TBB Status

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for the LOFAR-CR Team

Hard- and Firmware status

- In general they work!
- Time stamps (generated by RSP boards)
  - "last frame in second" bug is fixed
  - "odd seconds offset" issue at 200MHz sampling rate was declared a "feature"
    - Easy to correct in software
    - Possible problem with VHECR trigger needs testing
- Nyquist zone information will be added with metadata
- Still some stability issues
  - Sometimes they "forget" their settings.
  - Hard to track down.

Data Dump Modes

- Two ways to get TBB-Data

1) Old way: dump to LCU
   - Reliable
   - Slow: 15min for 0.5 GByte -> 4h for a full dump of 1 TBB
   - Inconvenient: files wind up on the LCU, need conversion

2) Dump to CEP
   - Data is sent as UDP packets to a storage node (currently list001)
   - Faster, more convenient, but (up to now) less reliable
   - 30 seconds for 0.5 Gbyte → 8 minutes for a full dump of 1 TBB
   - Includes conversion to HDF5 files

■ The problem is (was?!) `tbb2h5` the program that receives the data at CEP and generates HDF5-files

1) At first TBB Busy Week:
   - Got it running in general.
   - Had some problems: mainly memory leaks and speed

2) Second Busy Week
   - Plugged memory leaks before BW
   - Still speed/latency issues: lost data packets even at slow transmit speeds and with large internal buffer

3) Reworked `tbb2h5` into `TBBraw2h5`:
   - Increase in processing speed (~factor 5)
   - Multi-threading to address latency
   - Data-loss rate now about $2.5*10^{-6}$ (10 packets out of 4 million)

