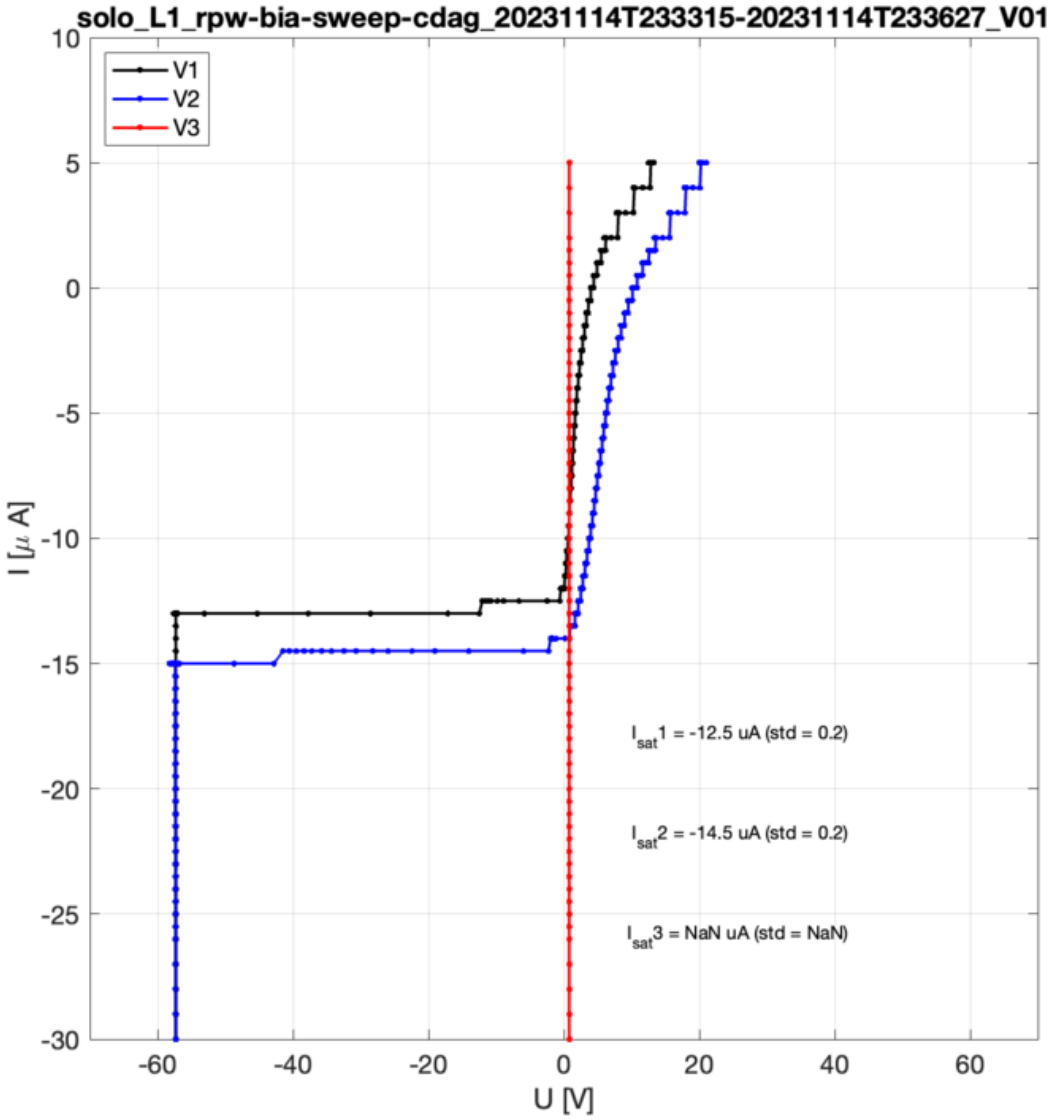
- ROC & operation status
- RPW Antenna Status
- Data access, tools, website
- FIELDS status

