RPW / SCM

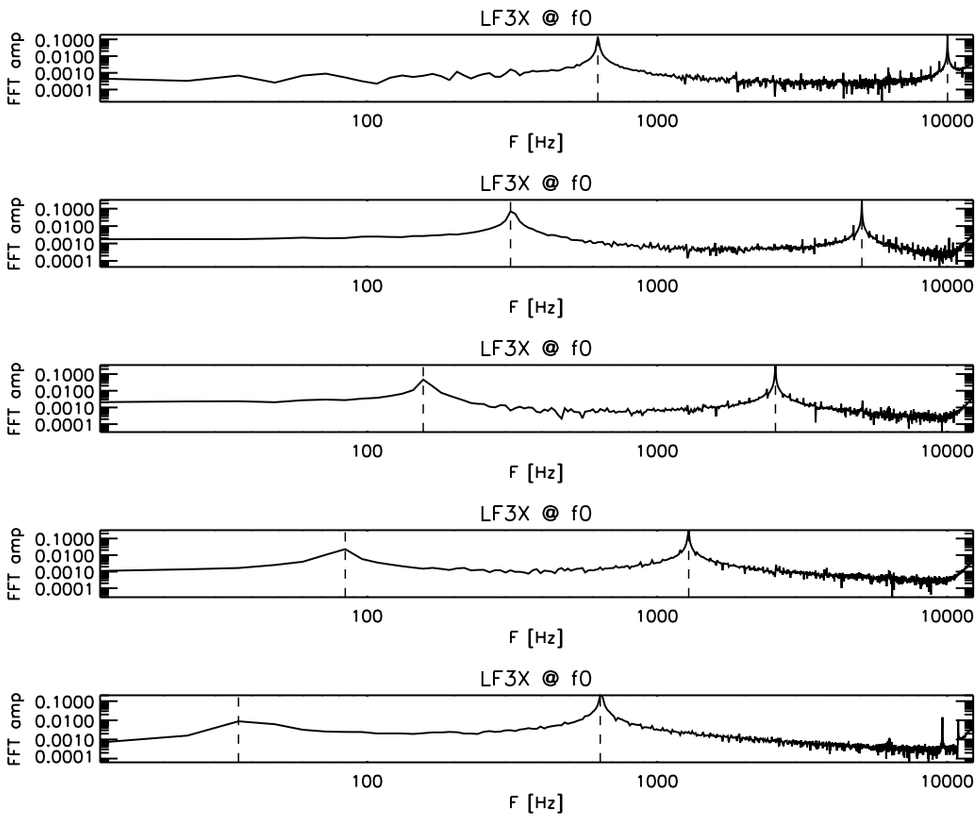
The RPW/Search Coil Magnetometer onboard Solar Orbiter

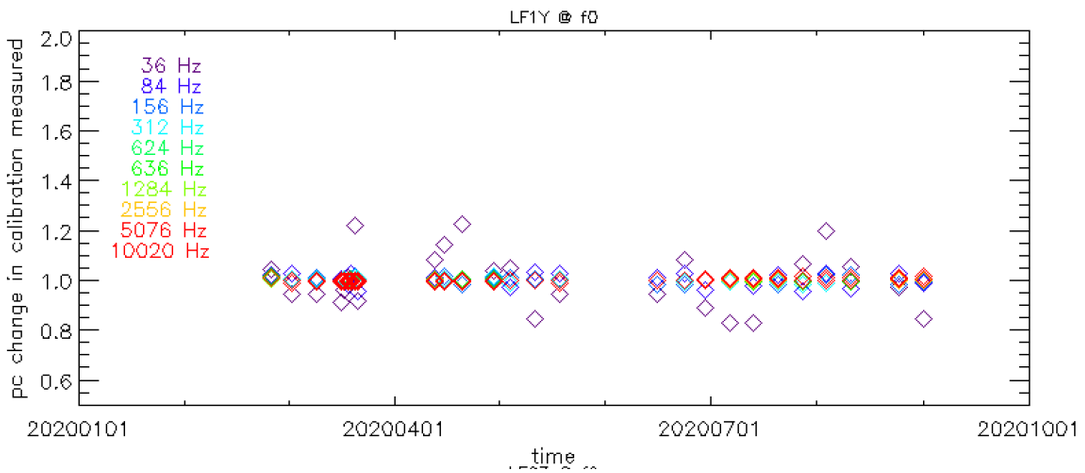
Matthieu Kretzschmar
and the SCM team
Volodya Krasnoselskikh, Jean-Yves Brochot, Guillaume Jannet, Thierry Dudok de Wit, Clara Froment, Jeremie Pragout, Milan Maksimovic, Thomas Chust, Olivier Le Contel, Jan Soucek, David Pisa, ..