Dump-Script

- Before: type commands for each step (prepare/record/stop/dump) on station and datastorage
- Now: use a script instead
  - Initiative and major work: Mattheijs Eikelboom
  - Extensions during busyweek:
    - Use of configuration file (before: only command-line options)
    - Sets default values if none are given
  - To be fixed/done:
    - Also set RCUs (optionally)
    - Add some more parameters to config file (directories etc.)
    - Incorporate in trigger algorithms
    - Use multiple stations
    - Speed optimisation
- Future: full TBB control by MAC/SAS
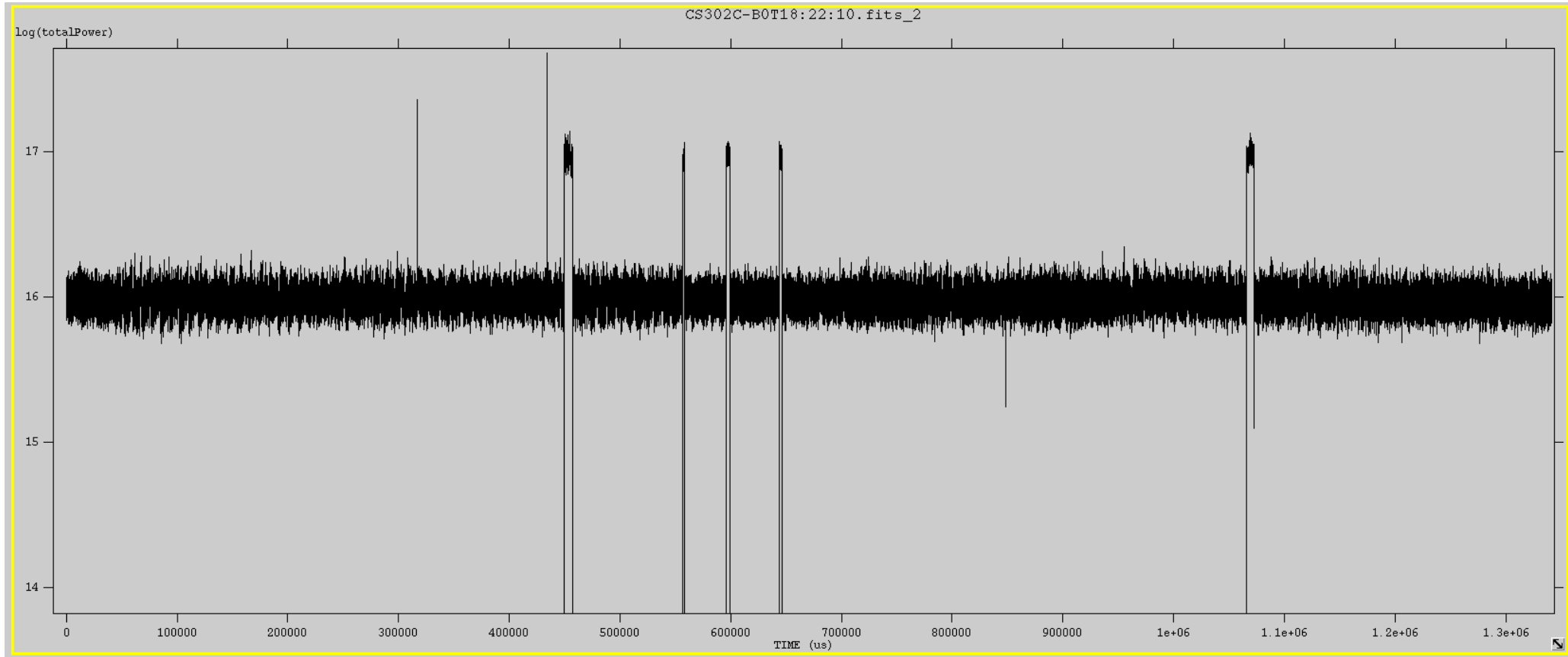
CS302C-B0T18:22:10.fits_2
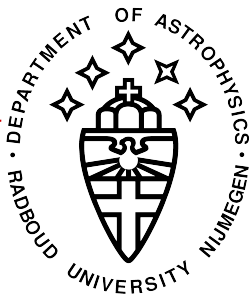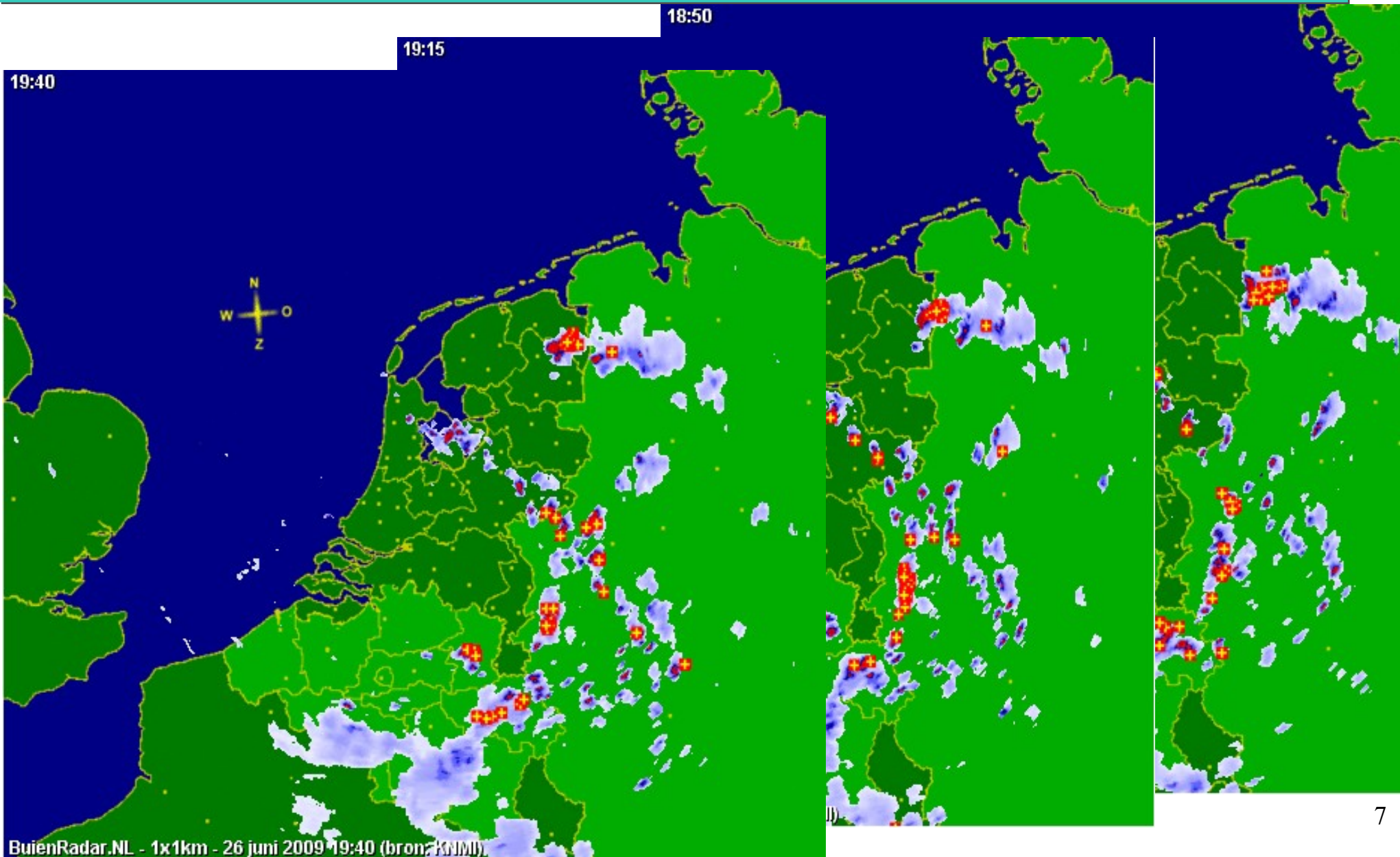
BuienRadar.NL - 1x1km - 26 juni 2009 19:40 (bron: KNMI)