# RPW ANT Anomaly

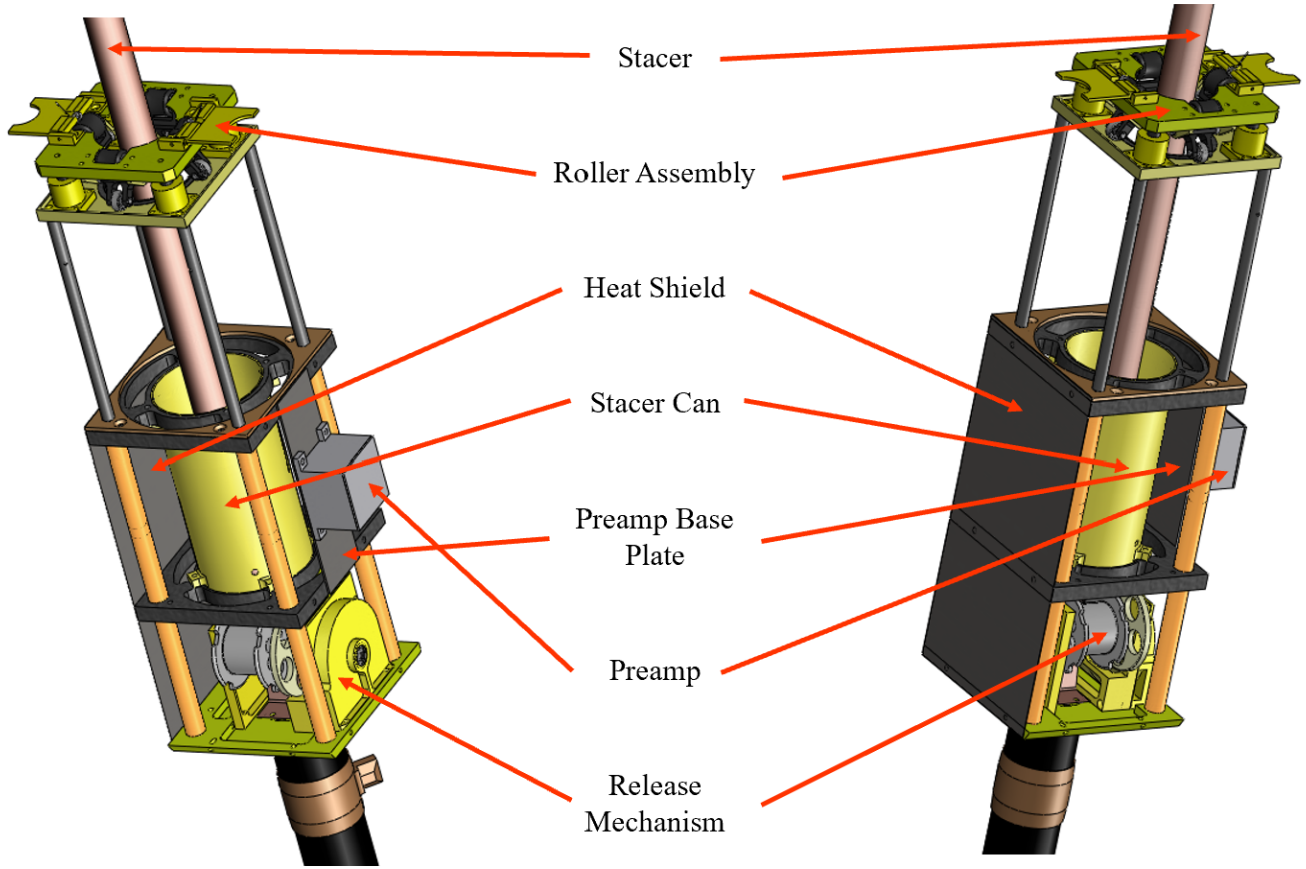
- **Antenna 3 is malfunctionning**
  - ***Internal issue with the pre-amp?***
  - ***Mechanical break ?***
  - ***Under assessment (Anomaly review board is being set)***
  - ***There is an impact on the science***

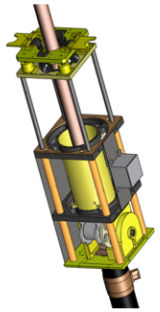



solo_L1_rpw-bia-sweep-cdag_20231113T233315-20231113T233627_V01
V1
V2
V3
I [μ A]
U [V]
I_sat1 = -13.0 uA (std = 0.2)
I_sat2 = -15.0 uA (std = 0.2)
I_sat3 = -15.0 uA (std = 4.0)


solo_L1_rpw-bia-sweep-cdag_20231114T233315-20231114T233627_V01
V1
V2
V3
I [μ A]
U [V]
I_sat1 = -12.5 uA (std = 0.2)
I_sat2 = -14.5 uA (std = 0.2)
I_sat3 = NaN uA (std = NaN)