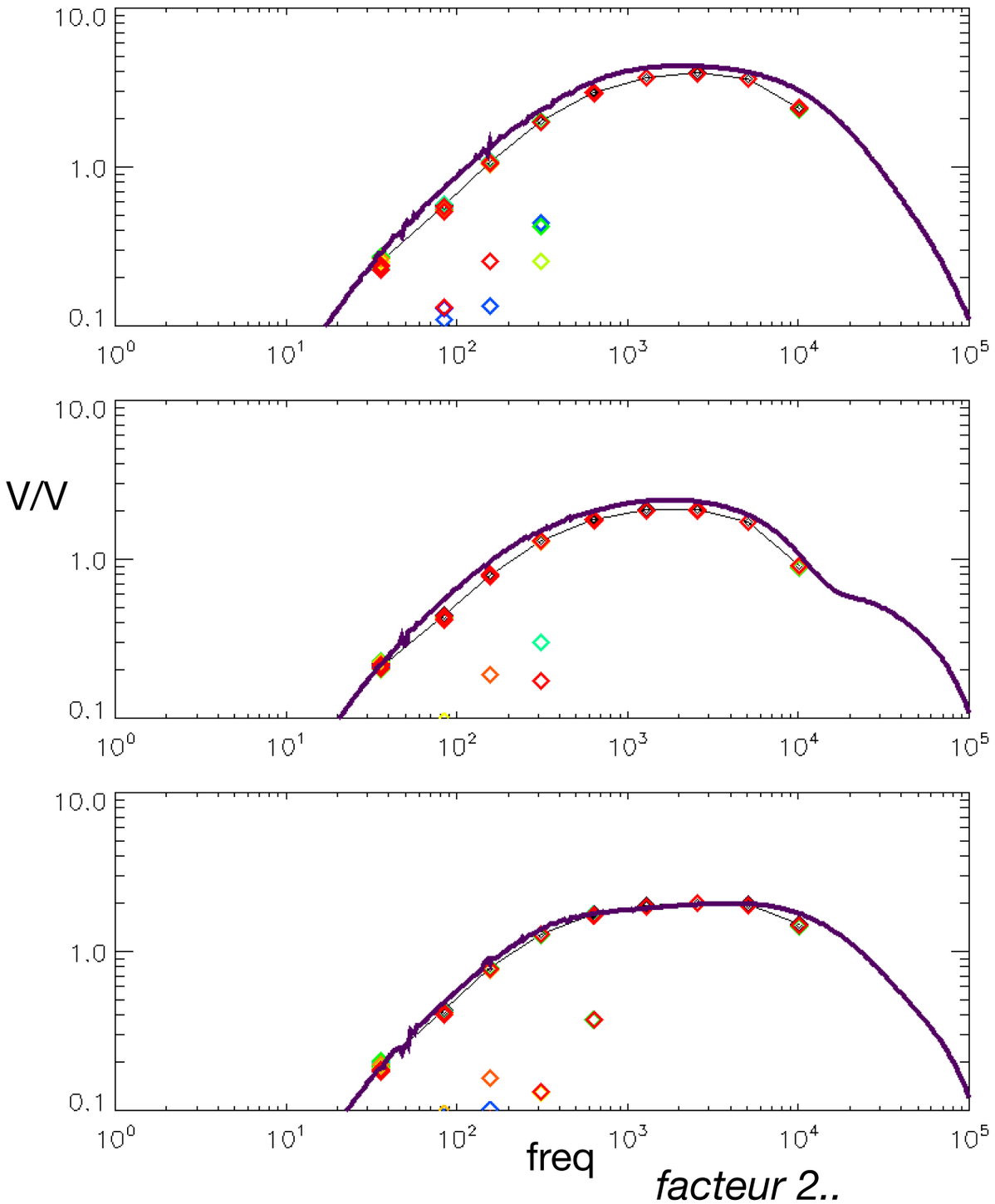
Overview

- SCM is performing well.
- New team member: Jérémie Pragout
- Unchanged frequency response of SCM
- SCM affected by HI and EUI
- Software: new version of squeletons & scmcal: quality bitmask is set (bit0: SCM outworking or unknown temperature, bit1: SCM heater on/off transition, bit2: LFR onboard calibration signal is ON)
- Data overview

