THR STATUS

RPW Consortium & Science Meeting #1 04/09/2020

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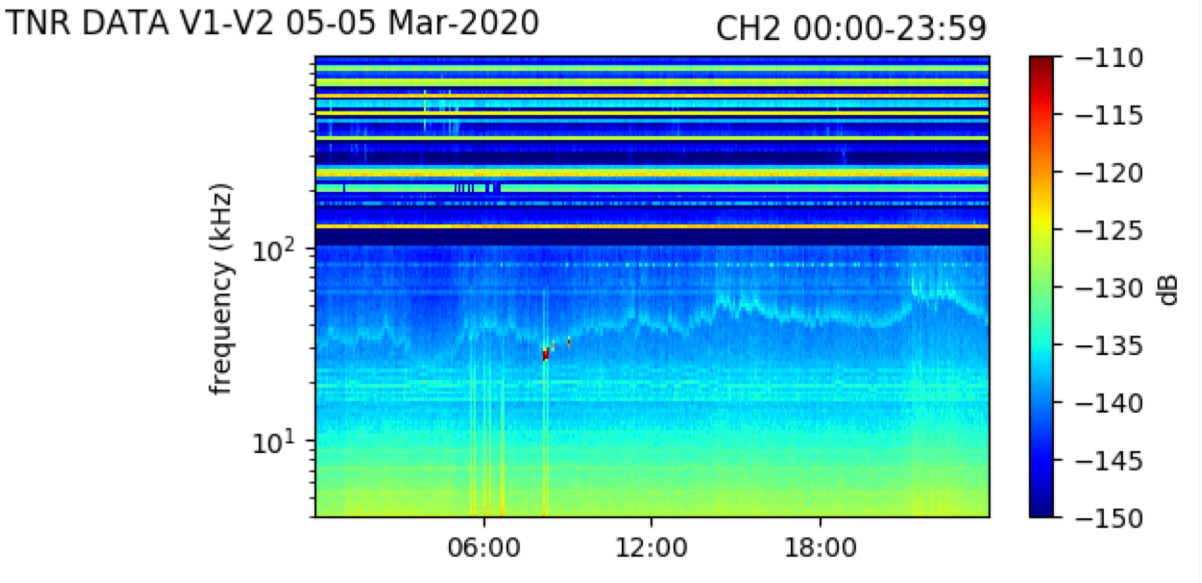
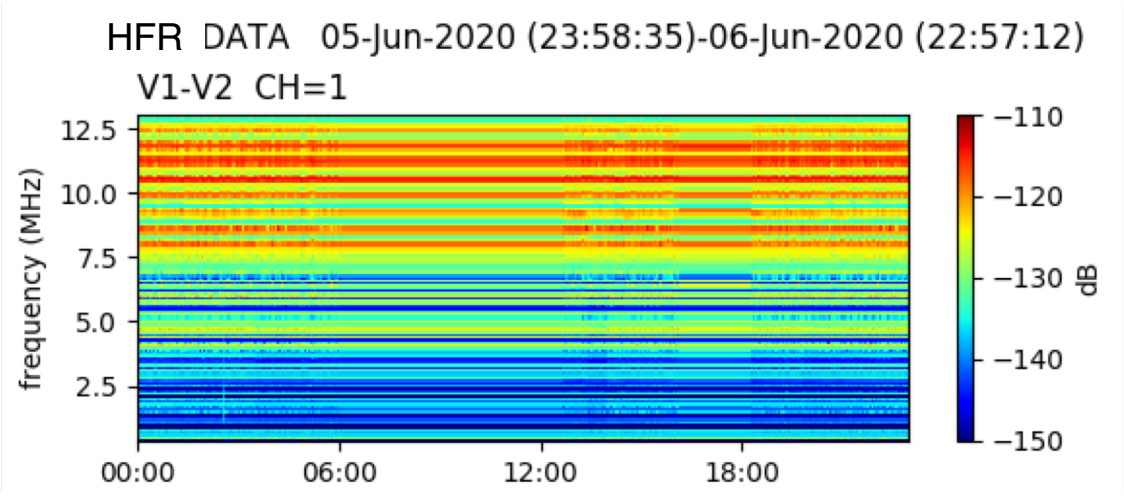
- Both TNR and HFR are both operating well
- NO significant ISSUES to be reported





