

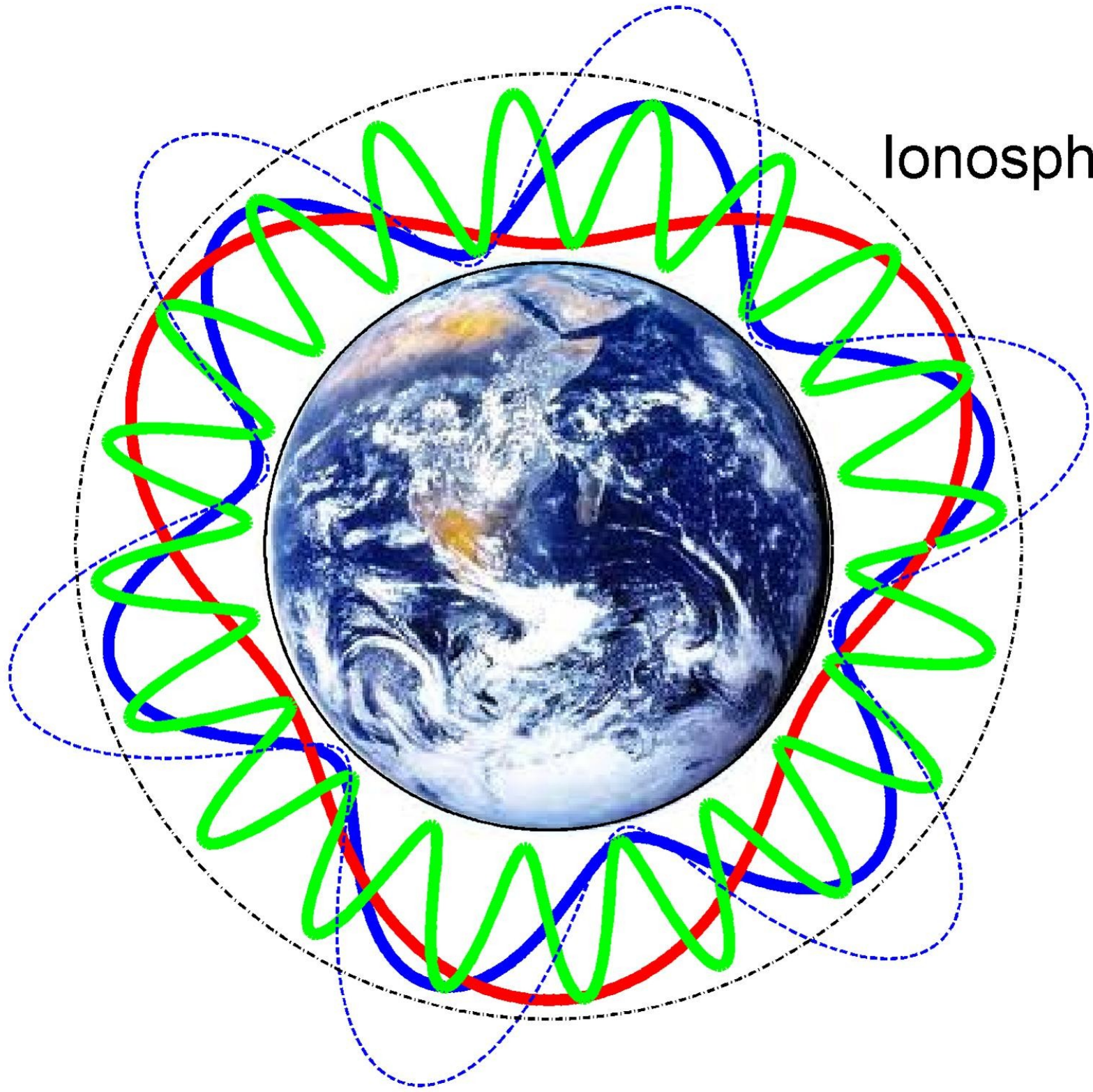
Schumann resonances in GW data

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DCC G1501114-v2

Schumann resonances