SCM onboard calibration



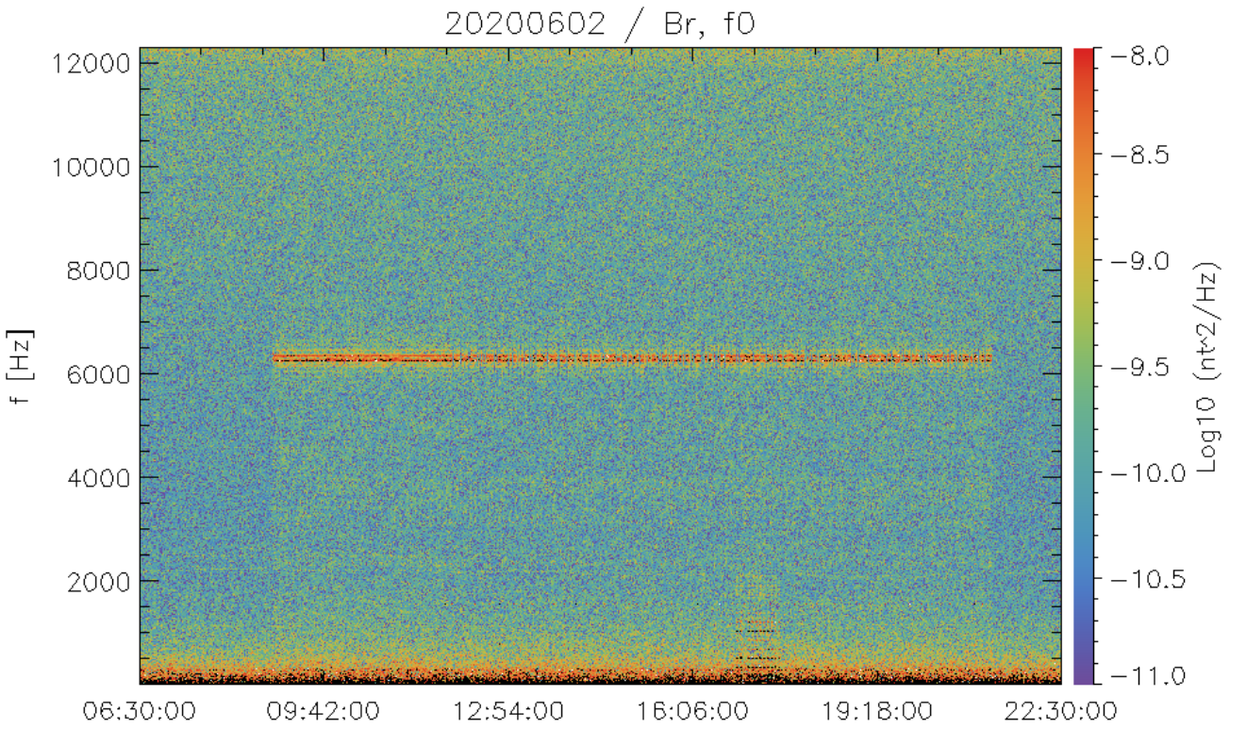


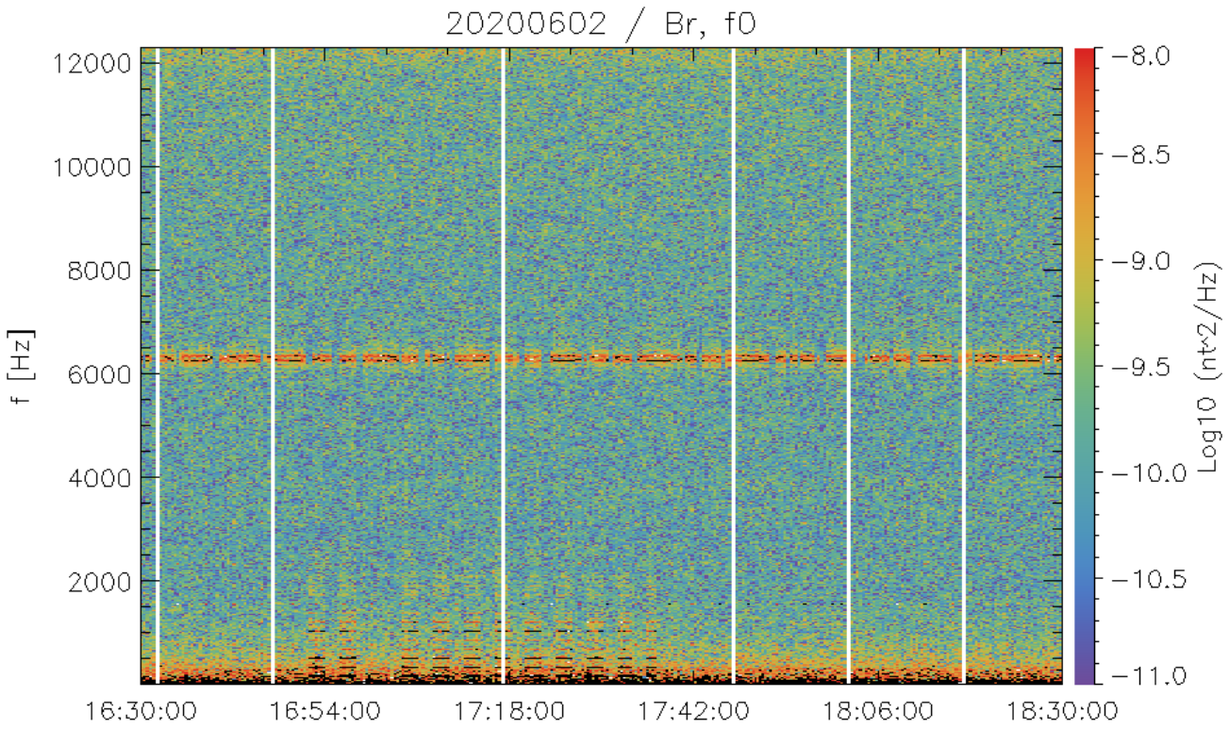


facteur 2..
impedance factor

➡ Unchanged frequency response of SCM

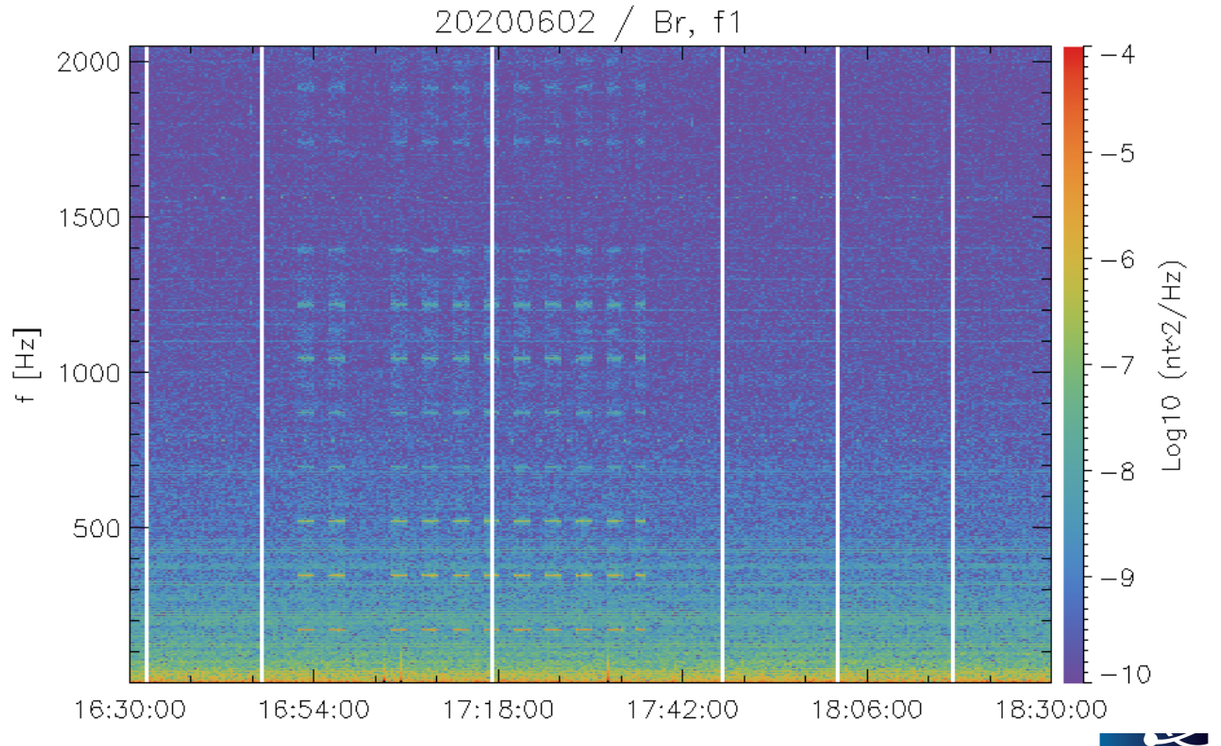