VHECR triggering

- No real news (were busy with DAQ)
- In the last tests of the TBB trigger we had:
    - Bad data for some settings (AFAIK not fixed yet)
    - No triggering on some channels (fixed?)
    - Crashes of the TBB during trigger testing (fixed?)
- LCU trigger:
    - Very preliminary version is implemented but not yet tested.
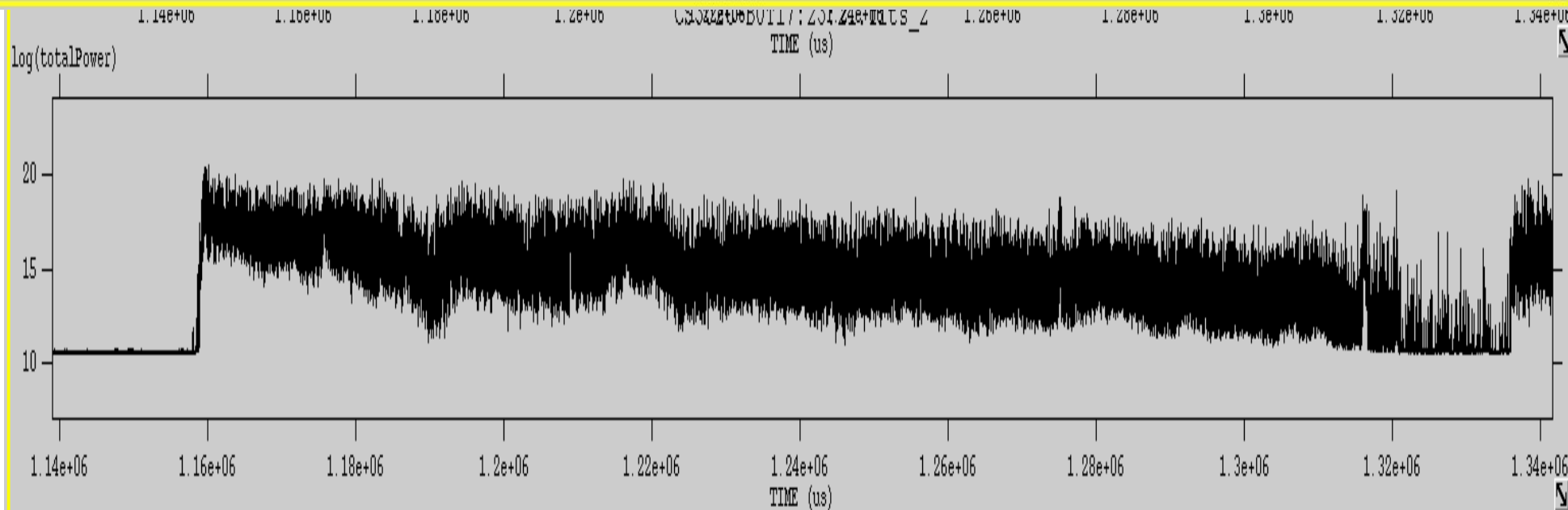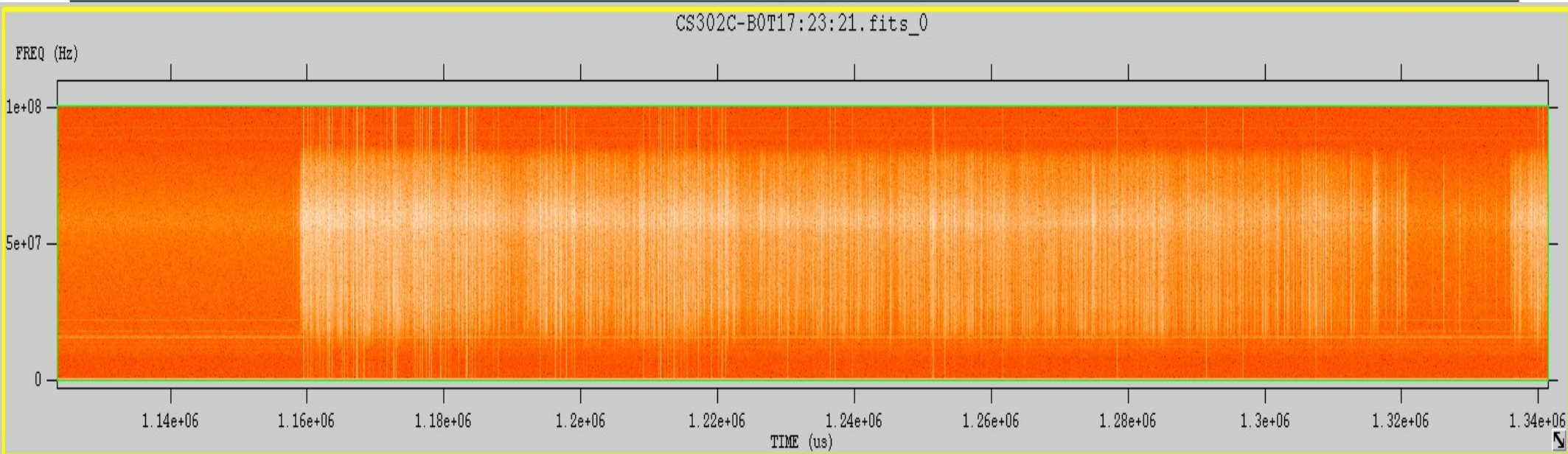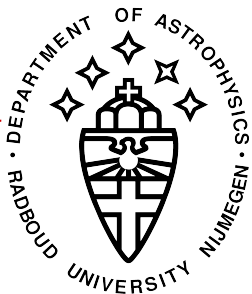
Lightning observation