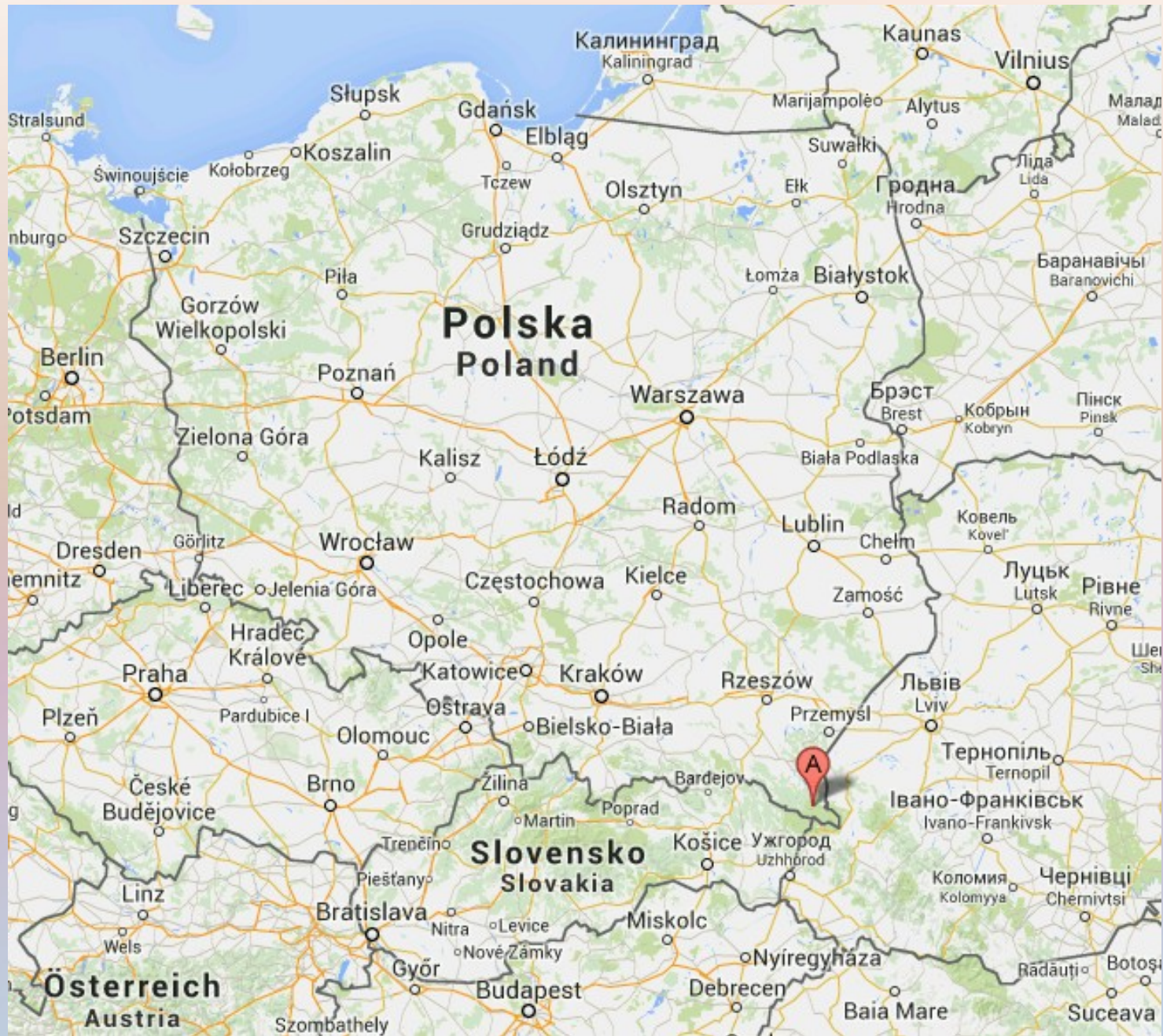
- Electromagnetic waves excited by lightning discharges
- Standing wave in Earth-ionosphere cavity
- Visible in extremely low frequency band (3-60 Hz)