Results from EMC campaing



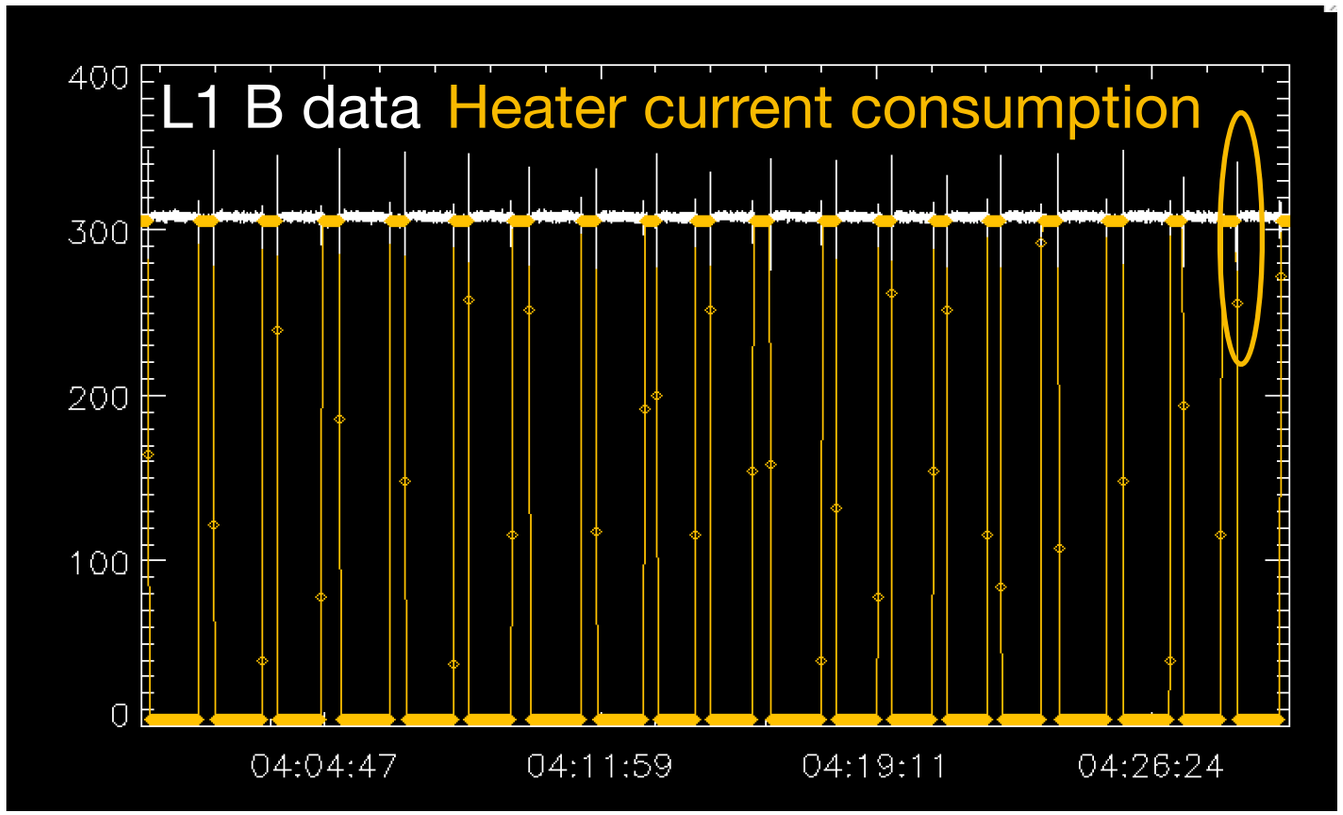


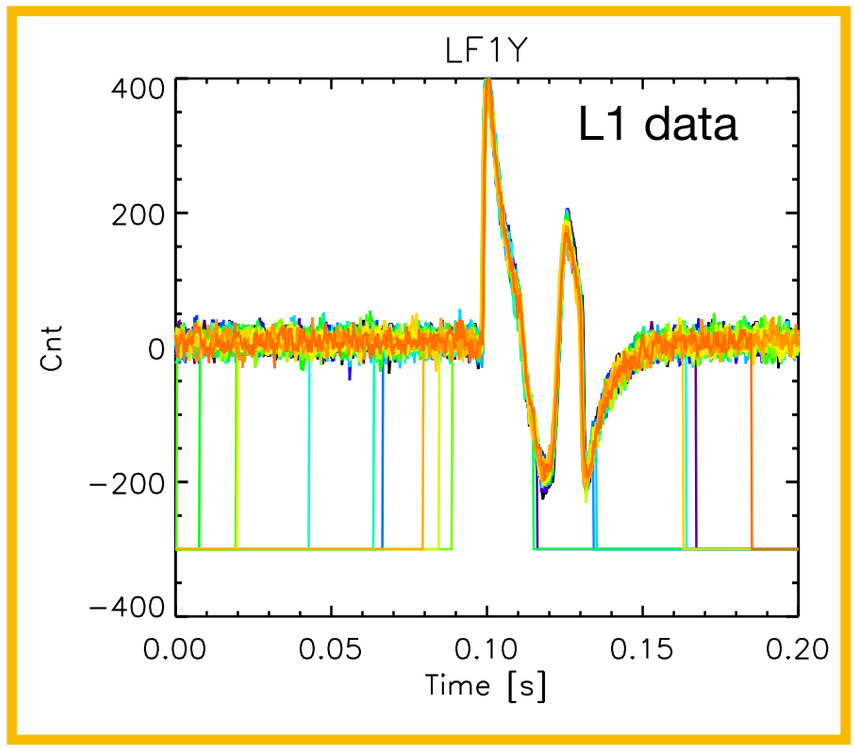
8:47: SoloHI standby power on
21:17 SoloHI Off
16:47 EUI to EMC Mode 2
17:47 EUI to EMC Mode 1a+