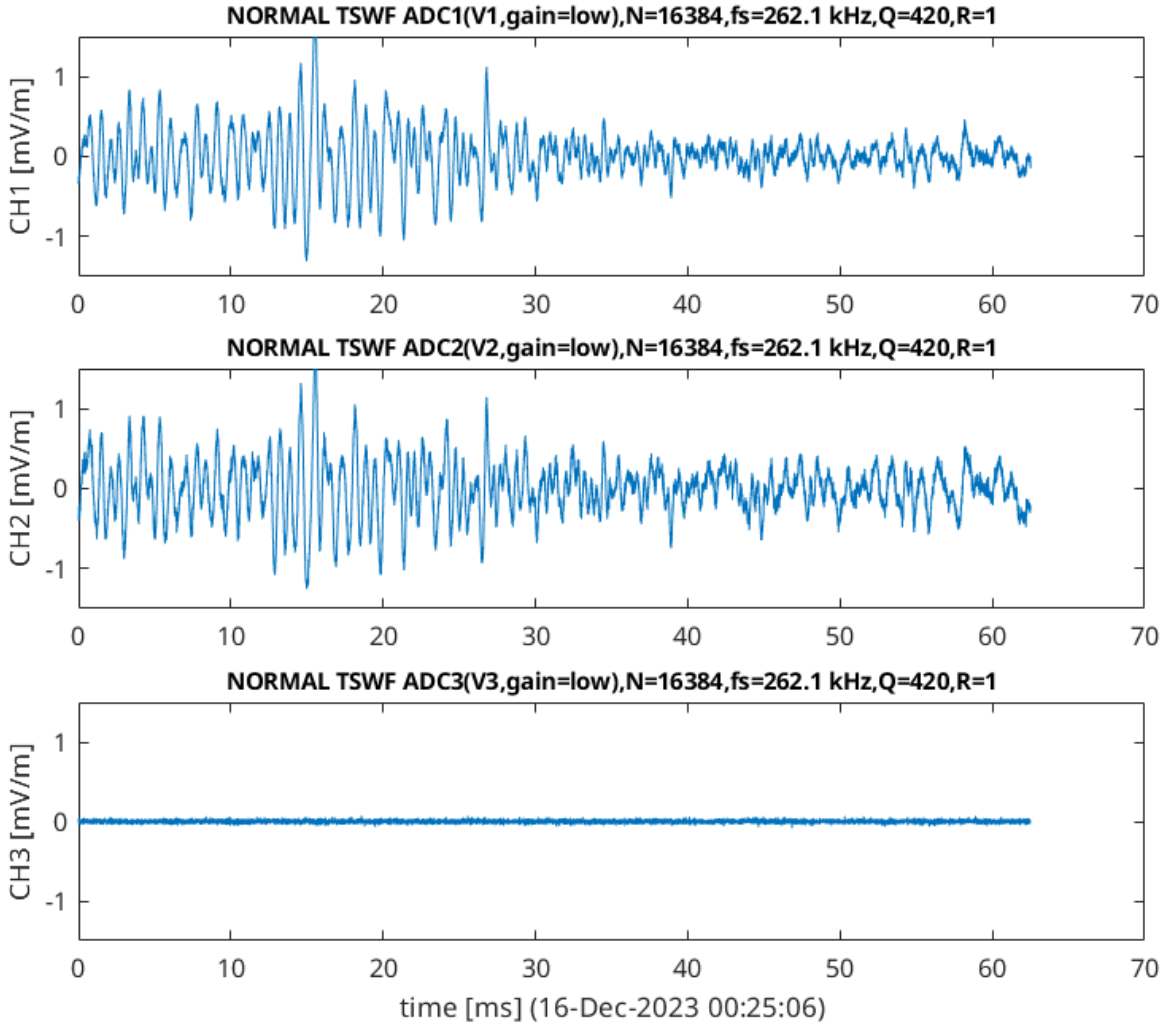
# Preamp and Deployment Mechanism



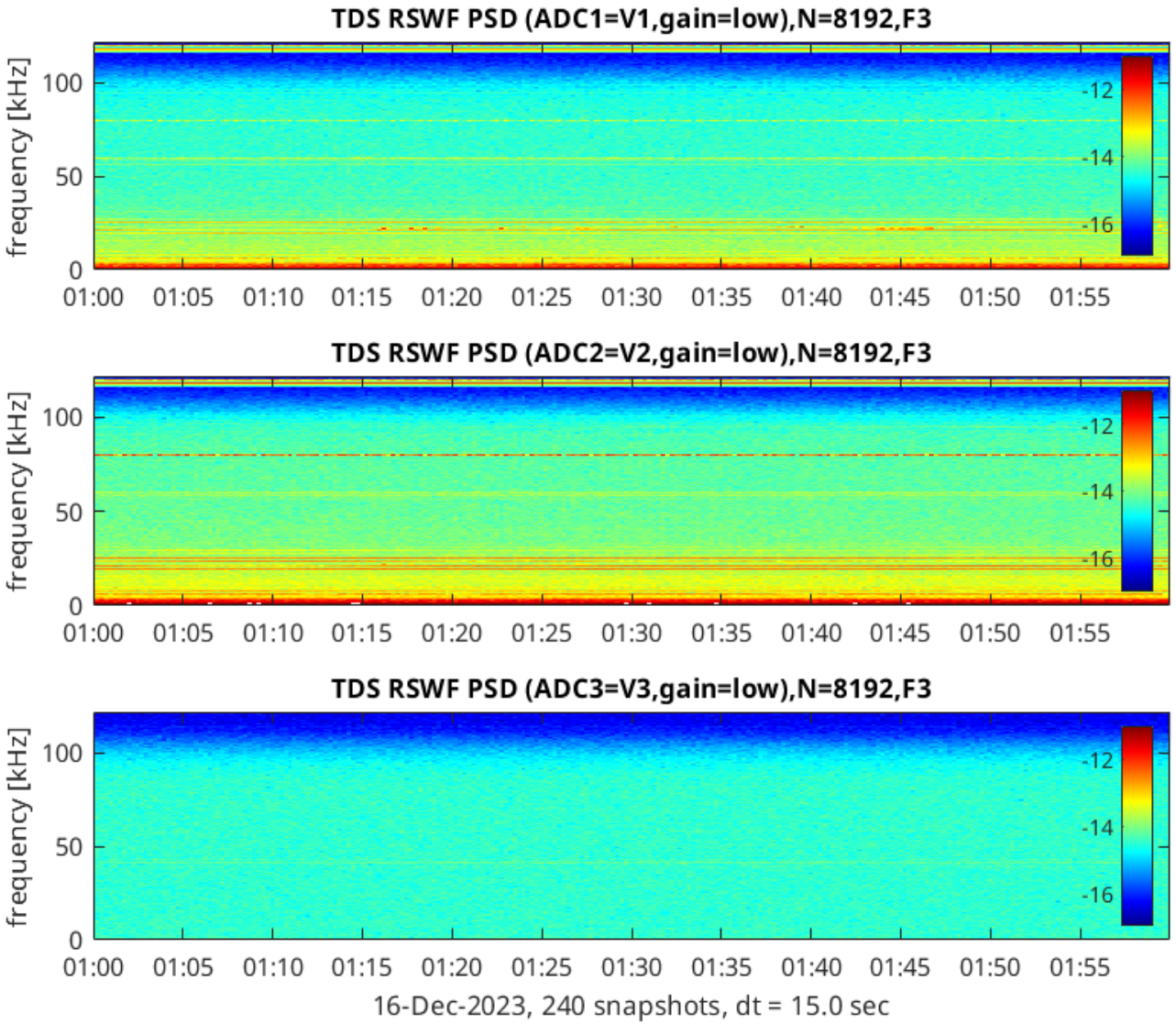
Current SolidWorks Model

# TDS data after the anomaly



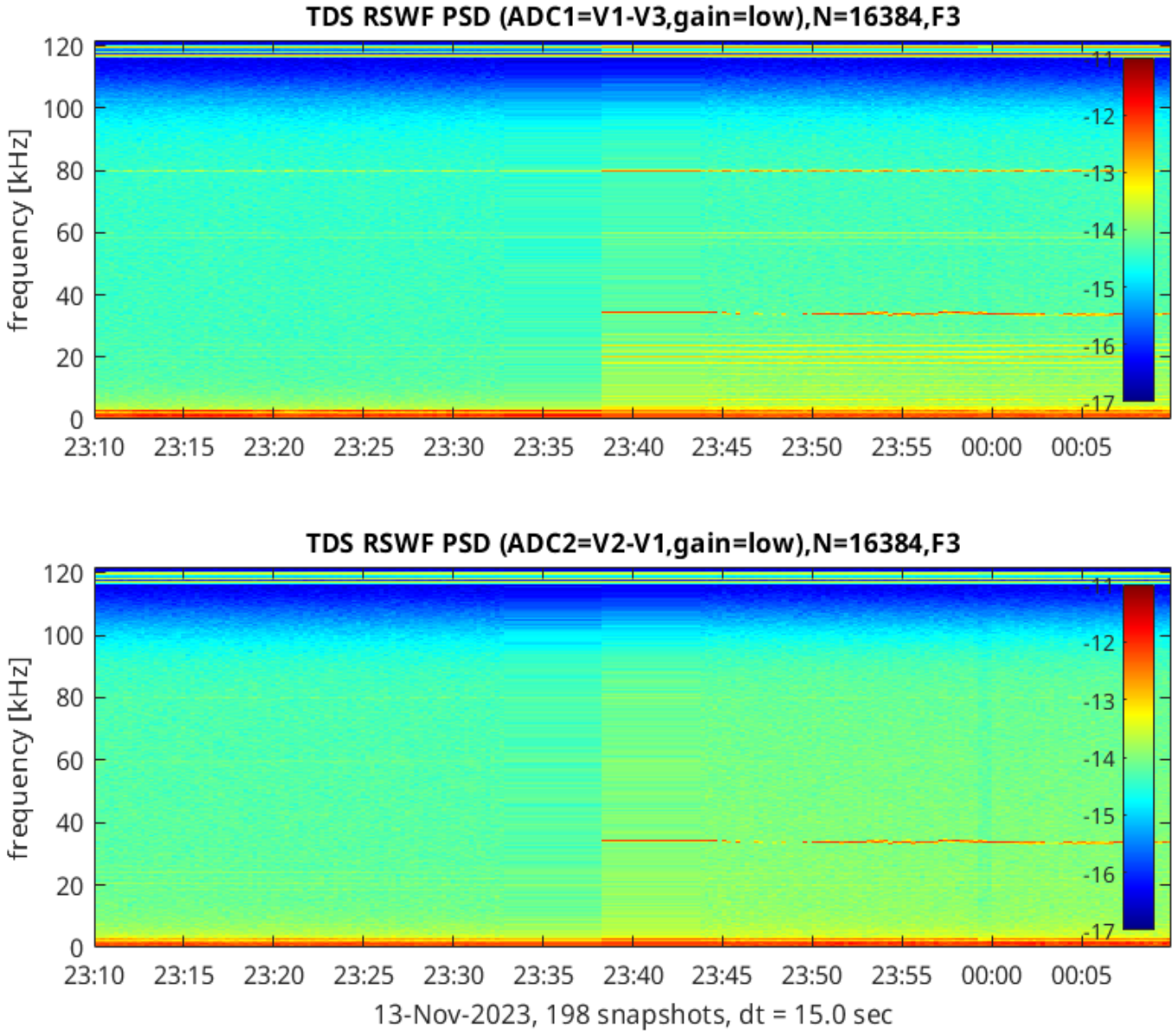

- On December 16, TDS was configured to a monopole mode, where each channel samples a single antenna.
- Clearly, Antenna 3 sees no signal at all