- Lightning storm on friday June 26th
  - Opportunity to test the dump script
  - In **parallel** to an LBA stability observation
  - Repetitive dump of 6 dipoles at 5 positions
  - Limited by processing speed of tbb2h5 (8 minutes)
  - Hope for the best
  - Forgot to set CRC check and last second flags
- Found 3 major events before 19:00 UTC
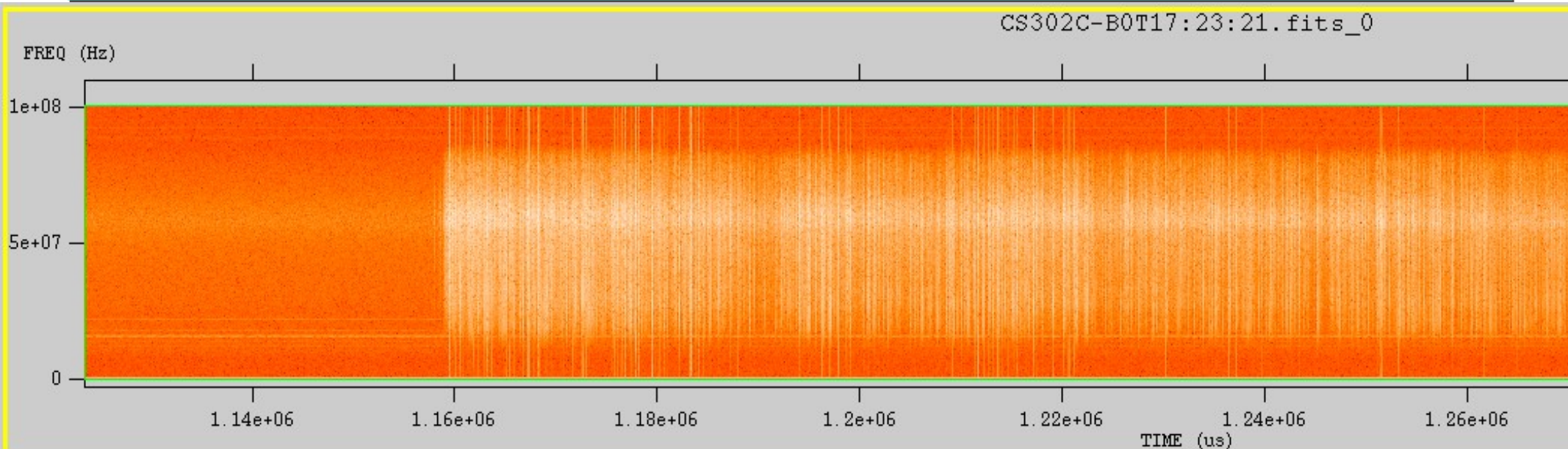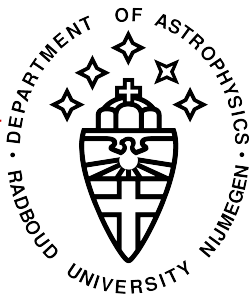- Need to analyze data and check for events after 19:00 UTC