Other instruments do not seem to affect strongly the magnetic field



SCM heaters

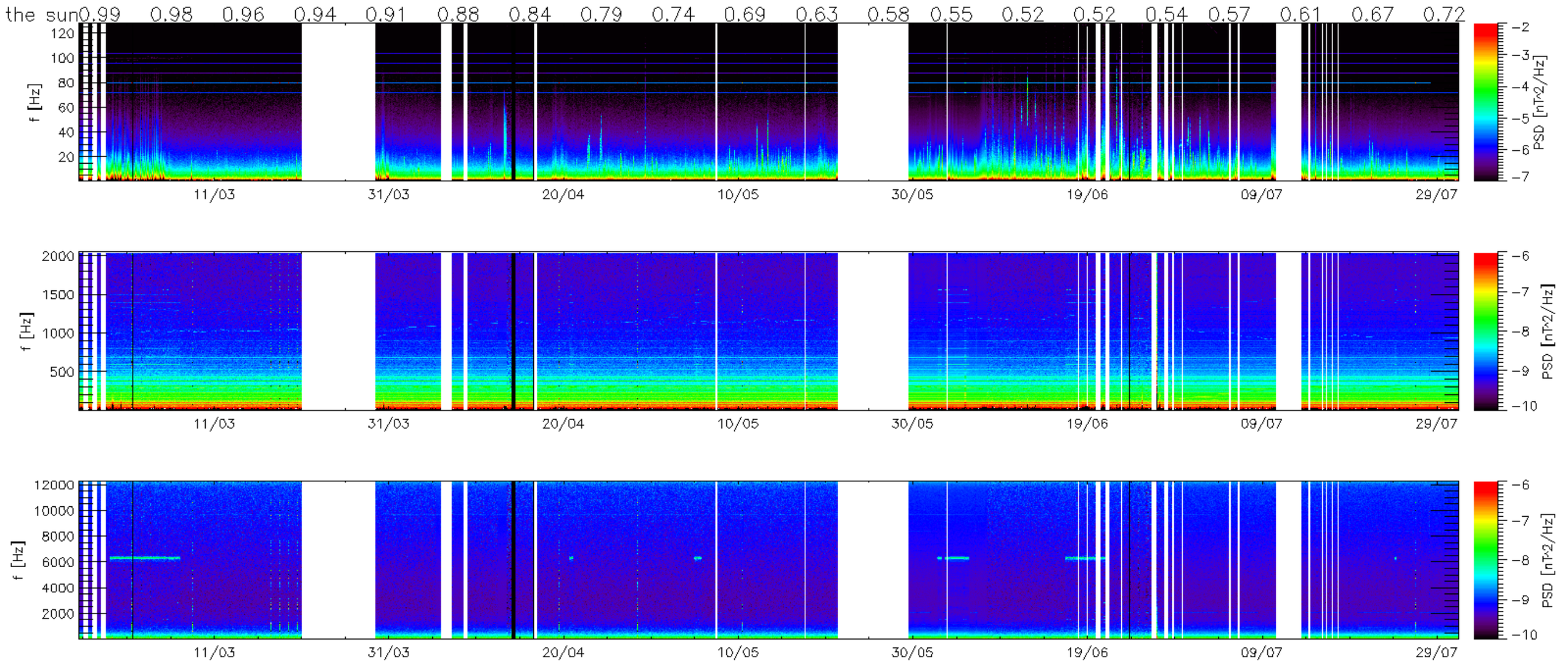




- "heater events" are now flagged with bitmask; time precision will be improved soon.
- Impact on the calibration of the snapshot containing the event ongoing

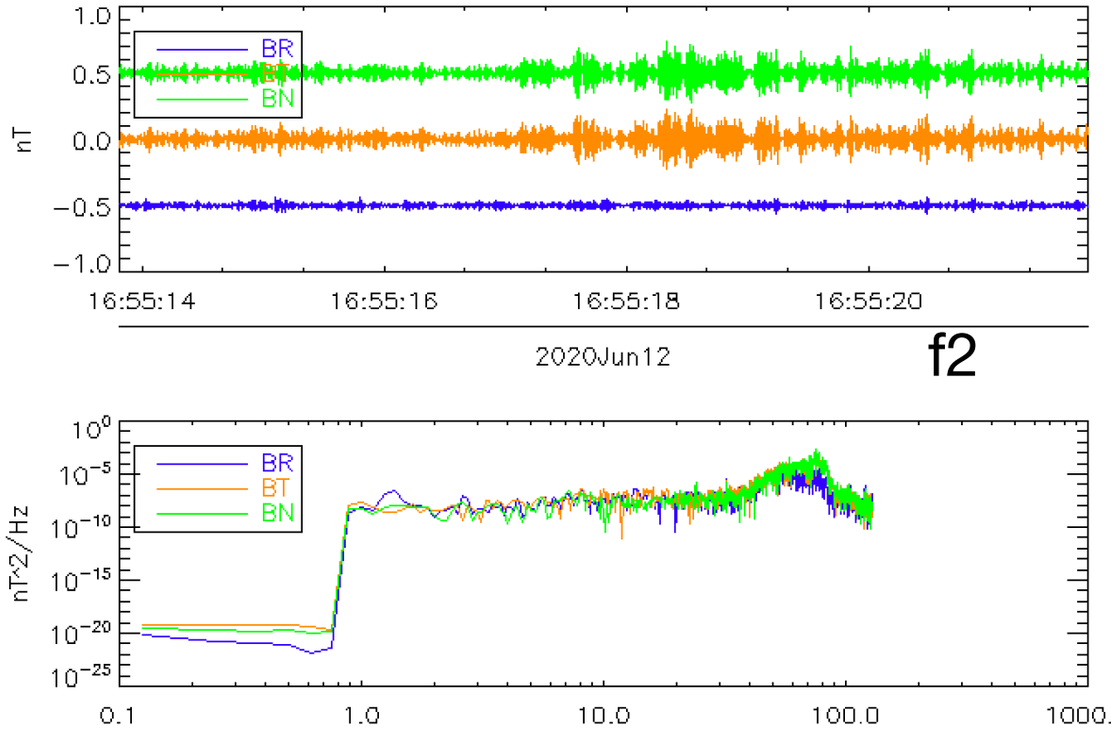
- For spectrogram representation, the actual solution is to replace the event by noise
- Heater current consumption unchanged (0.92W)