- TDS uses a high frequency preamplifier (different from the one used by the RPW bias), but sharing the same antenna connection “pigtail”

# TDS data after the anomaly (spectrum)



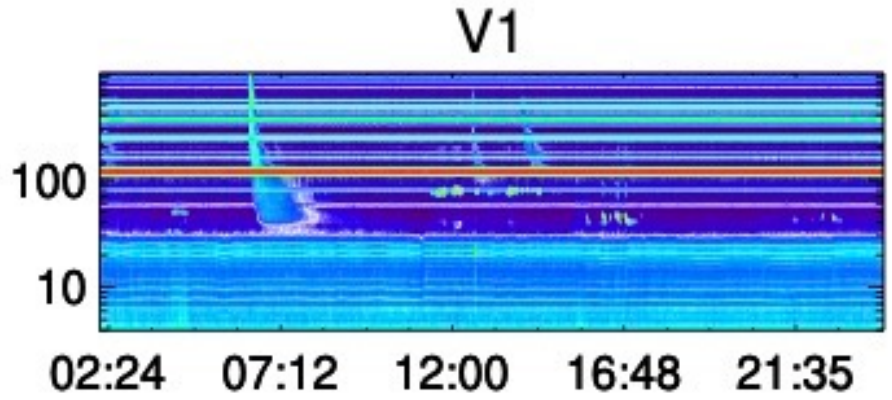

- Channel3 only sees (analog) noise, comparable to a situation when the preamplifier would be grounded at its input.
- Even the 120 kHz interference from the PCDU is gone.