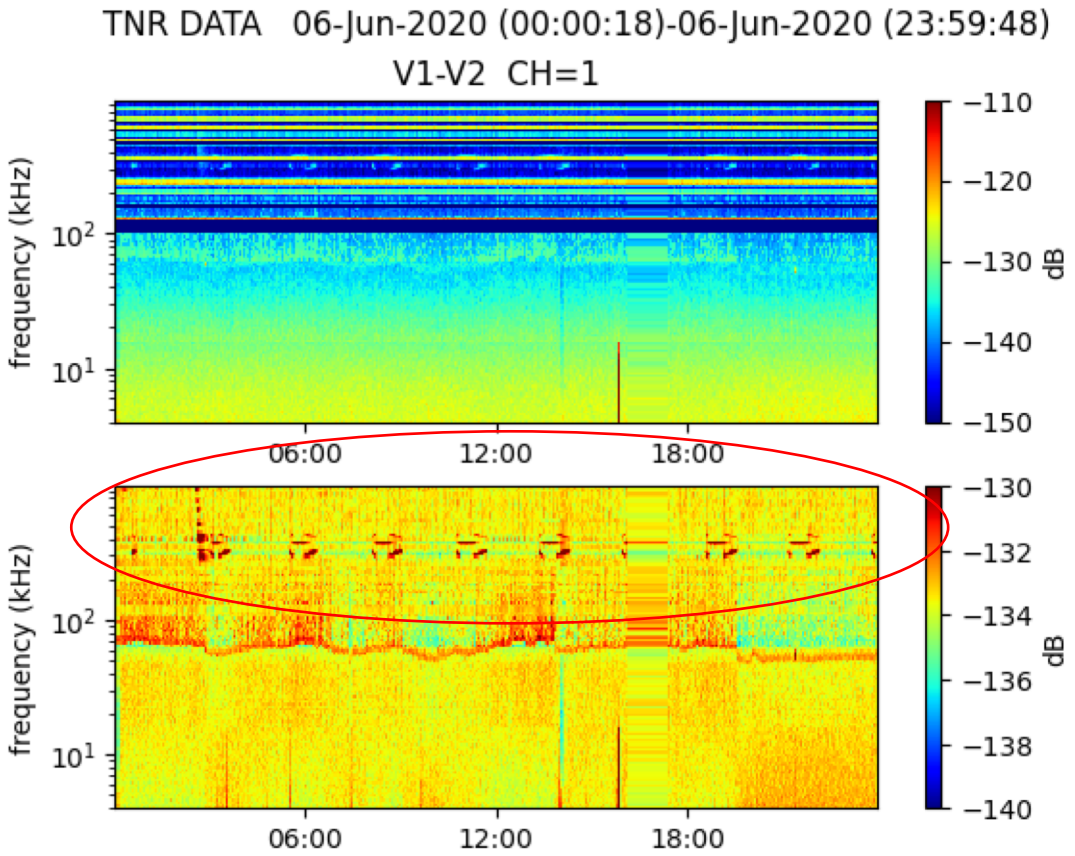
- THR team ready to release TNR-HFR with quality_flag 1

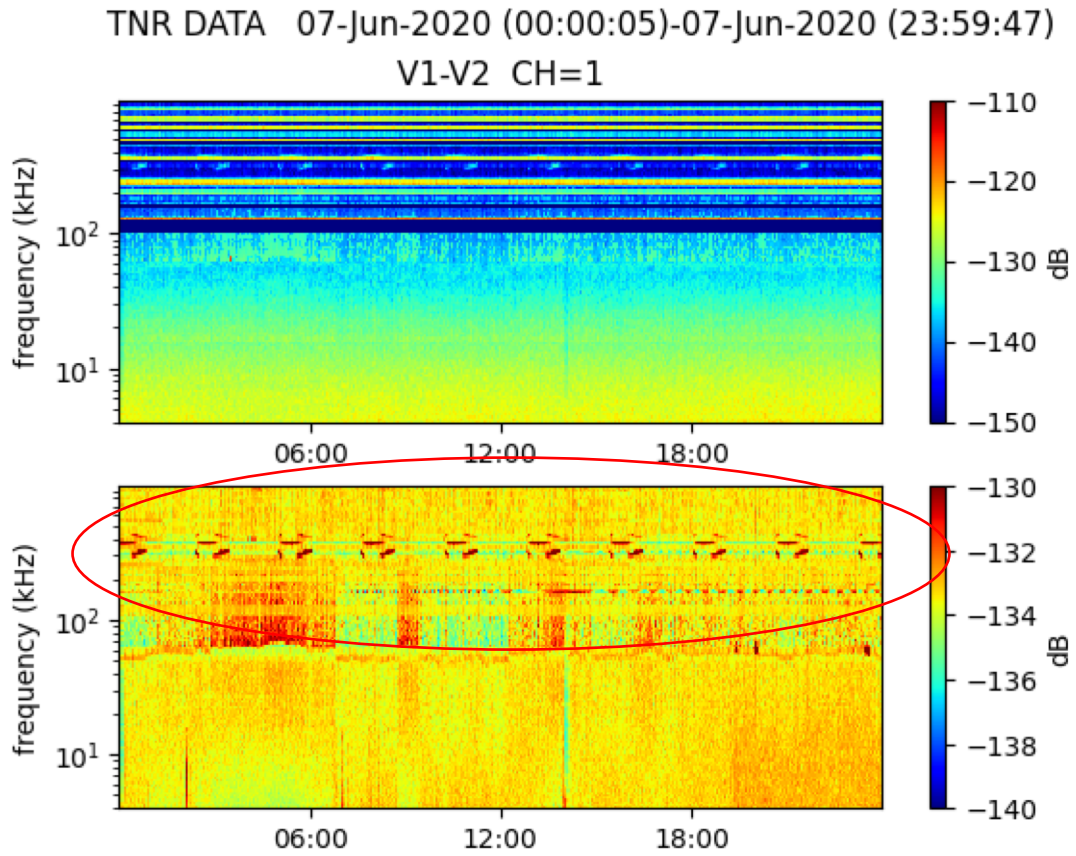
RECENTLY CLOSED ISSUES

- Problem on the THR flight software: sometimes the TNR time value is incorrect → addressed in the CALBAR by calculating the right times through an interpolation with the neighbor times → Patch on THR flight software

- Inversion of the data between channel 1 and 2 when both channels measure TNR. Issue solved by ROC providing new L1 files.