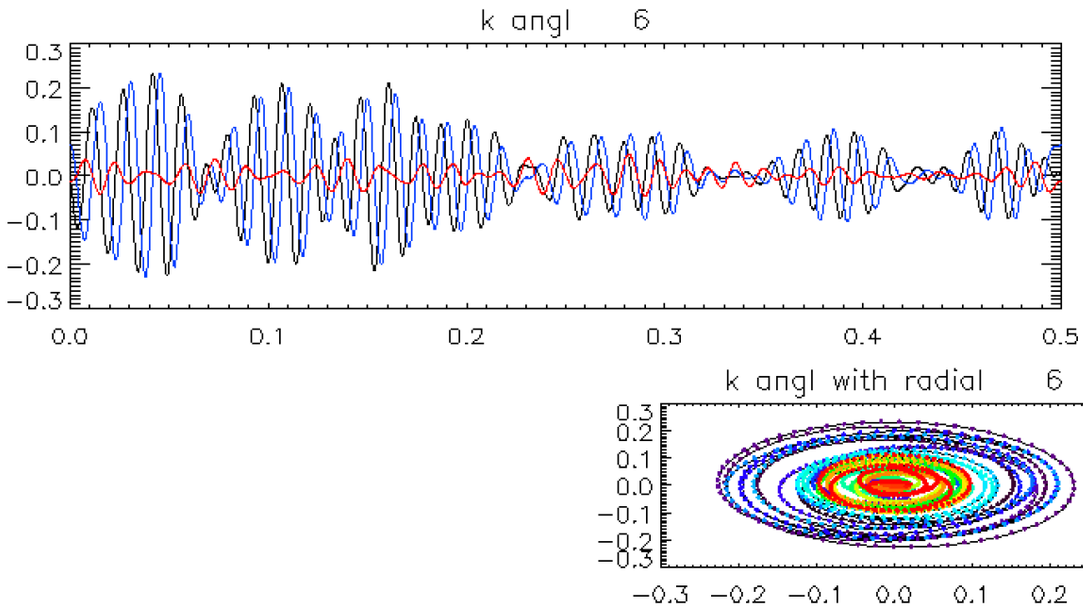
SCM mission data

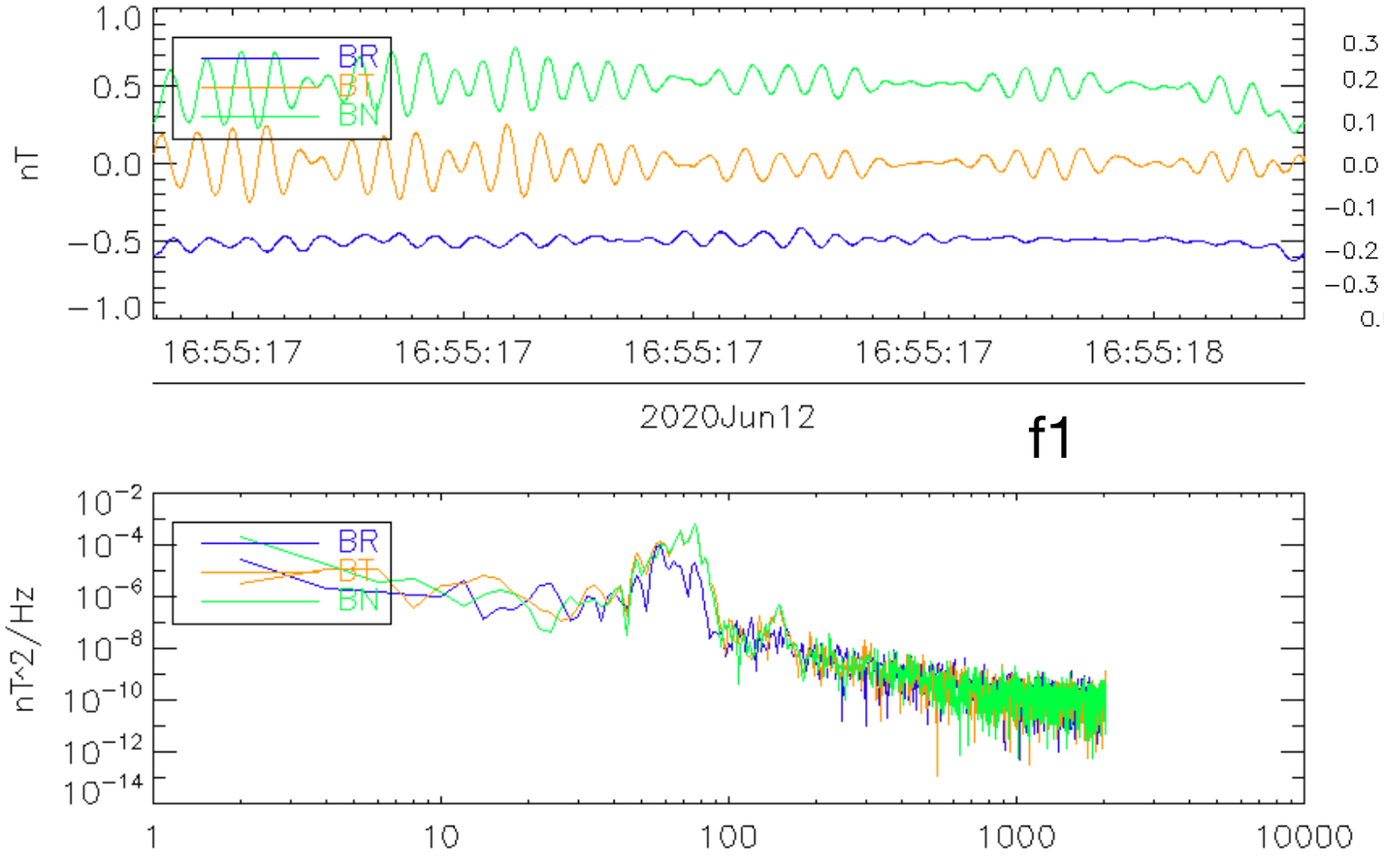


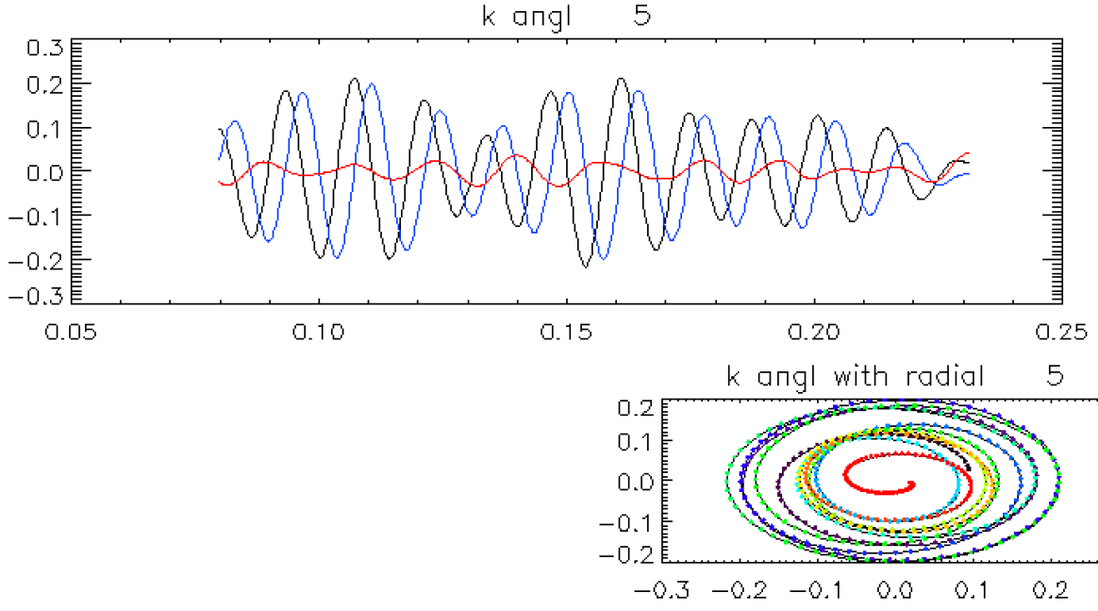
- SCM is performing well, some science can be done !

- note that physical signal is getting rare where getting far from the Sun

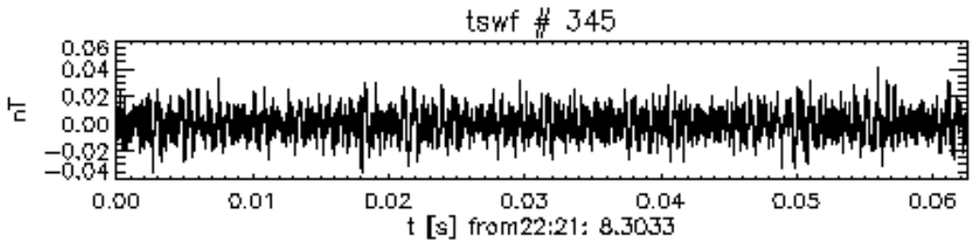

BR
BT
BN
nT
1.0
0.5
0.0
−0.5
−1.0
16:55:14
16:55:16
16:55:18
16:55:20
2020Jun12
f2
nT^2/Hz
10^{0}
10^{-5}
10^{-10}
10^{-15}
10^{-20}
10^{-25}
0.1
1.0
10.0
100.0
1000.0