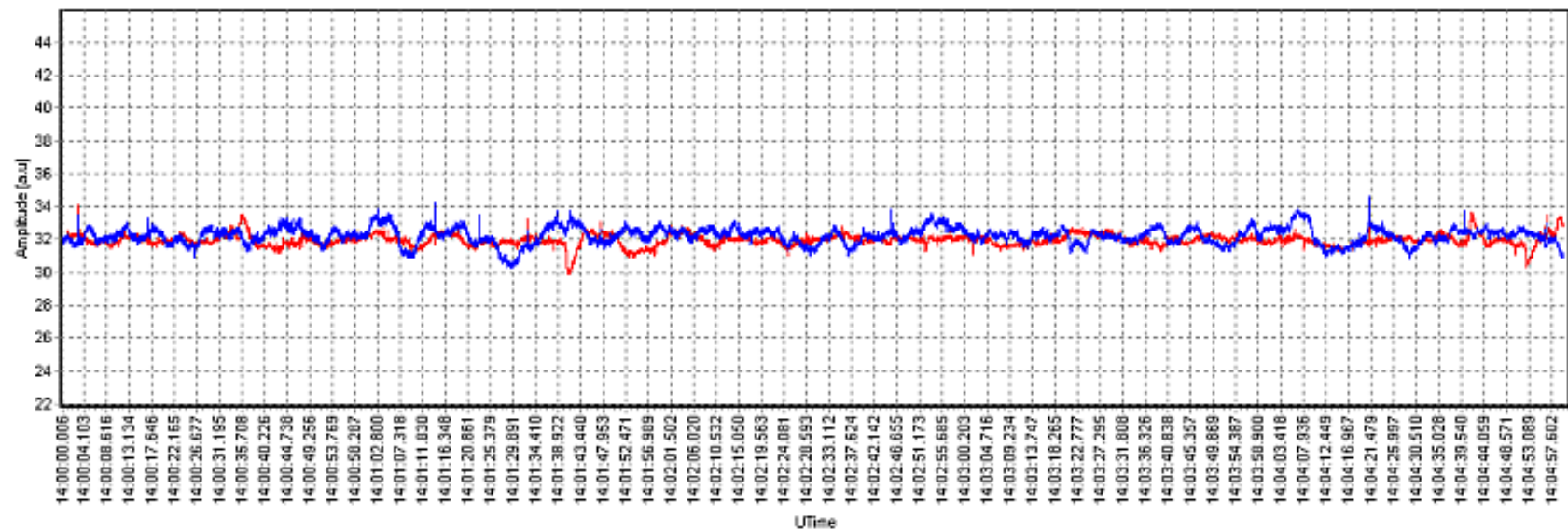
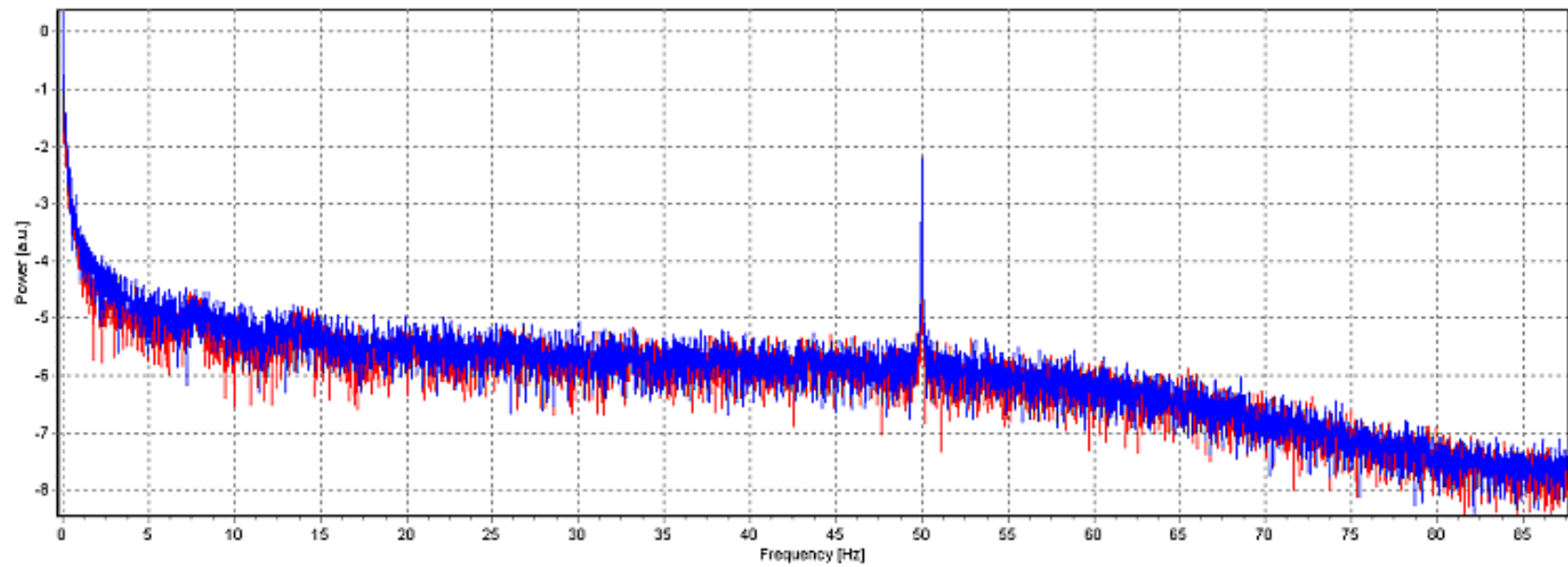