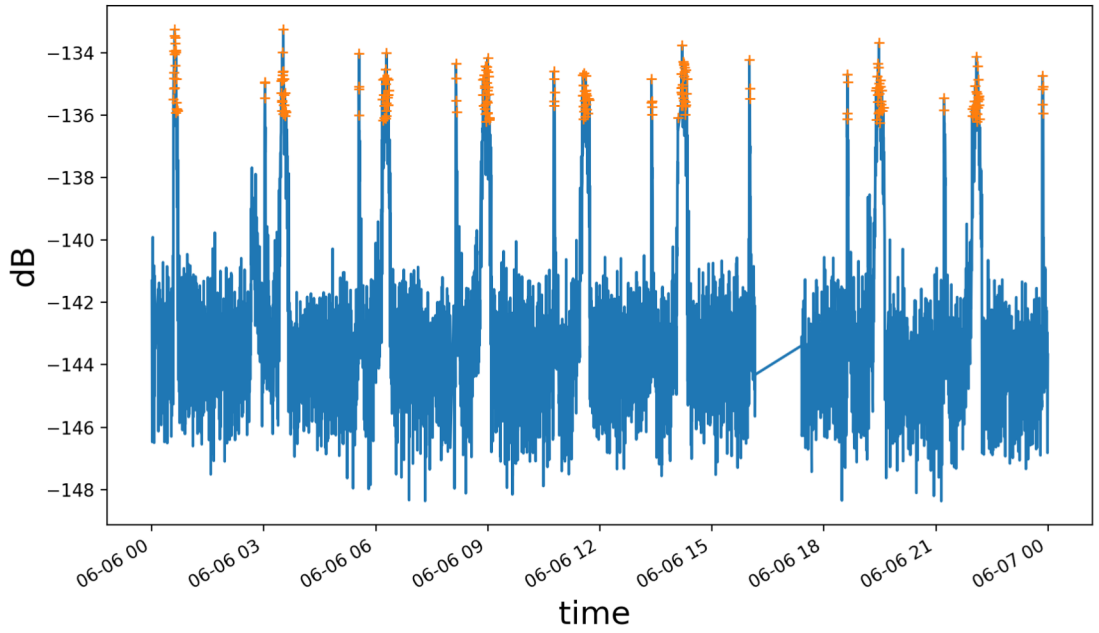
Interference at ~ 300 kHz



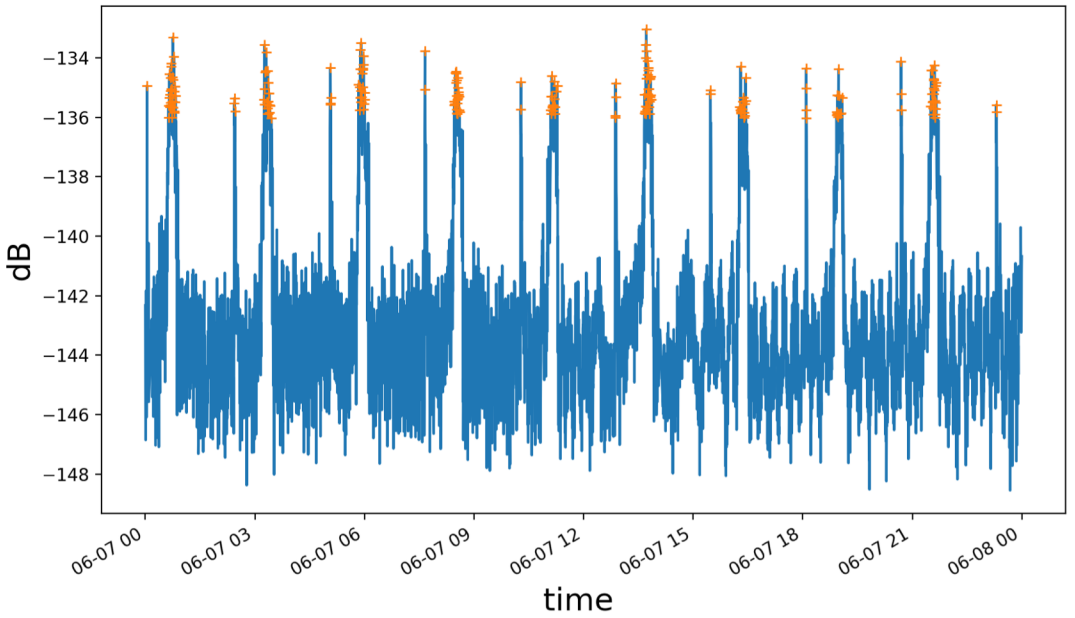


- Appeared on 06/06/2020 0:34:50 and since then always present in the data→ NOT present before
- Characteristic pattern strongly periodic
- Observed at TNR frequencies [290.931, 303.812, 317.263, 331.309, 345.977, 361.295] kHz