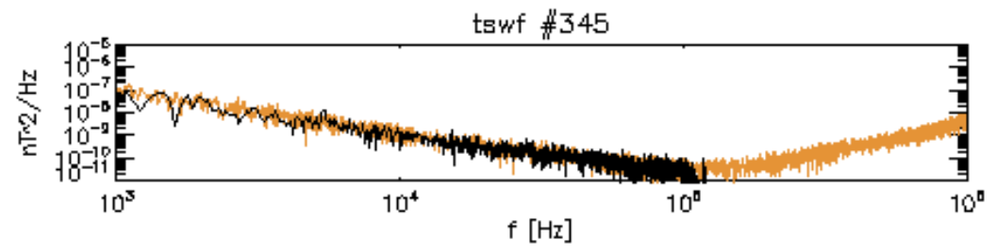

k angl 6
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
0.0
0.1
0.2
0.3
0.4
0.5
k angl with radial 6
−0.3
−0.2
−0.1
0.0
0.1
0.2
0.3

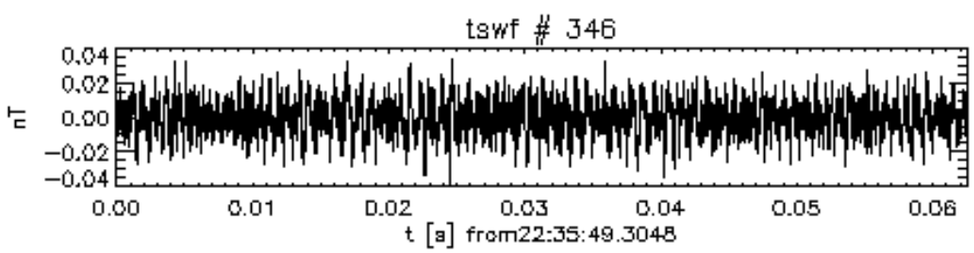

BR
BT
BN
nT
1.0
0.5
0.0
−0.5
−1.0
16:55:17
16:55:17
16:55:17
16:55:17
16:55:18
2020Jun12
f1
nT^2/Hz
10^{-2}
10^{-4}
10^{-6}
10^{-8}
10^{-10}
10^{-12}
10^{-14}
1
10
100
1000
10000

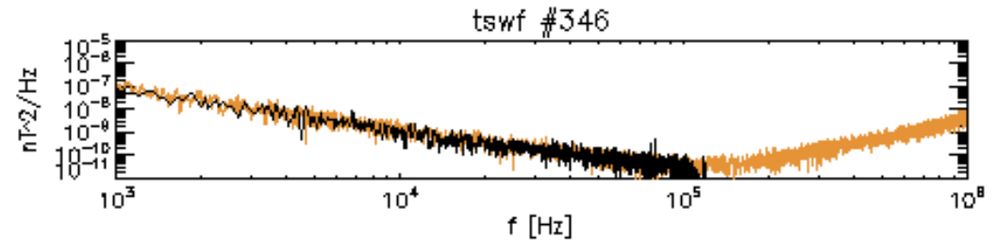

k angl 5
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
0.05
0.10
0.15
0.20
0.25
k angl with radial 5
0.2
0.1
0.0
−0.1
−0.2
−0.3
−0.2
−0.1
0.0
0.1
0.2
0.3

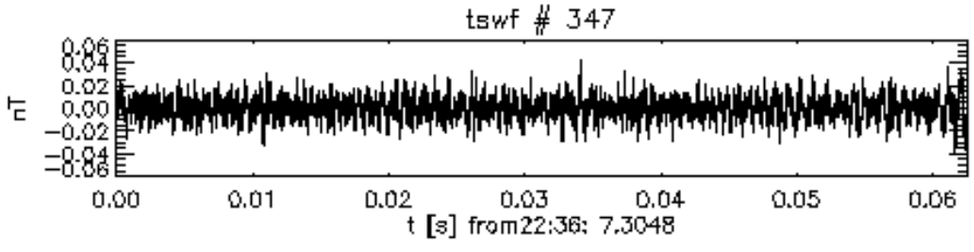
SCM MF data (20 June)