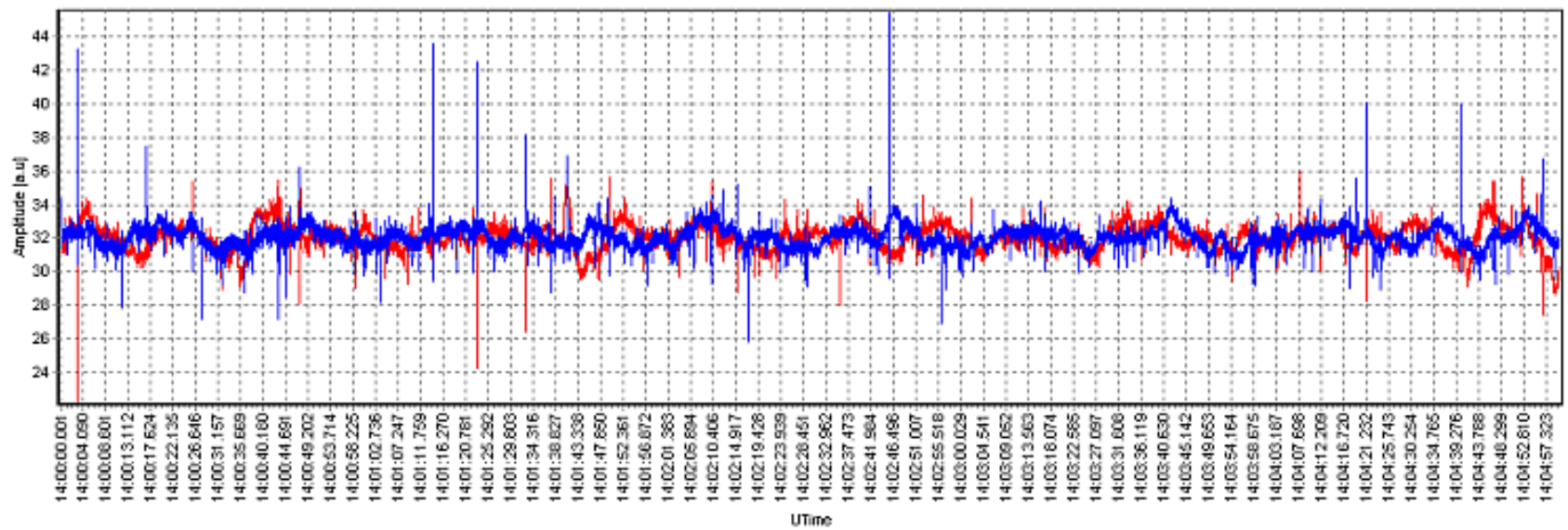
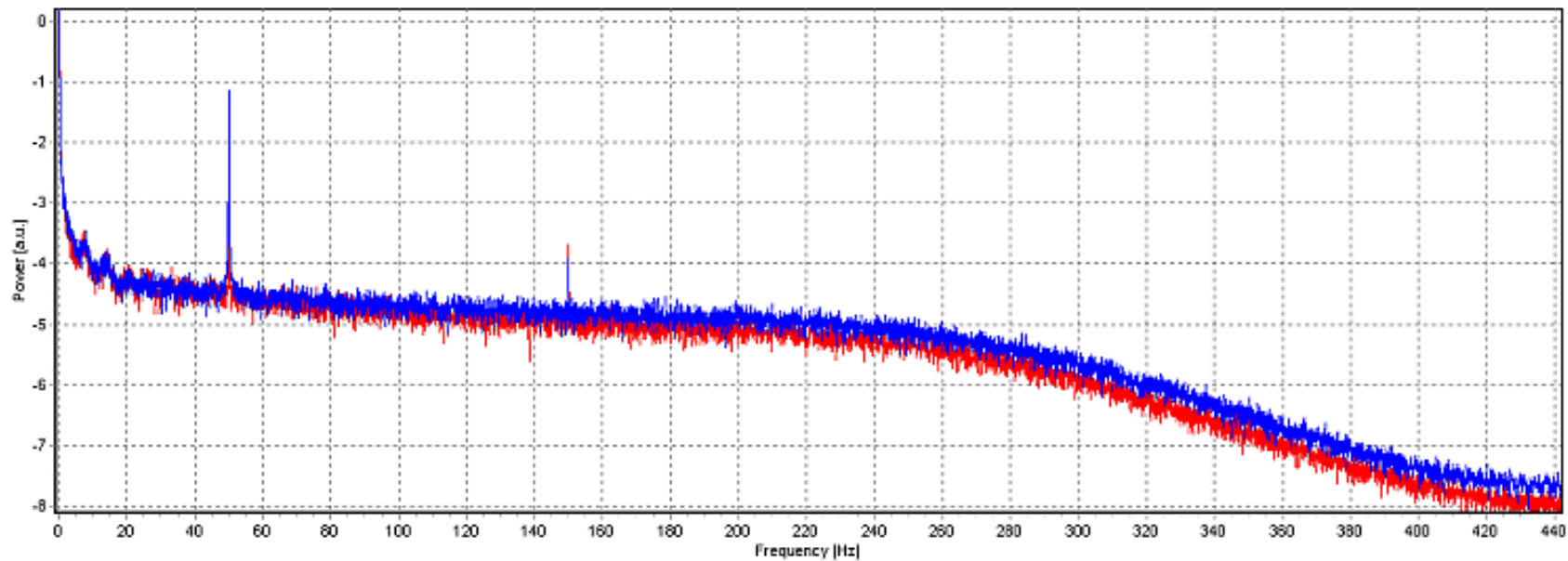
Ionosphere

ELF observations in Poland

- Three Cracow institutions - Astronomical Observatory of the Jagiellonian University (JU), Faculty of Electronics of the AGH University of Science and Technology (AGH) and Institute of Nuclear Physics of the Polish Academy of Sciences (INP).
- Hylaty station in Bieszczady
- More details → <http://www.oa.uj.edu.pl/elf/>