06 June 2020 303.812 KHz



07 June 2020 303.812 KHz

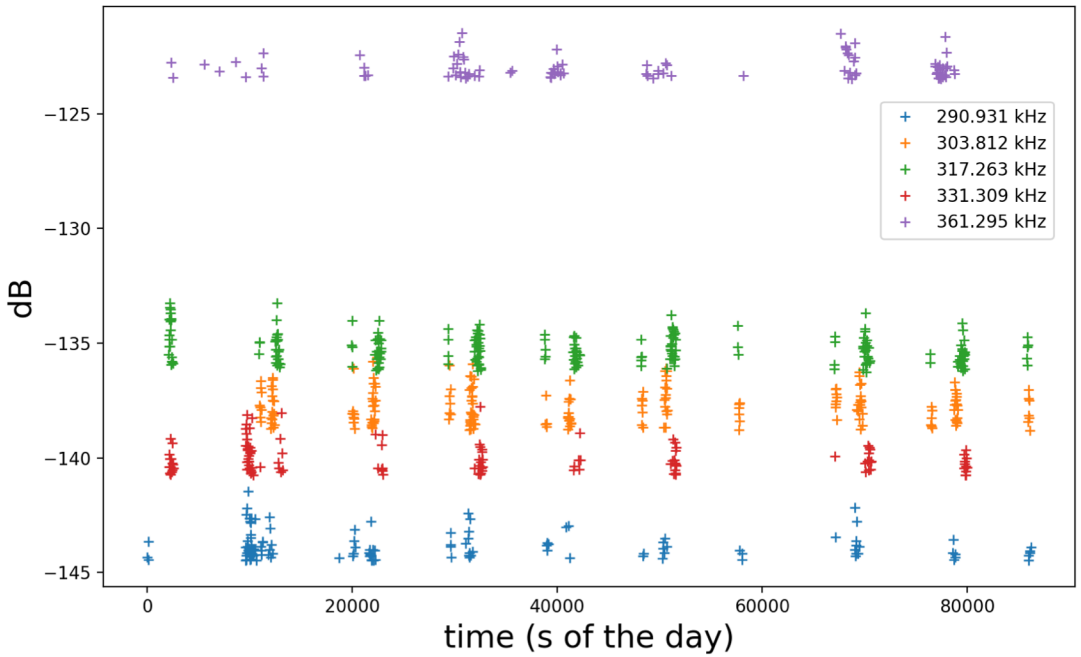


Time evolution of the spectrum at 303.812 KHz:

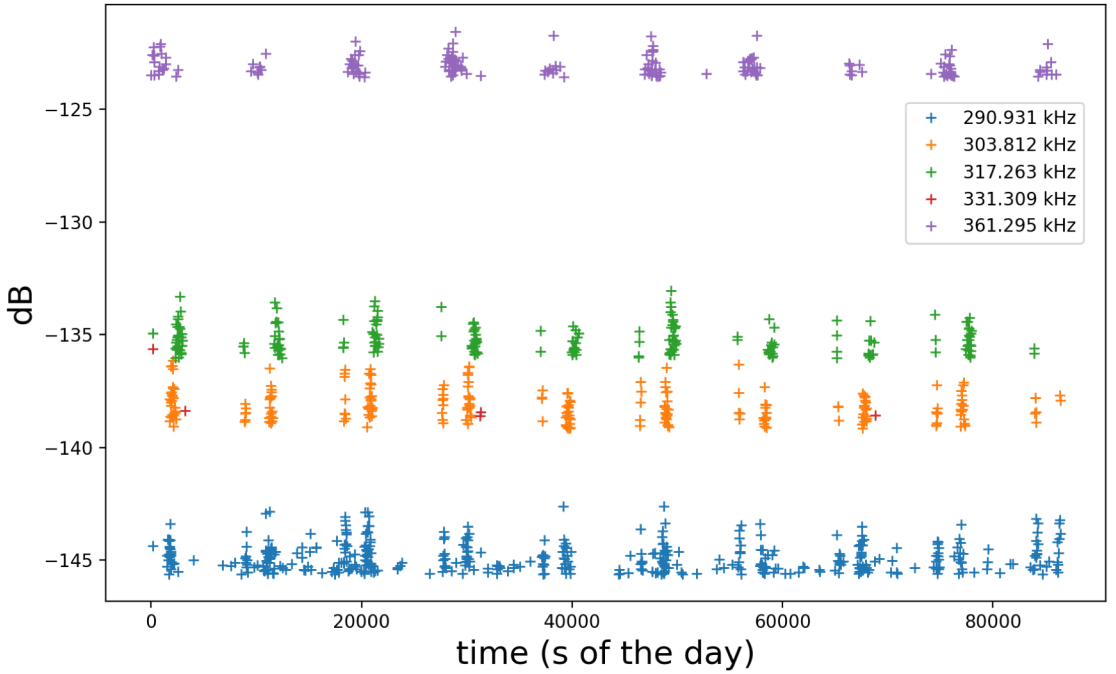
- periodic interference peaks clearly observed
- 2 main periodicities observed