Lightning observation

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CS302C-B1T16:48:58.fits_2

CS302C-B1T16:48:58.fits_2

Lightning observation

CS302C-B1T16:48:58.fits_2

CS302C-B1T16:48:58.fits_2

Lightning observation

Lightning observation

Worklist
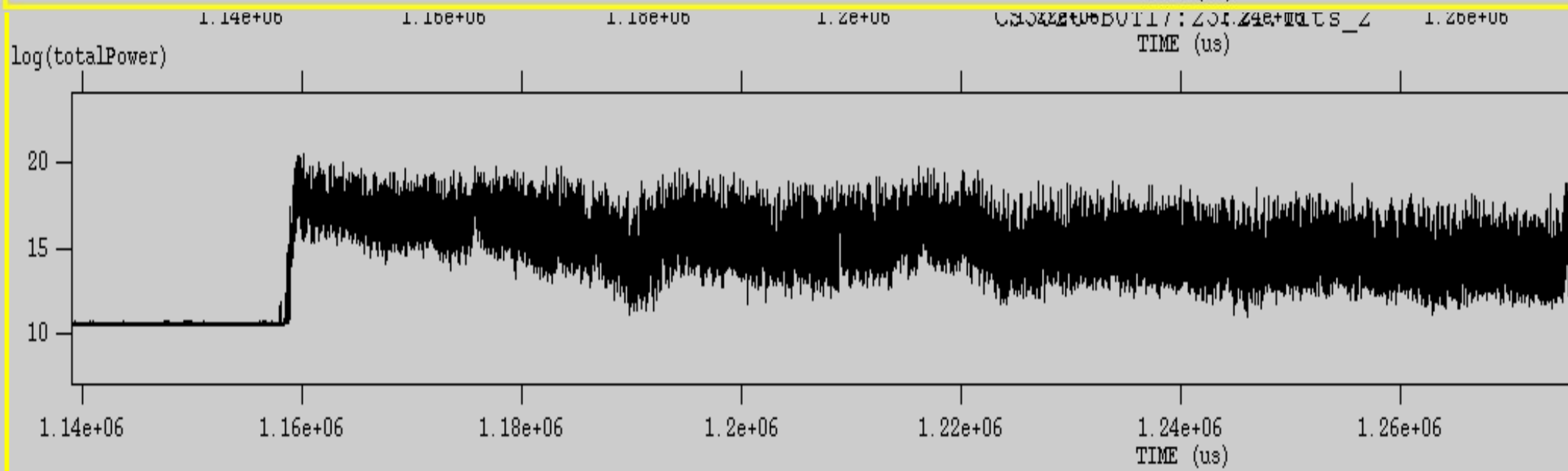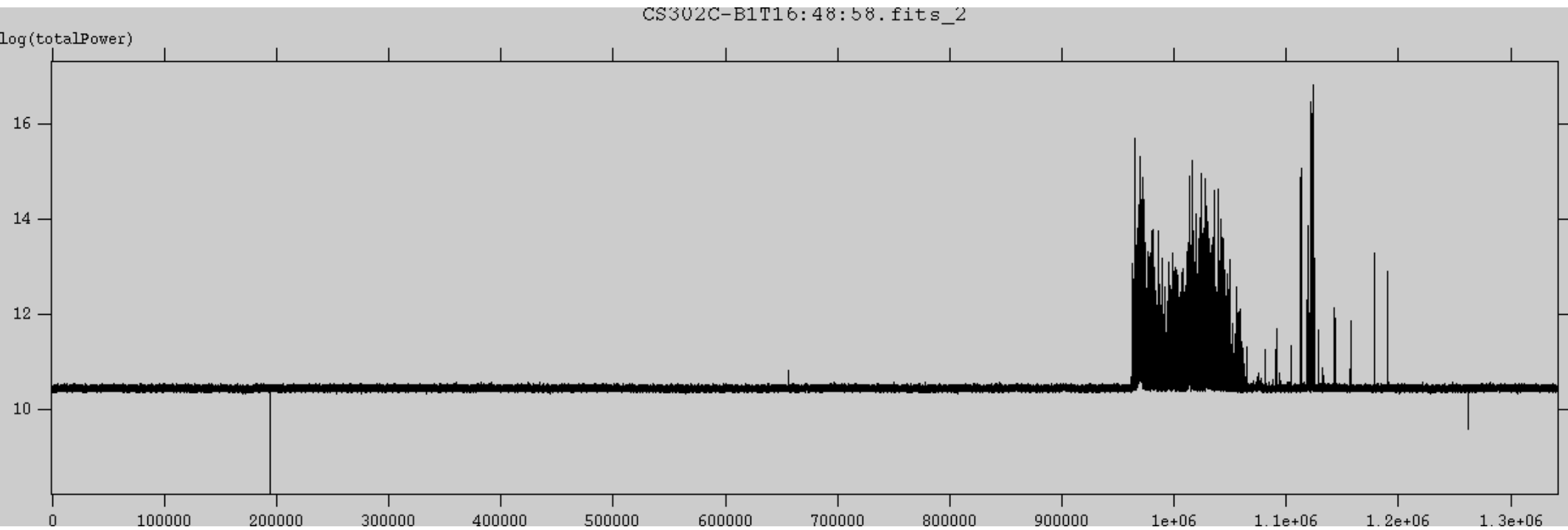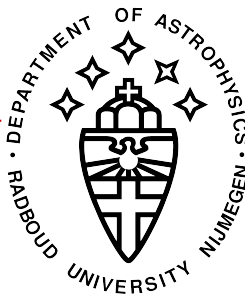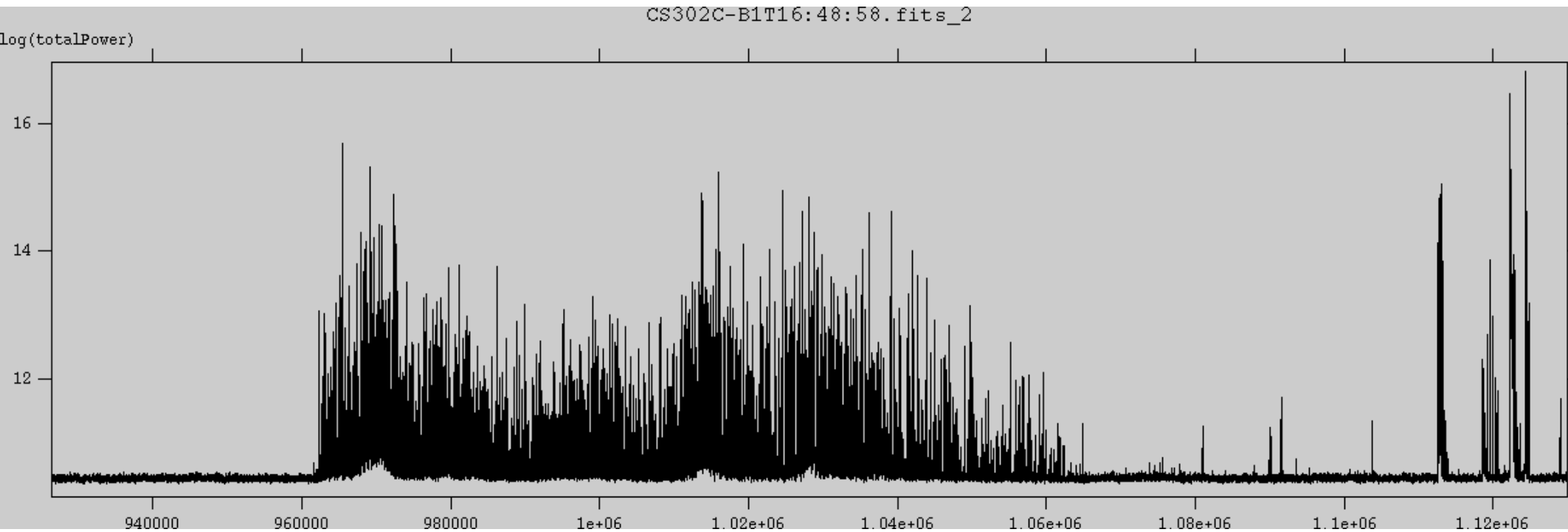