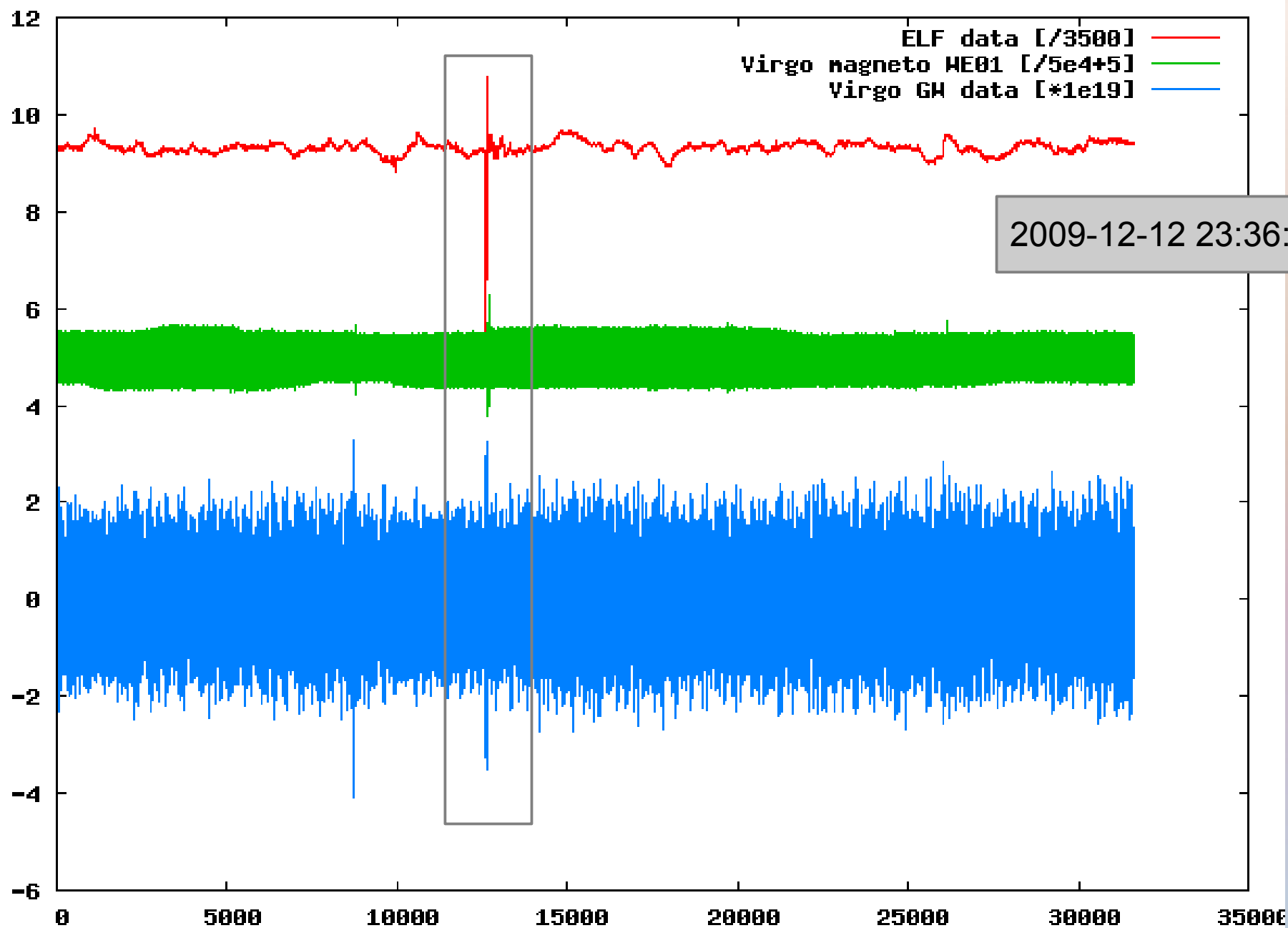


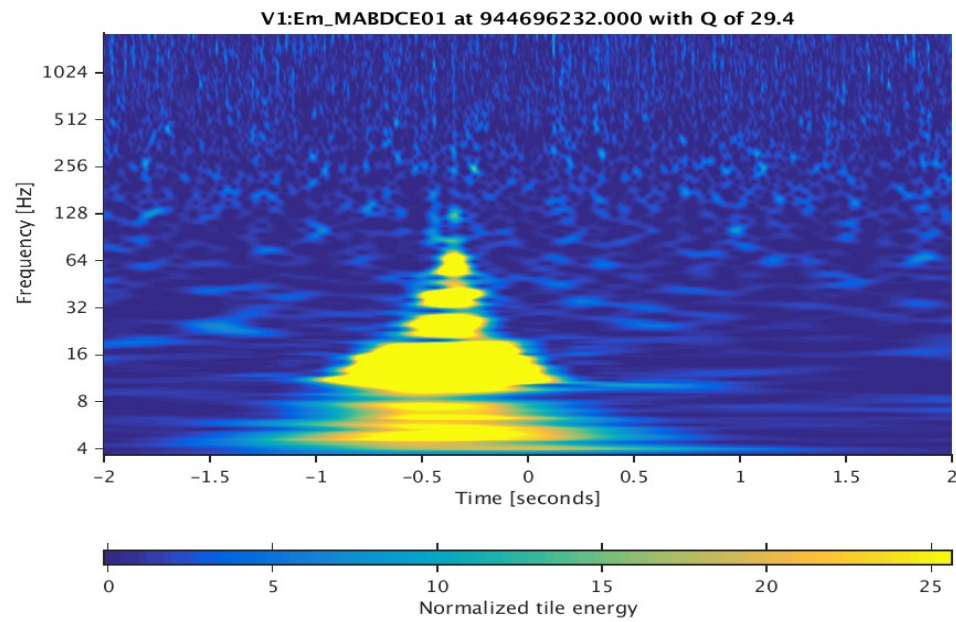