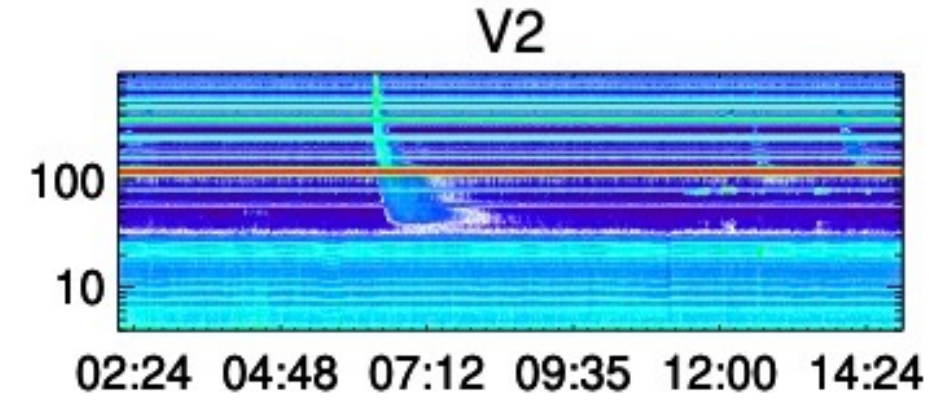
# TDS data during anomaly on Nov 13

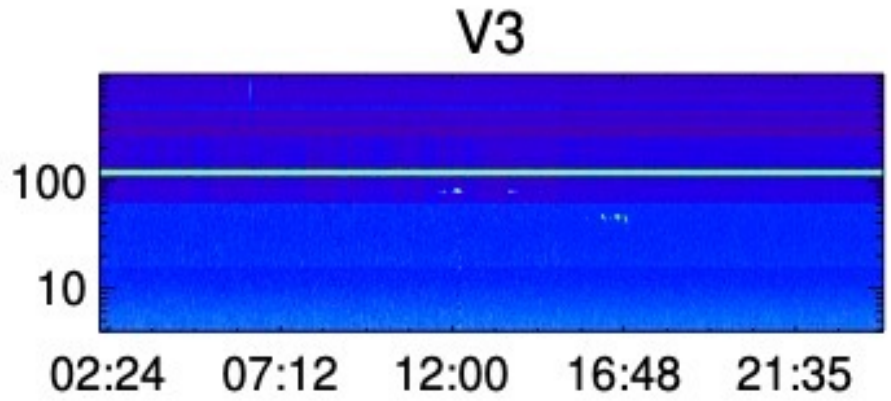


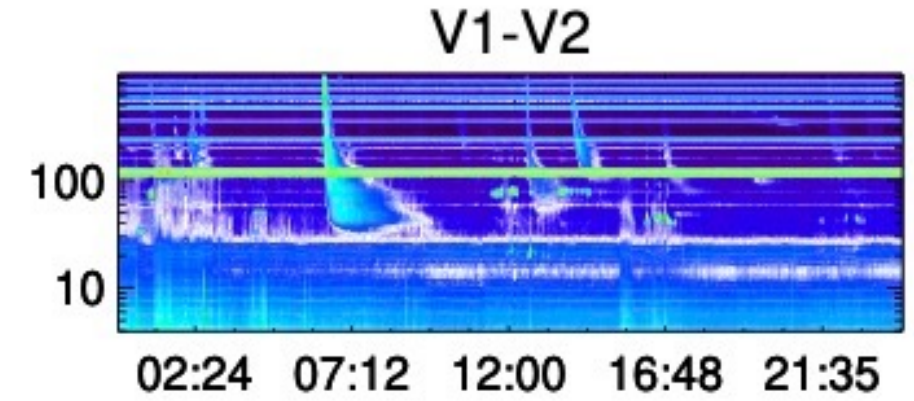

- V3 anomaly occurred on Nov 13, 23:38.
- TDS was in a dipole configuration
- Channel 1 (V1-V3) observes an increase in background interferences due to changing from a dipole to effective monopole
- Increase of the 40 kHz interference observed on both channels, this is common after a BIAS current change.
- A slight increase of background noise on V2-V1 channel observed too. Origin unknown, may or may be related to the anomaly or a bias current change.