Interferences have the highest power → threshold to select time of occurrence

06 June 2020

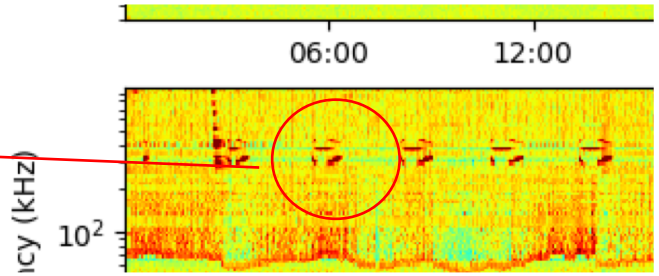


07 June 2020

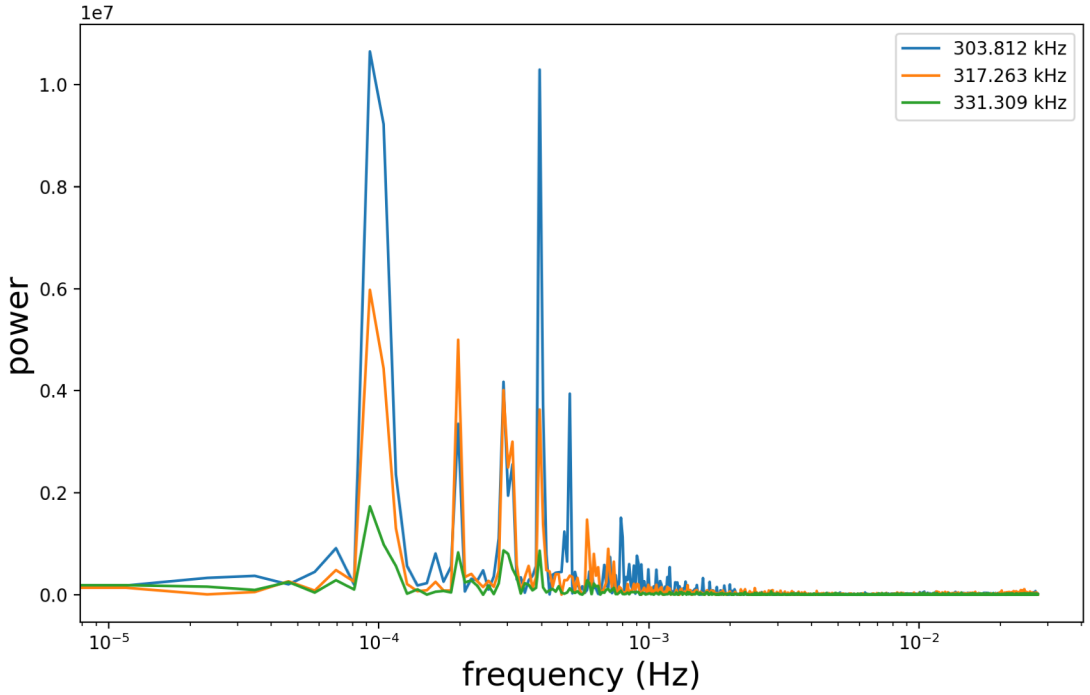


Occurrence of interference lines for all the considered frequencies:

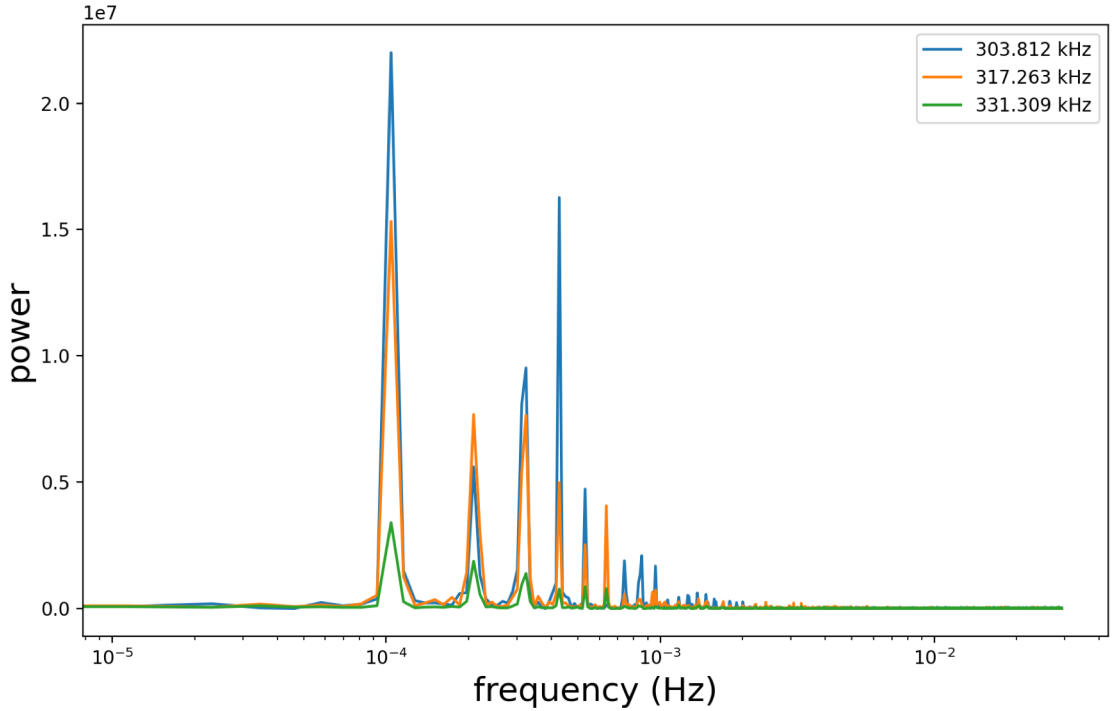
Interference at the frequency of about 331 kHz seems to occur later, this is also clearly visible in the dynamic spectrum.



06 June 2020



07 June 2020

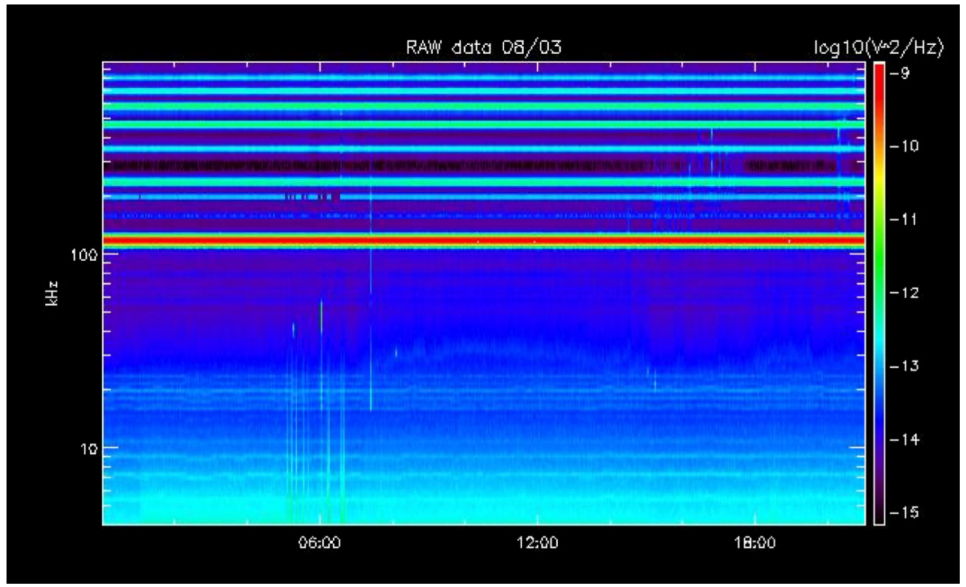


Main peaks associated with this interference:

- 0.0001 Hz / 2.7 h
- 0.0002 Hz / 1.4 h

Possible source:
262 kHz mag heater ?
Star Tracker?

Interference at ~ 120 kHz



TNR

- filtering procedure (on ground) on the data (examples in the following)
- Patch on THR flight software : change parameters of the TNR digital filter to reduce the effect of interference
- Coupling between solar panels and RPW antennas and effect on the 120 kHz