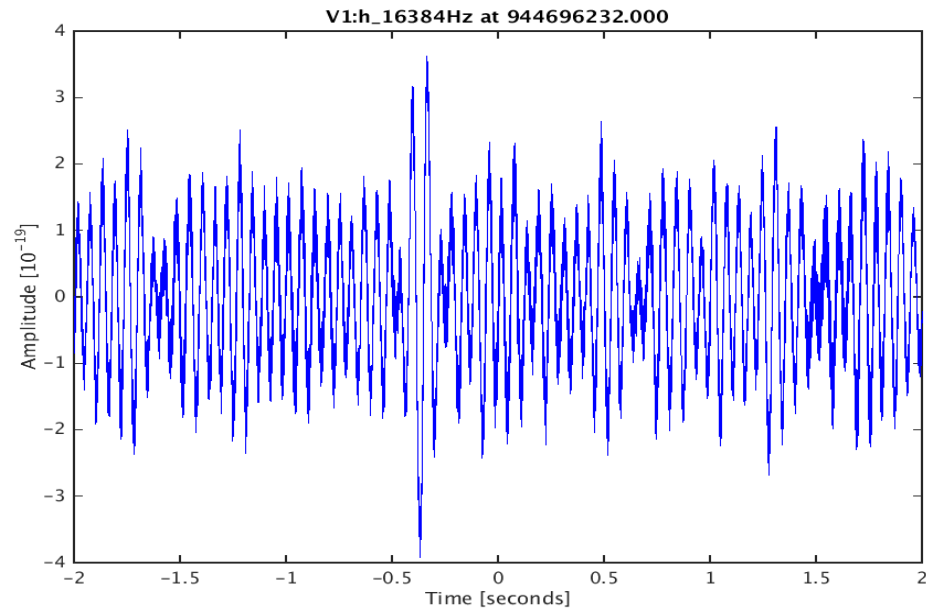




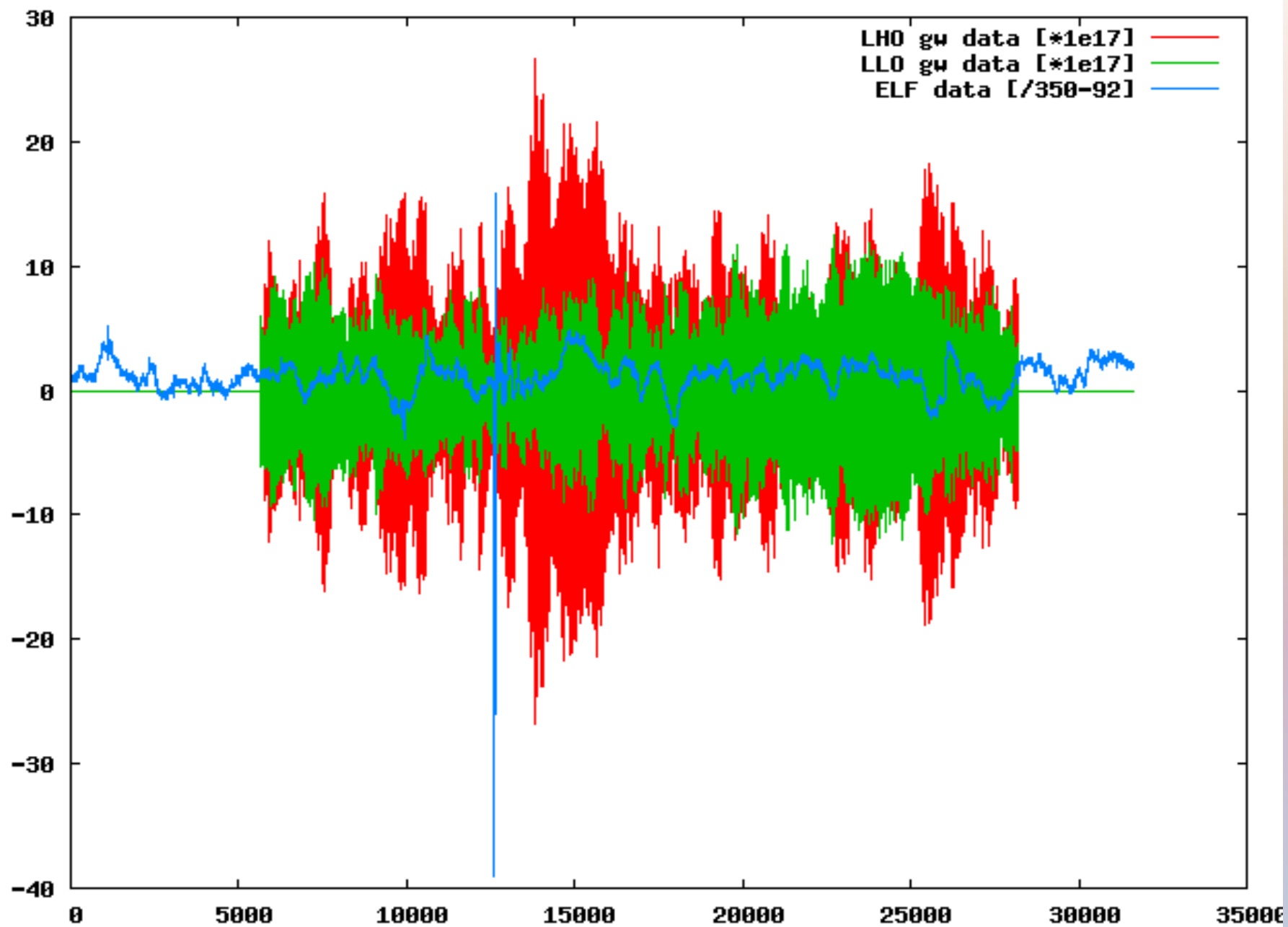
Why do We care?