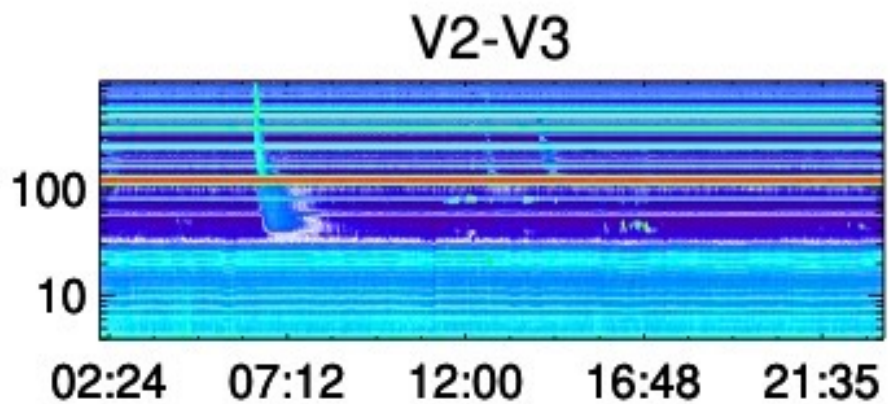
*22/01/2024*

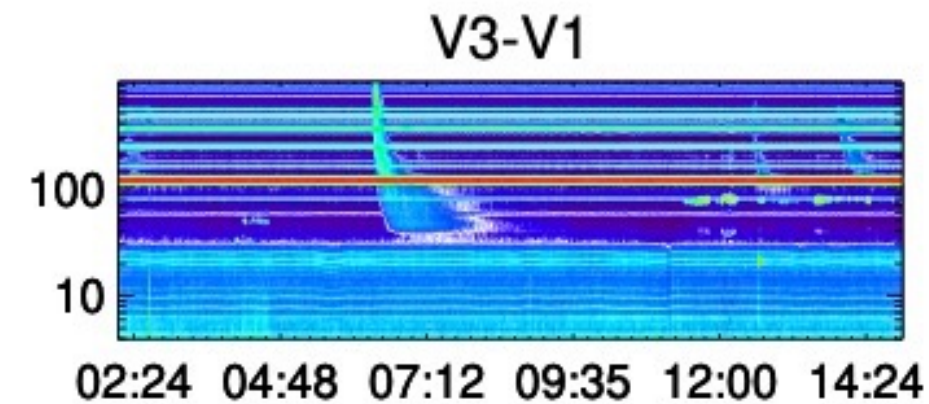

V1
100
10
02:24
07:12
12:00
16:48
21:35


V2
100
10
02:24
04:48
07:12
09:35
12:00
14:24

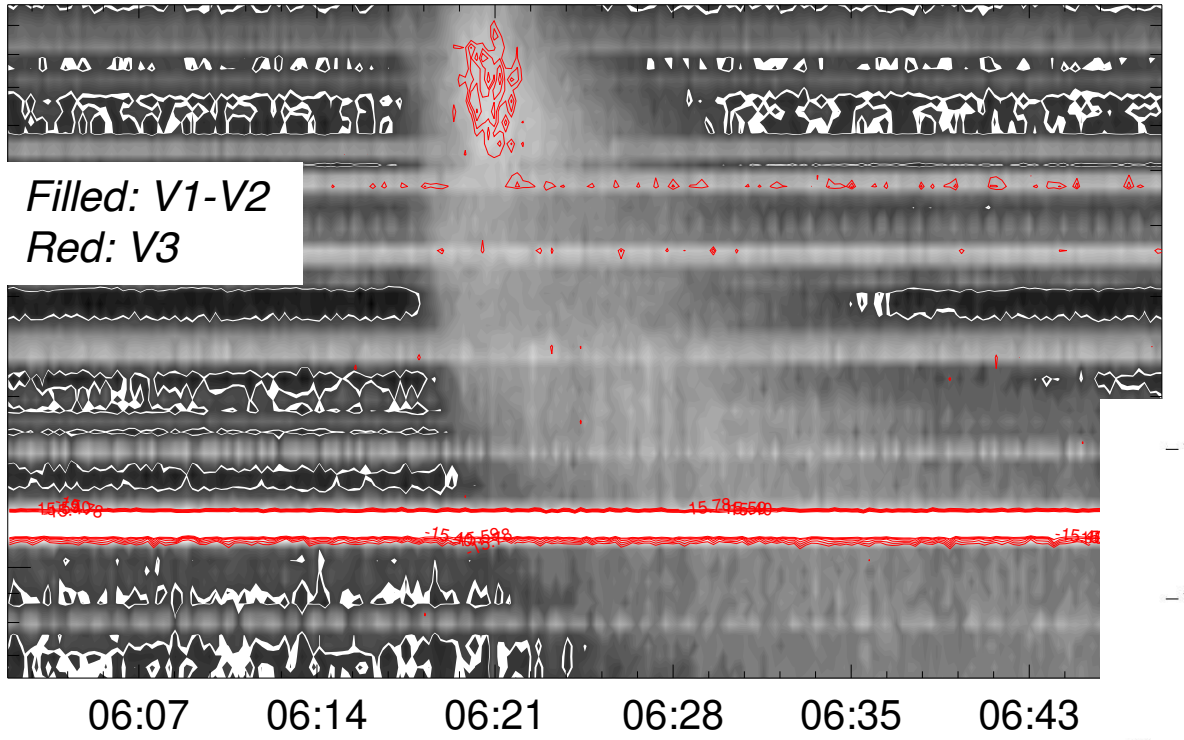

V3
100
10
02:24
07:12
12:00
16:48
21:35

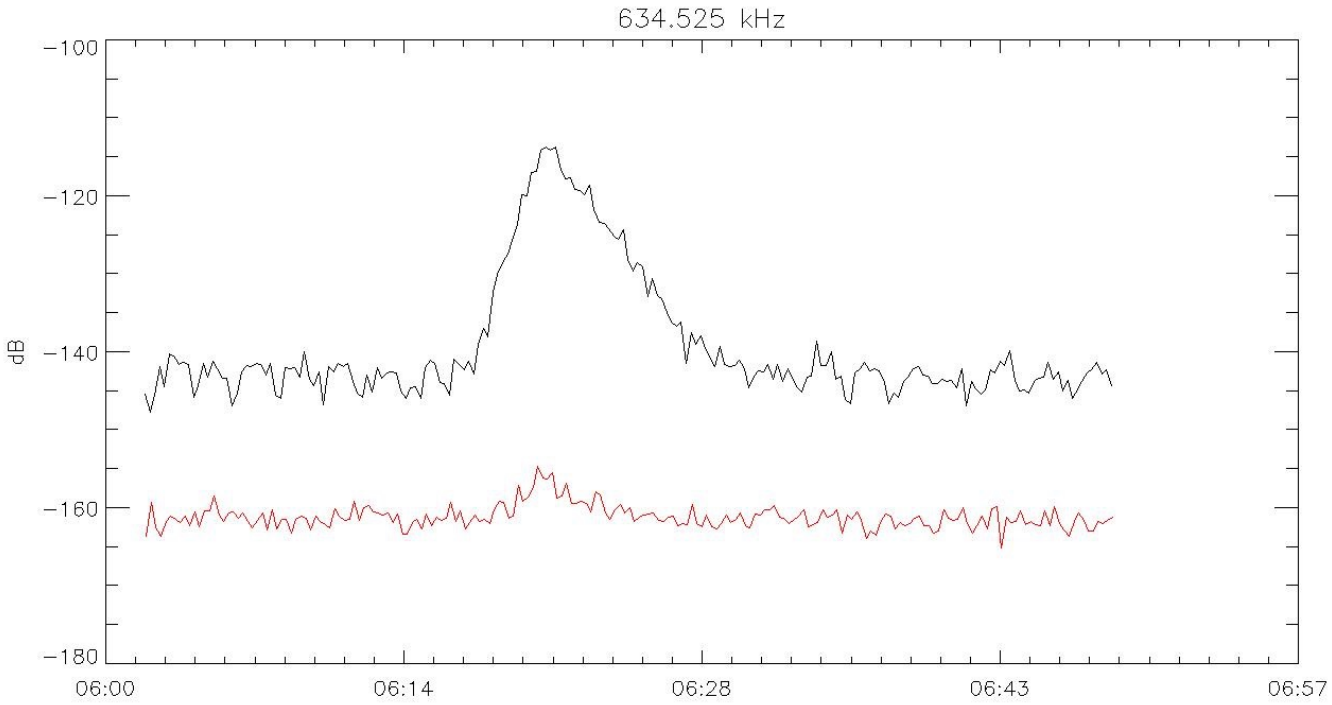

V1-V2
100
10
02:24
07:12
12:00
16:48
21:35


V2-V3
100
10
02:24
07:12
12:00
16:48
21:35

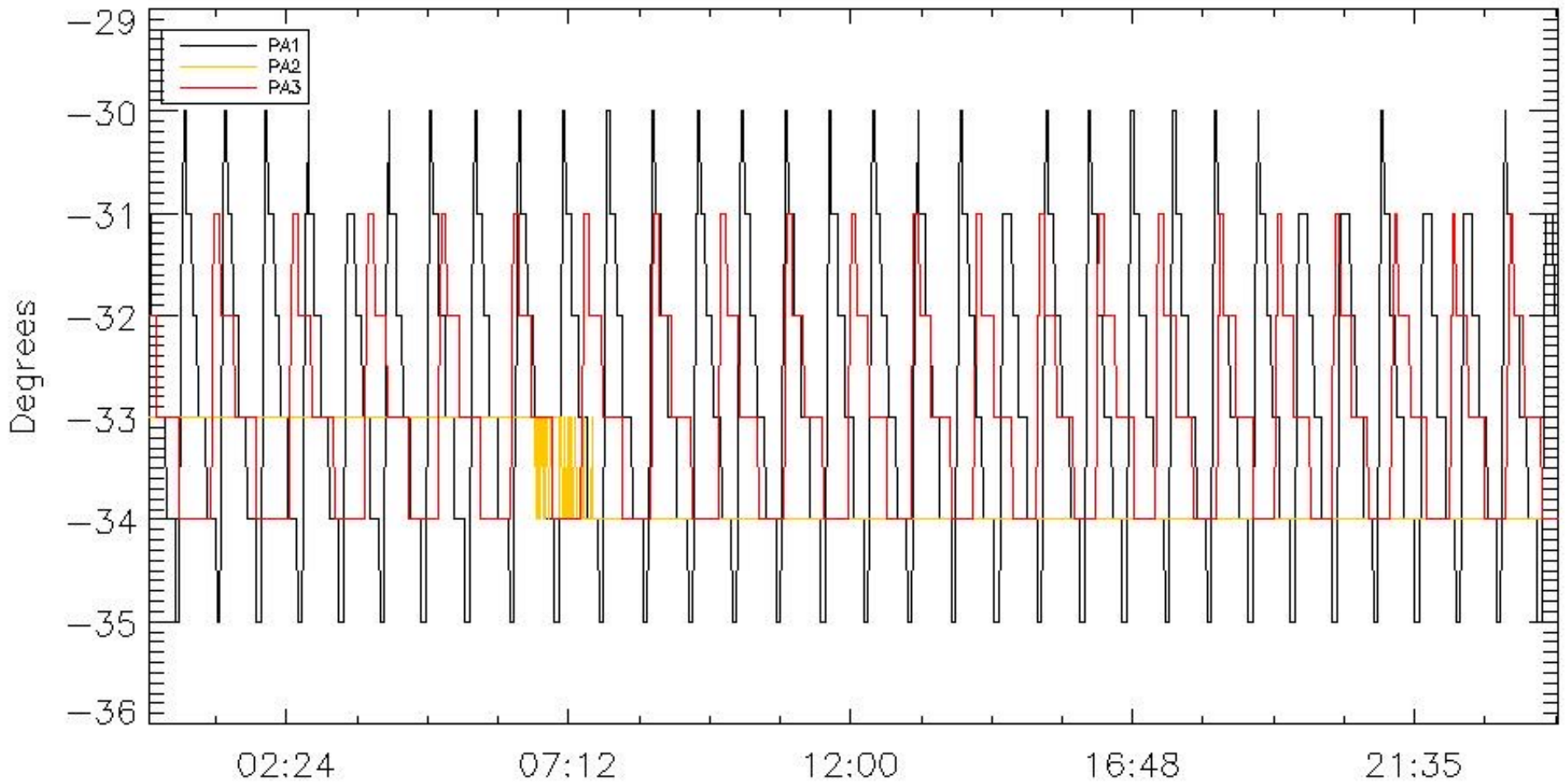

V3-V1
100
10
02:24
04:48
07:12
09:35
12:00
14:24

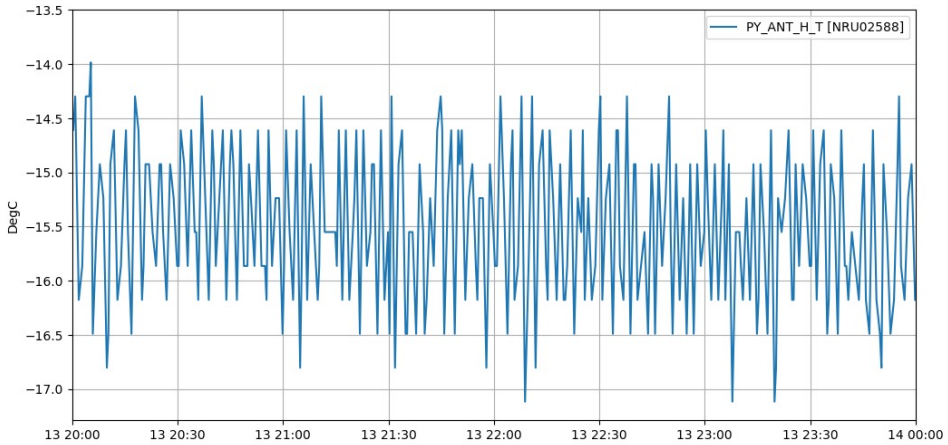
# 22/01/2024

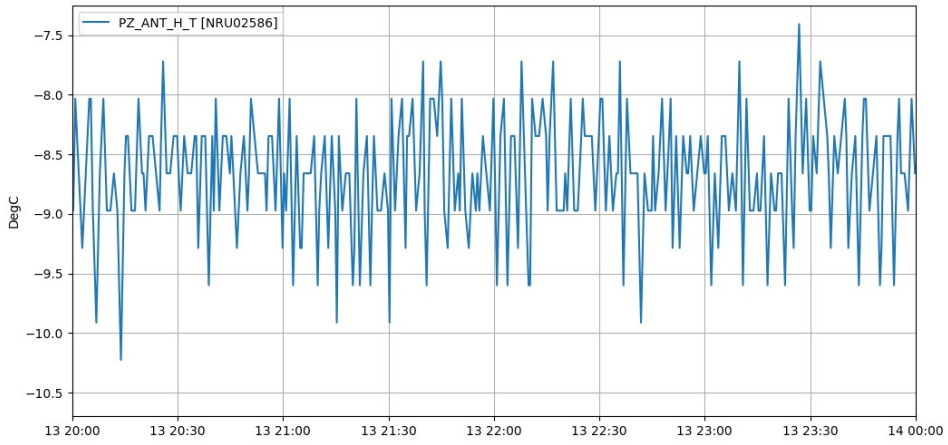

Filled: V1-V2
Red: V3
00
06:07
06:14
06:21
06:28
06:35
06:43

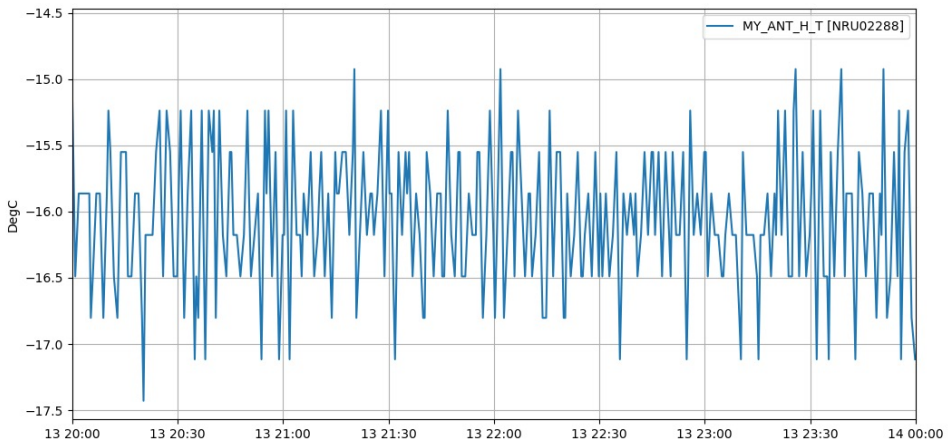

634.525 kHz
dB
−100
−120
−140