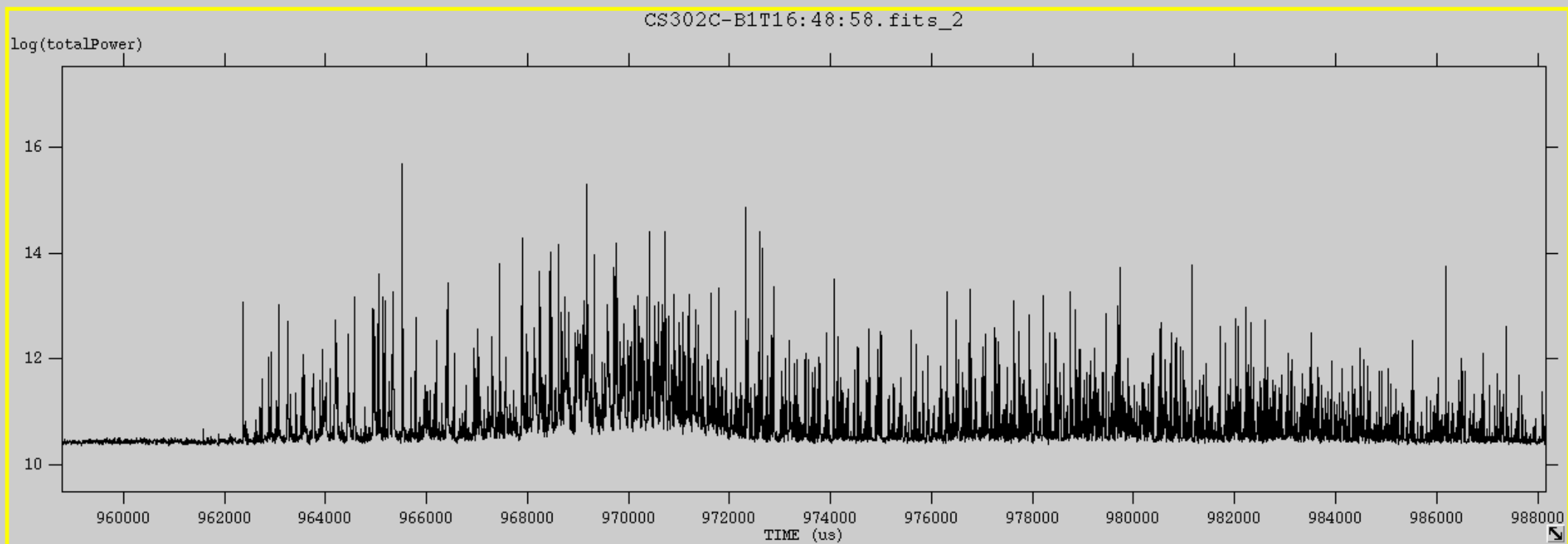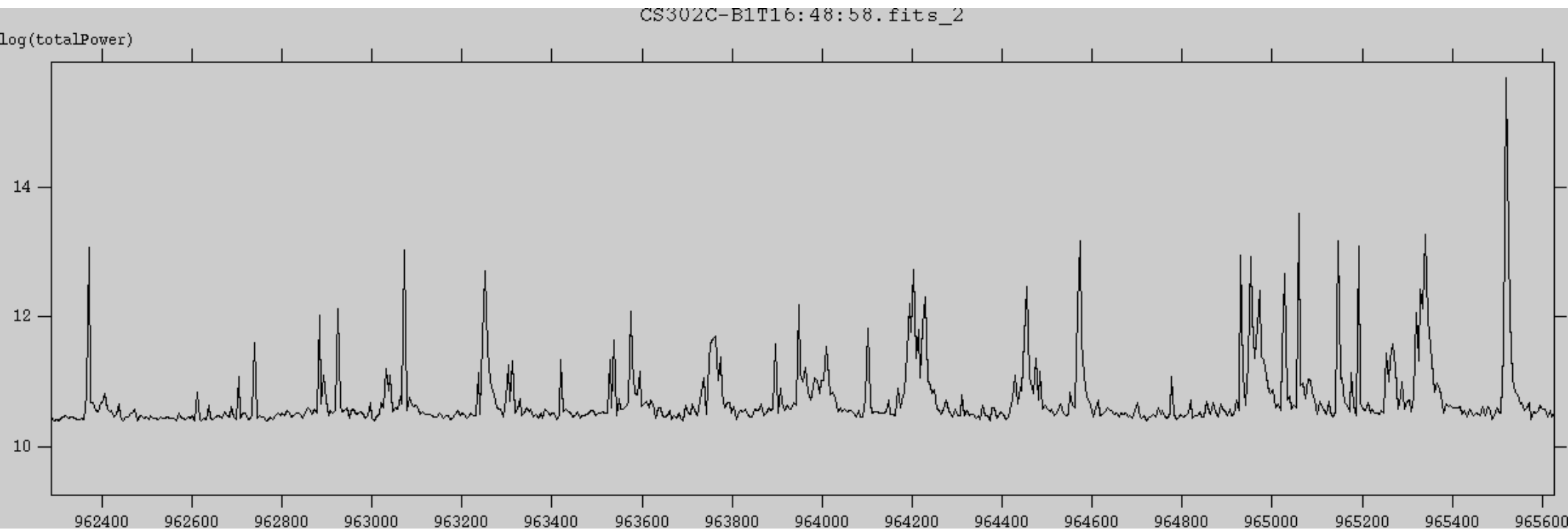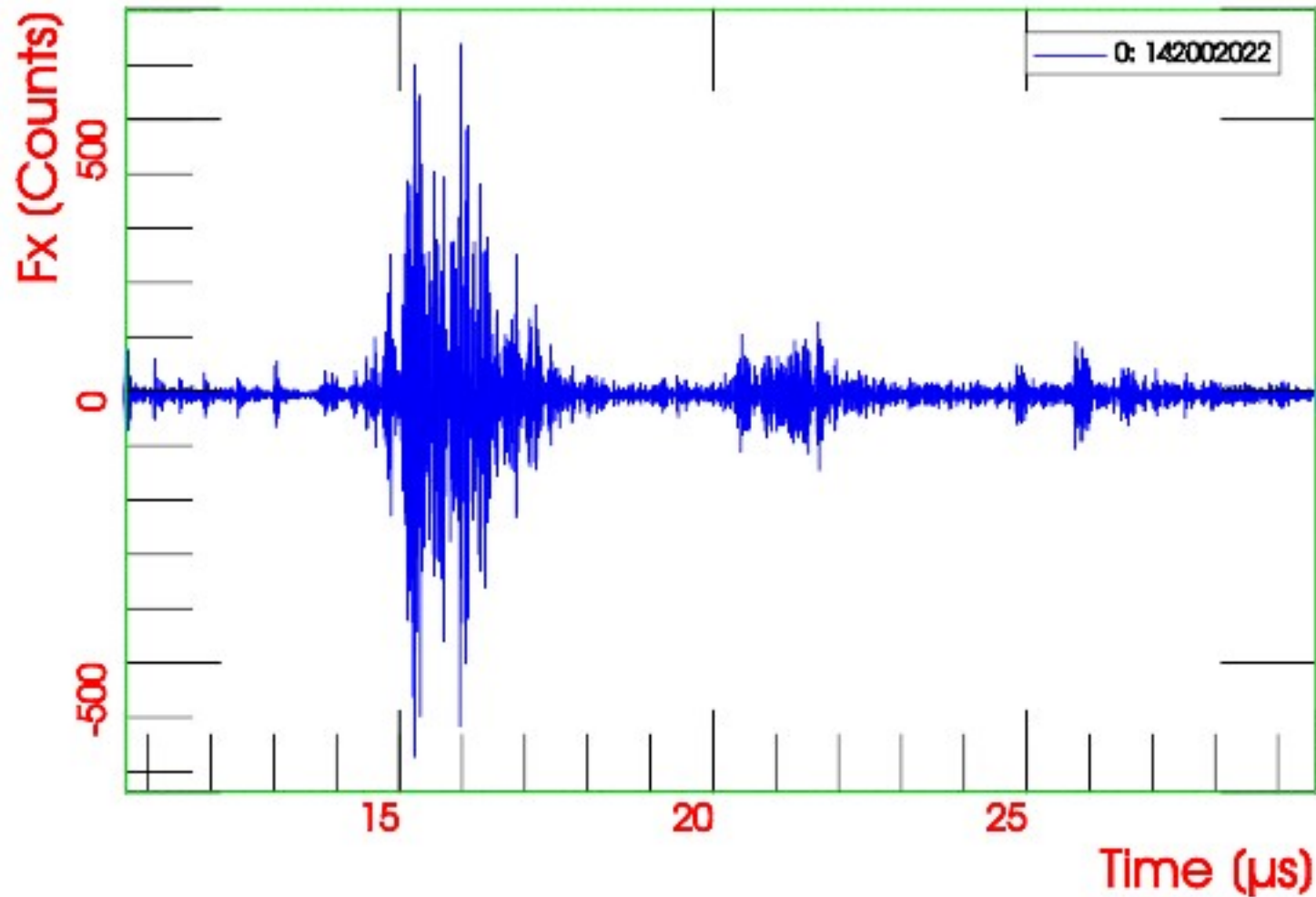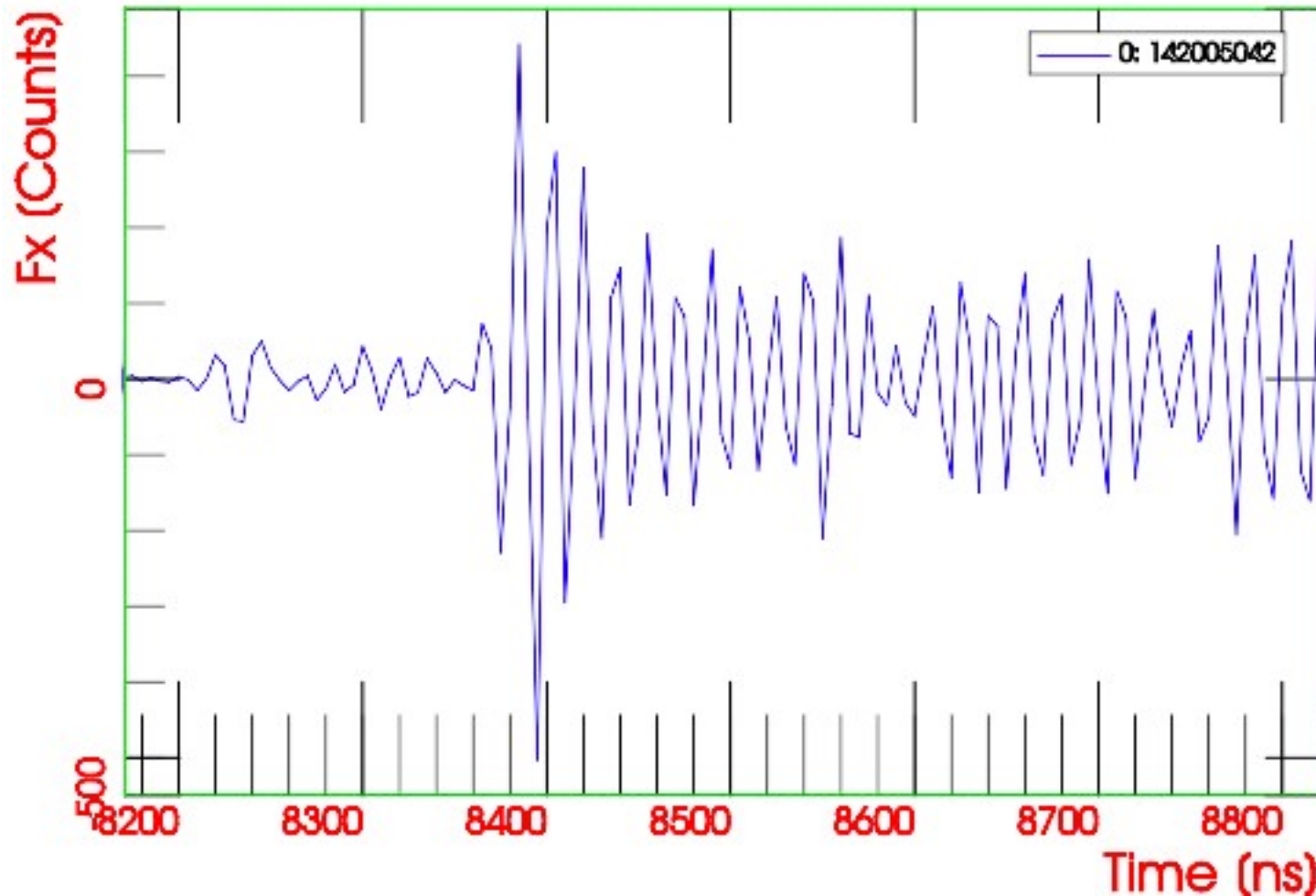
- Make DAQ more reliable
- Add more features to the dumpscript
  - Set up station
  - Allocate data only for selected dipoles
  - Dump multiple stations
- Speed and reliability tests
- Develop trigger interface to dumpscript
- Work on the VHECR-trigger