- Schumann resonances are in GW detectors sensitivity windows
- Waves propagate in waveguide around the Earth – they could be seen in all detectors and create a correlated noise that may mimic a GW

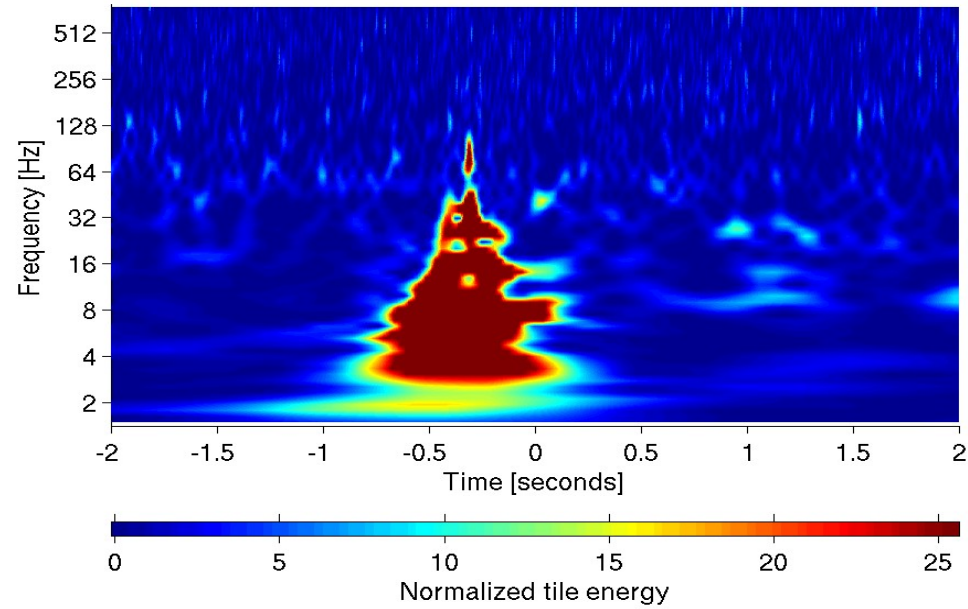




<http://virgo.in2p3.fr/WOD/V1/2009/12/12/23/944696232.000/>

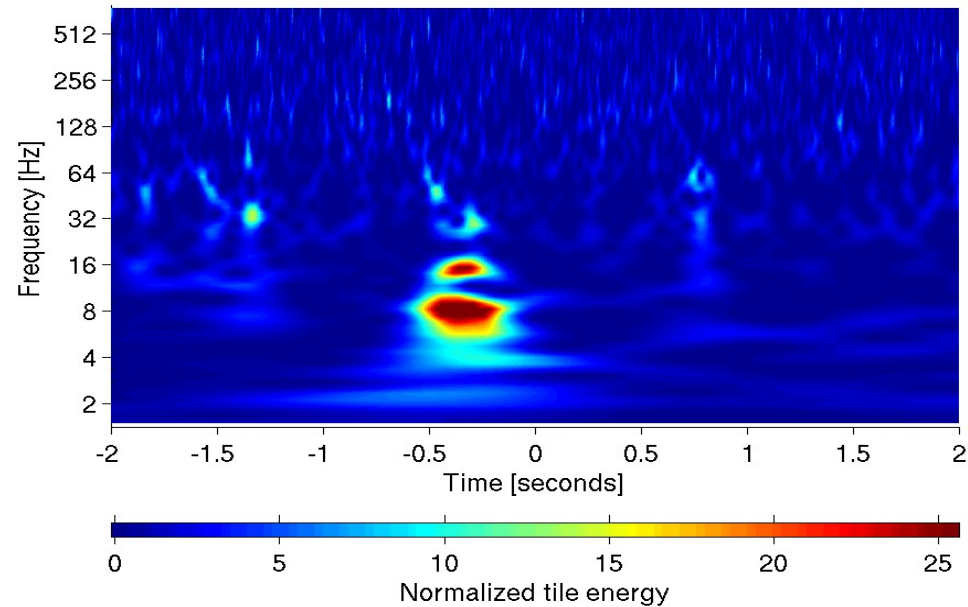


H0:PEM-BSC10_MAGZ at 944696232.000 with Q of 11.3

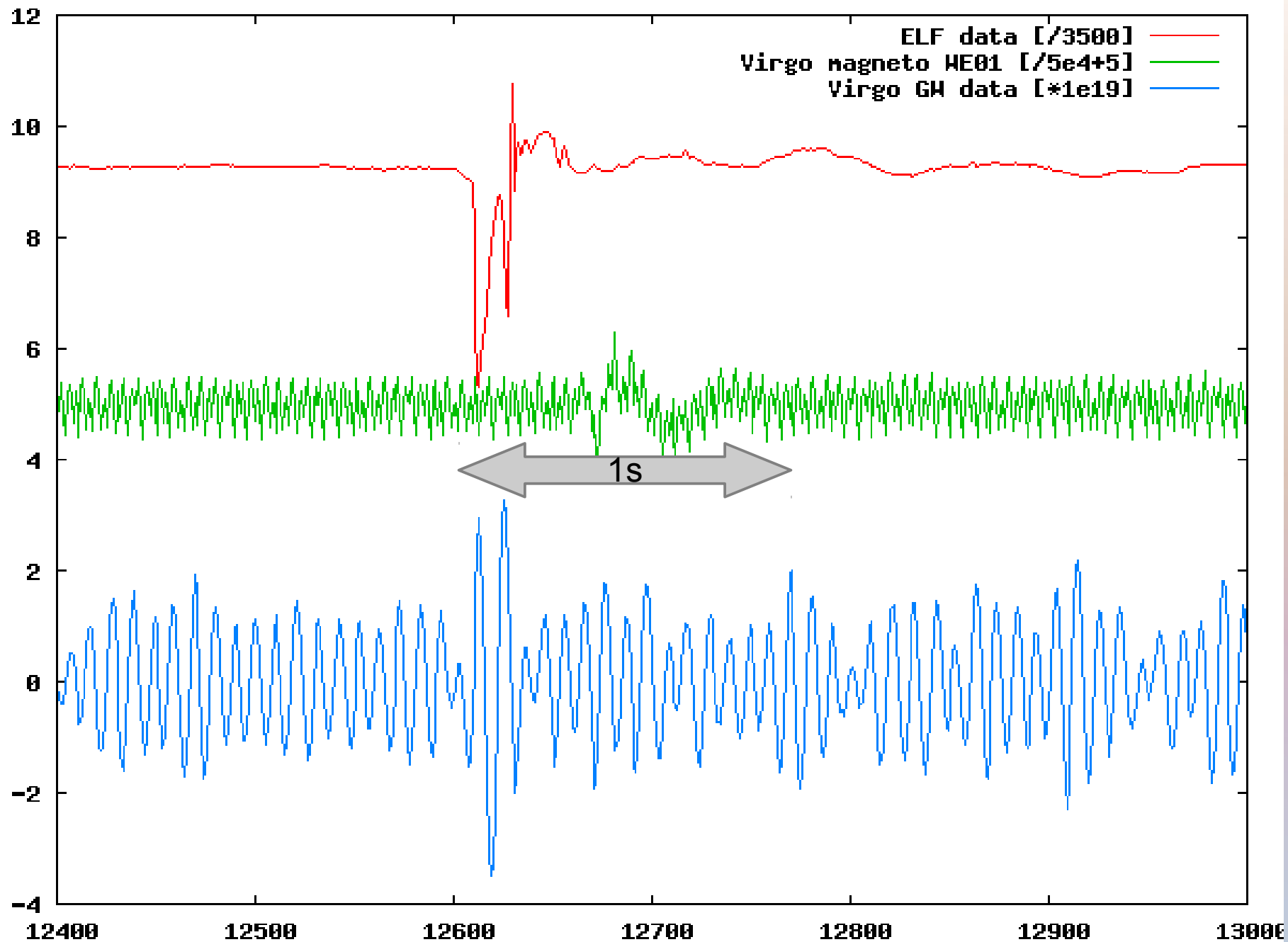


<https://ldas-jobs.ligo.caltech.edu/~nchrste/wdq/944696232H/>

L0:PEM-LVEA_MAGZ at 944696232.000 with Q of 11.3



<https://ldas-jobs.ligo.caltech.edu/~nchrste/wdq/944696232L/>



Future

- We can estimate the rate of coincident triggers seen in magnetometers placed in Virgo and LIGO → in progress
- We should check more events → in progress
- We should check if those events had produced GW triggers and how they had been vetoed (in burst searches?)
- We can try to create veto mechanism