−160
−180
06:00
06:14
06:28
06:43
06:57

# *Temperature for ANT PA*






# *Temperature of Hinges*

# Data loss and possible mitigations on TDS

- On TDS we usually run in a dipole config, sampling
  - CH1 = V3-V1
  - CH2 = V1-V2
  - CH3 = V2

This configuration is not suitable anymore, because the V3-V1 dipole is degraded

- Short term configuration (since January 22)
  - A full monopole config CH1 = V1, CH2 = V2, CH3 = V3
- Short term configuration (since January 22)
  - CH1 = V1
  - CH2 = V1-V2
  - CH3 = V2
- After this configuration change, the data degradation on TDS will not be too bad
  - We will still be able to recover two components of E-field
  - Triggering of the automatic detection can be done on the V1-V2 dipole as until now, which provides the cleanest spectrum.
  - Slightly increased noise on the V1 and V2 monopoles, compared to dipole measurements
  - On the other hand, this configuration is (somehow) better for dust detection.

# Science impact BIAS

- Spacecraft potential and plasma density are OK – using V1 only.
- 2D DC/LF electric field is no longer measured. L3 E-FILED data product likely to be discontinued.
- One component of DC/LF electric field is available.

# Science impact LFR

- Spectral products combining 2D DC/LF electric field components are no longer possible (radial component of the Poynting flux, phase velocity)
- Power spectrum of 1 DC/LF electric field component can still be measured.