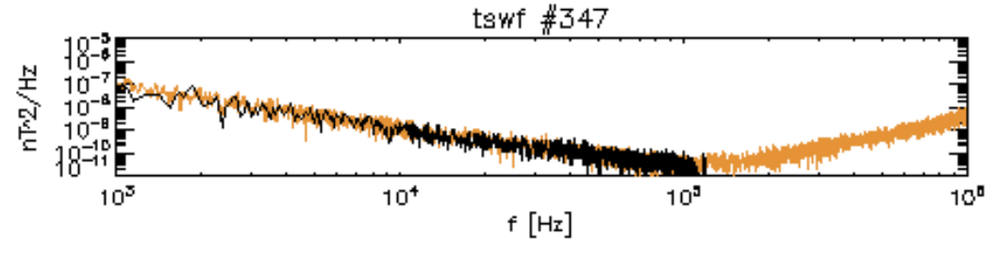


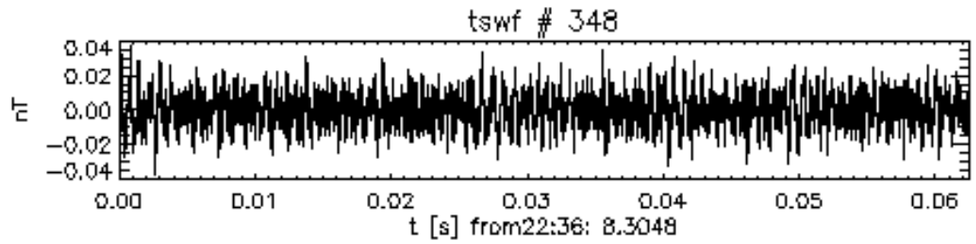


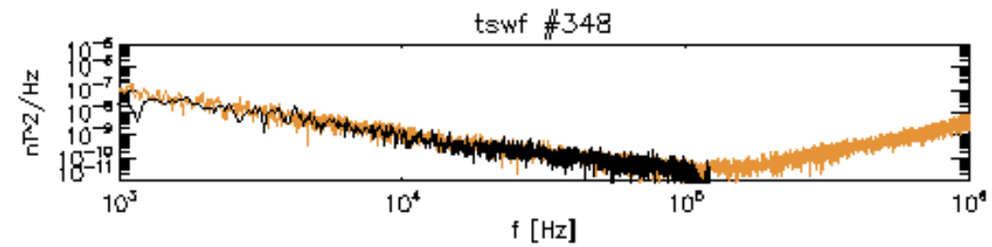


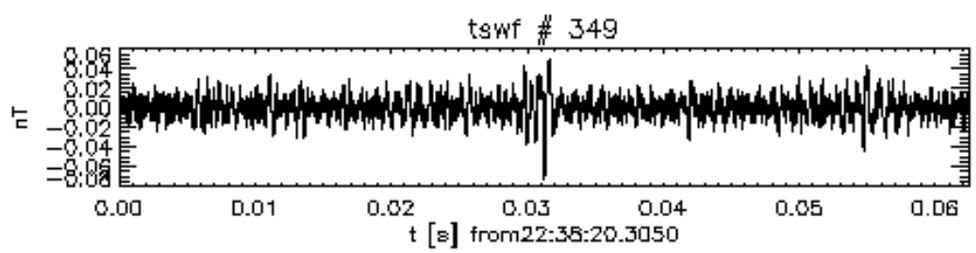


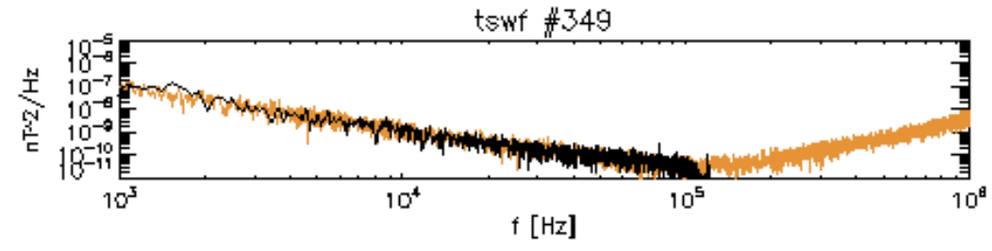


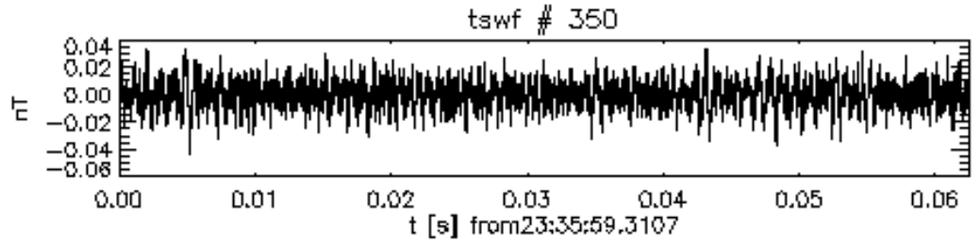


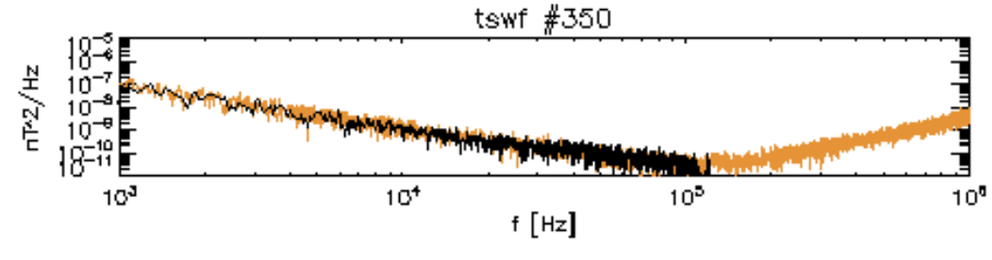








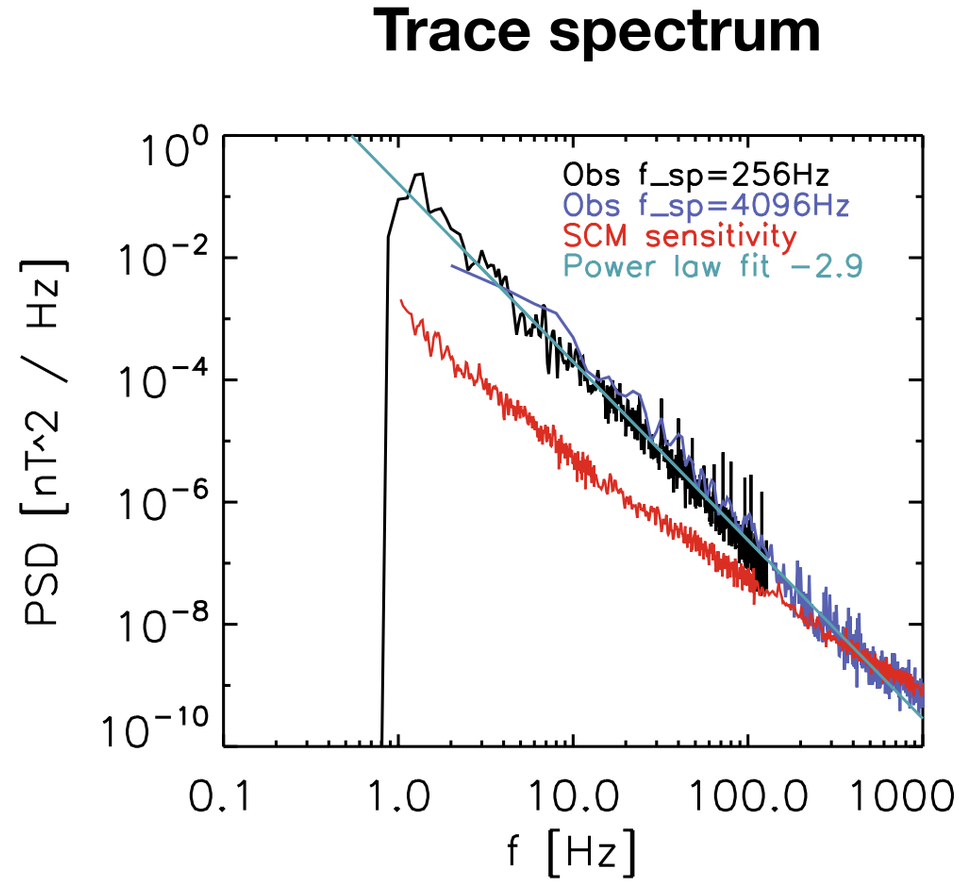




take home

- SCM LF are quite ok, but have interfacts: Spacecraft and SCM heaters mostly

- Can be used for waves and turbulence studies, get in touch

- You can search for hidden signal in SCM MF channel

- Currently working on:
  - readme file to use SCM data
  - SCM in flight performance paper
  - Whistler overview