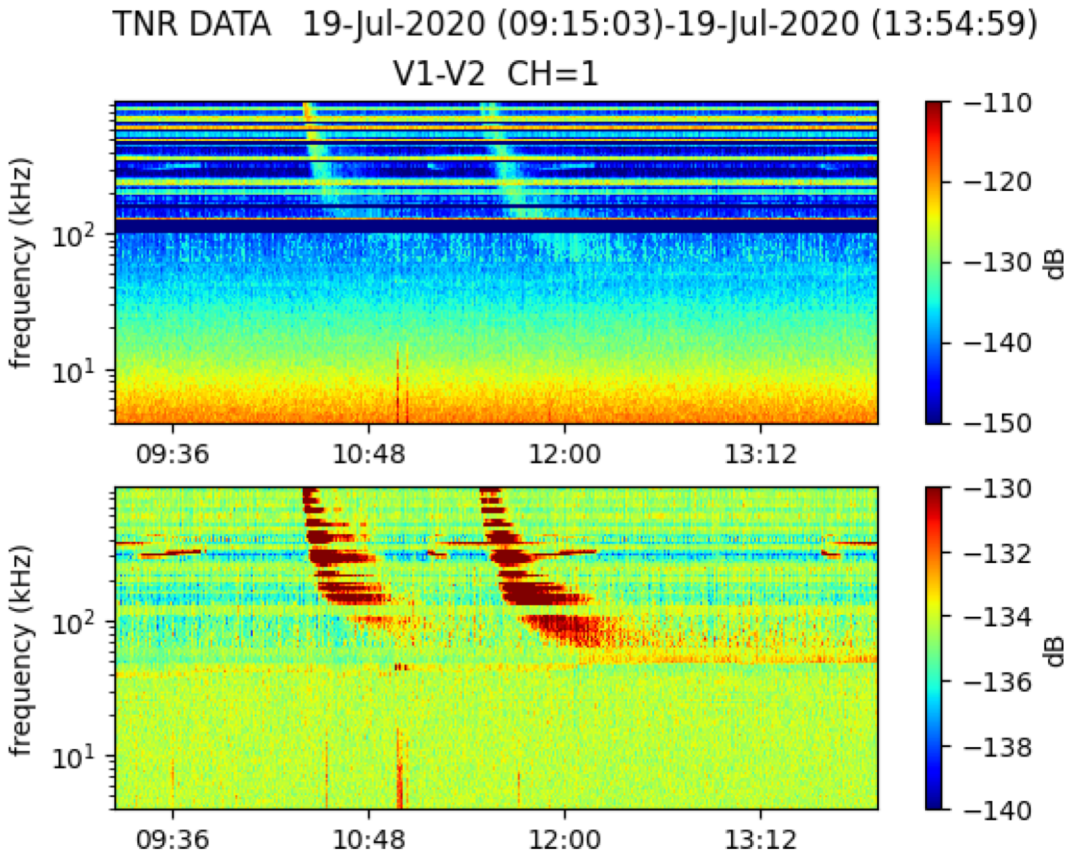
HFR

- Analysis ongoing on targeted measurement campaigns to define the less polluted frequencies of HFR → HFR list mode.

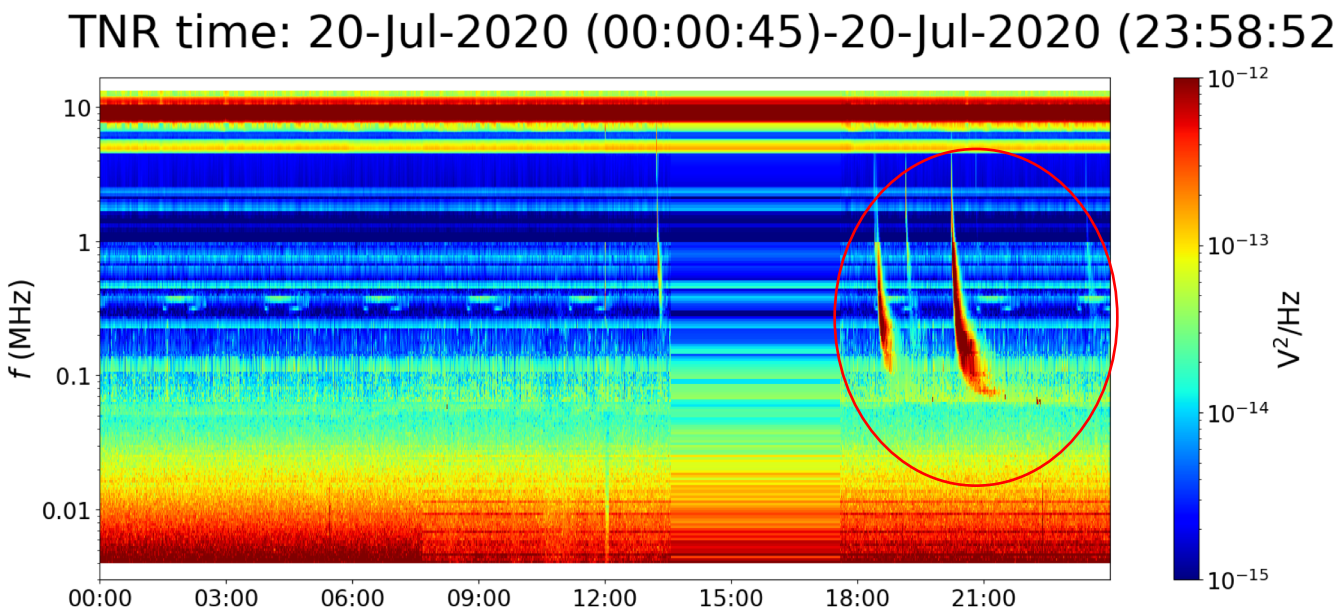
Provide summary plots on (almost) regular basis

- Two kind of summary plot:

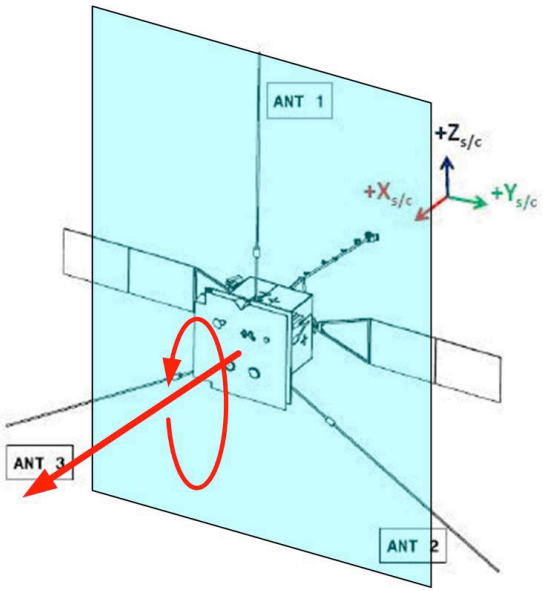
TNR row data + filtered data



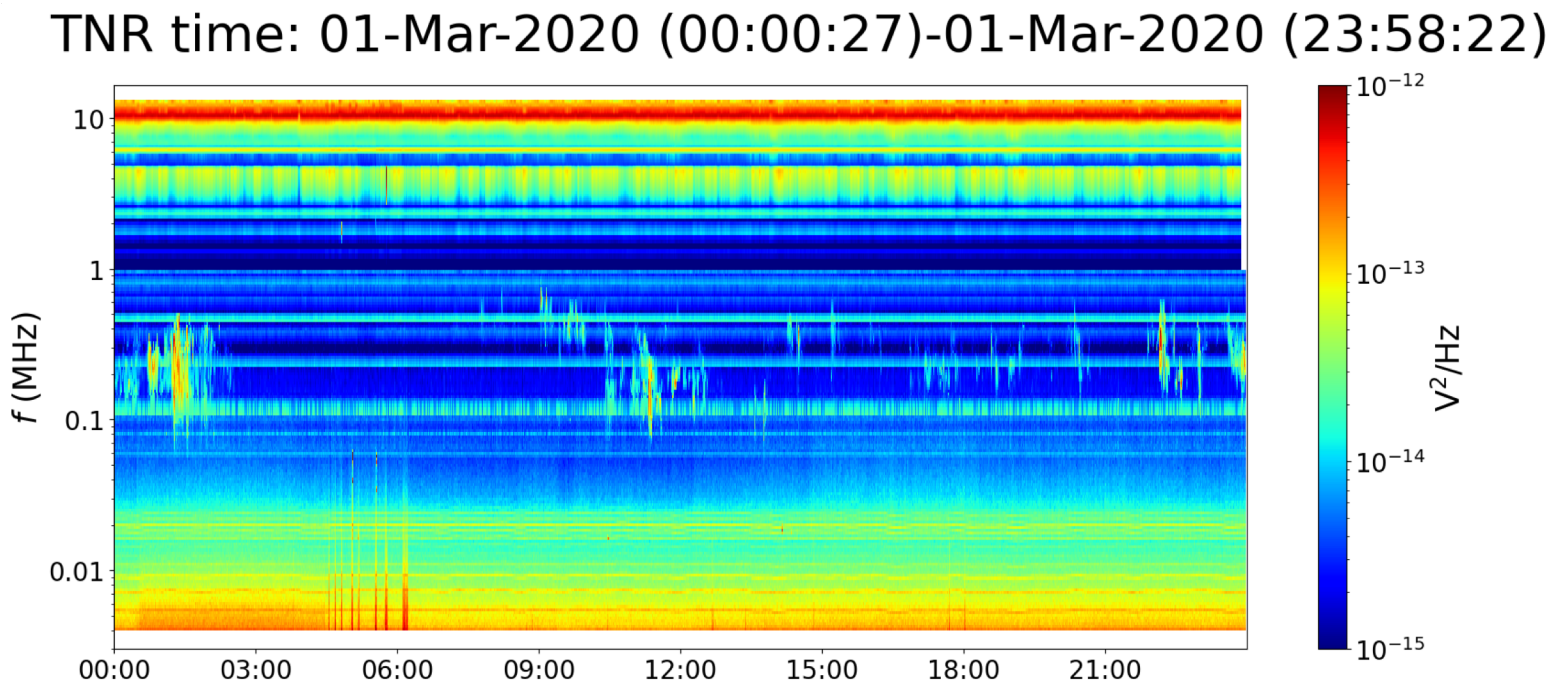
TNR + HFR interpolated data
(in collaboration with V. Krupar)



Solar Orbiter rolls



Measure of AKR having a pure circular polarization (V = +1 or -1) to properly estimate the antenna gain, effective length and vector direction.



<u>UPCOMING</u>: analysis of data acquired during the S/C calibration rolls

TNR-HFR Calibrations Software **CALBAR**

- Convert TNR-HFR L1 files to L2 (system level calibration + Antennas/SCM)
- Written in IDL
- wrapper script for execution by ROC framework
- CALBAR software currently allows to convert TNR and HFR electric data in physical units [V^2/Hz] and TNR magnetic data [B^2/Hz]

- Include quality flag → before releasing data for ESA.

Production of L3 data

Discussion are started in the THR team from the production of L3 data.

- Direction finding data
- Plasma frequency from THR peak tracking