

# Slniečná aktivita

## SID Monitor Hlohovec

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Hvezdáreň a planetárium M.R. Štefánika Hlohovec



SOHO EIT 304 Å (30,4 nm)  
(Extreme ultraviolet Imaging Telescope)

# Röntgenová erupcia

Slnčná erupcia je reakcia slnečnej atmosféry (chromosféry a koróny) na náhly, rýchly proces vyžiarovania energie, ktorý spôsobuje miestne zahriatie a urýchlenie elektrónov, protónov a ťažkých iónov.

Pod vplyvom erupcie vyžaruje koróna oblasti mäkké röntgenové žiarenie ( $\lambda > 0,1 \text{ nm}$ ). Jeho spektrum sa skladá z kontinua a emisných čiar vysoko ionizovaných atómov.

trieda	Tok, $I$ ( $\text{W}/\text{m}^2$ )
<b>B</b>	$I < 10^{-6}$
<b>C</b>	$10^{-6} \leq I < 10^{-5}$
<b>M</b>	$10^{-5} \leq I < 10^{-4}$
<b>X</b>	$I \geq 10^{-4}$

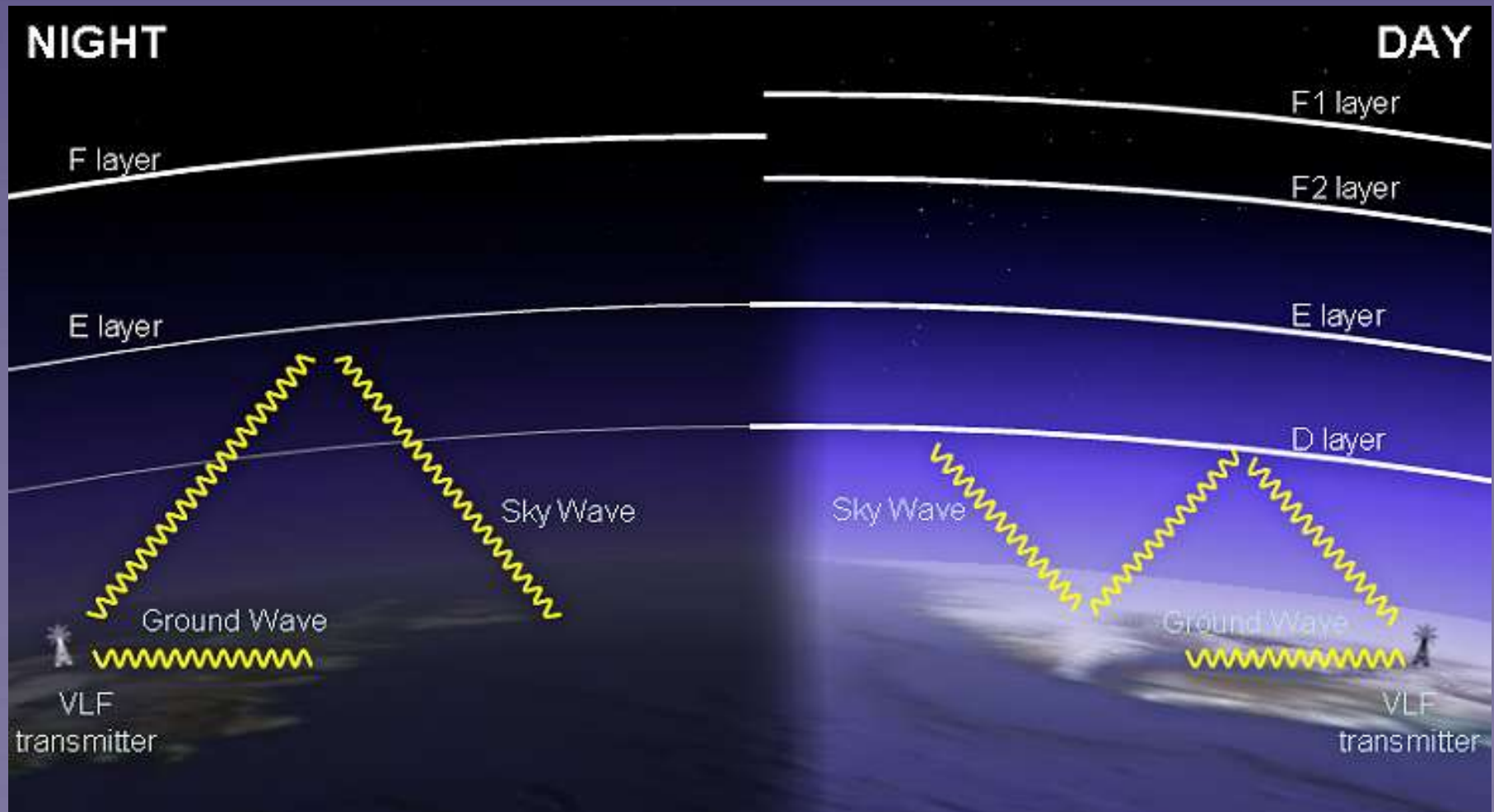
Presný údaj o mohutnosti dostaneme:

$$C7 = 7 \cdot 10^{-6} \text{ W}/\text{m}^2$$

alebo

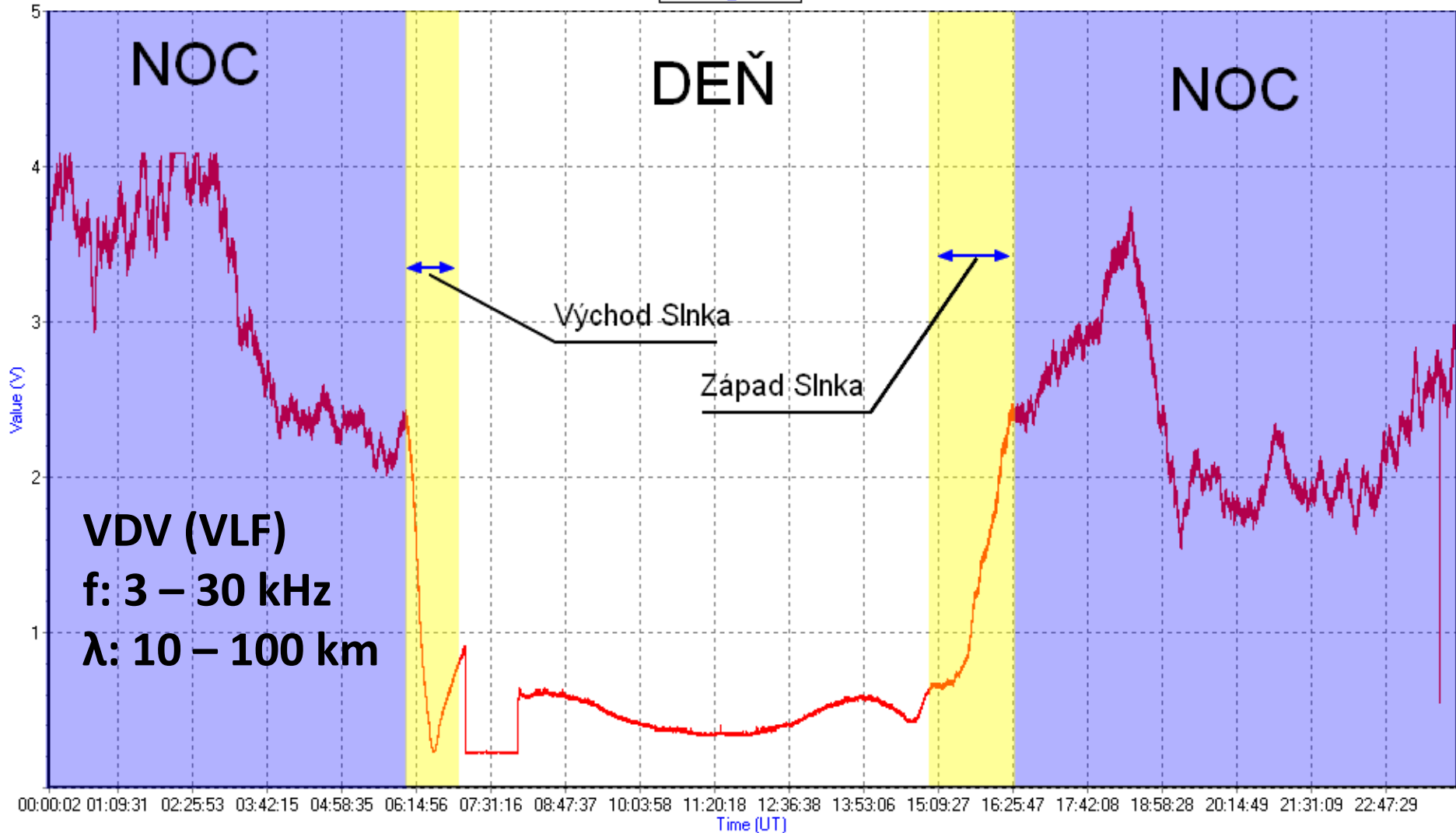
$$X4 = 4 \cdot 10^{-4} \text{ W}/\text{m}^2$$

# Ionosféra (60 – 600 km)



# Priebeh intenzity signálu za 24 hodín

File: Ch1\_0116.txt



# Náhla ionosférická porucha (SID)

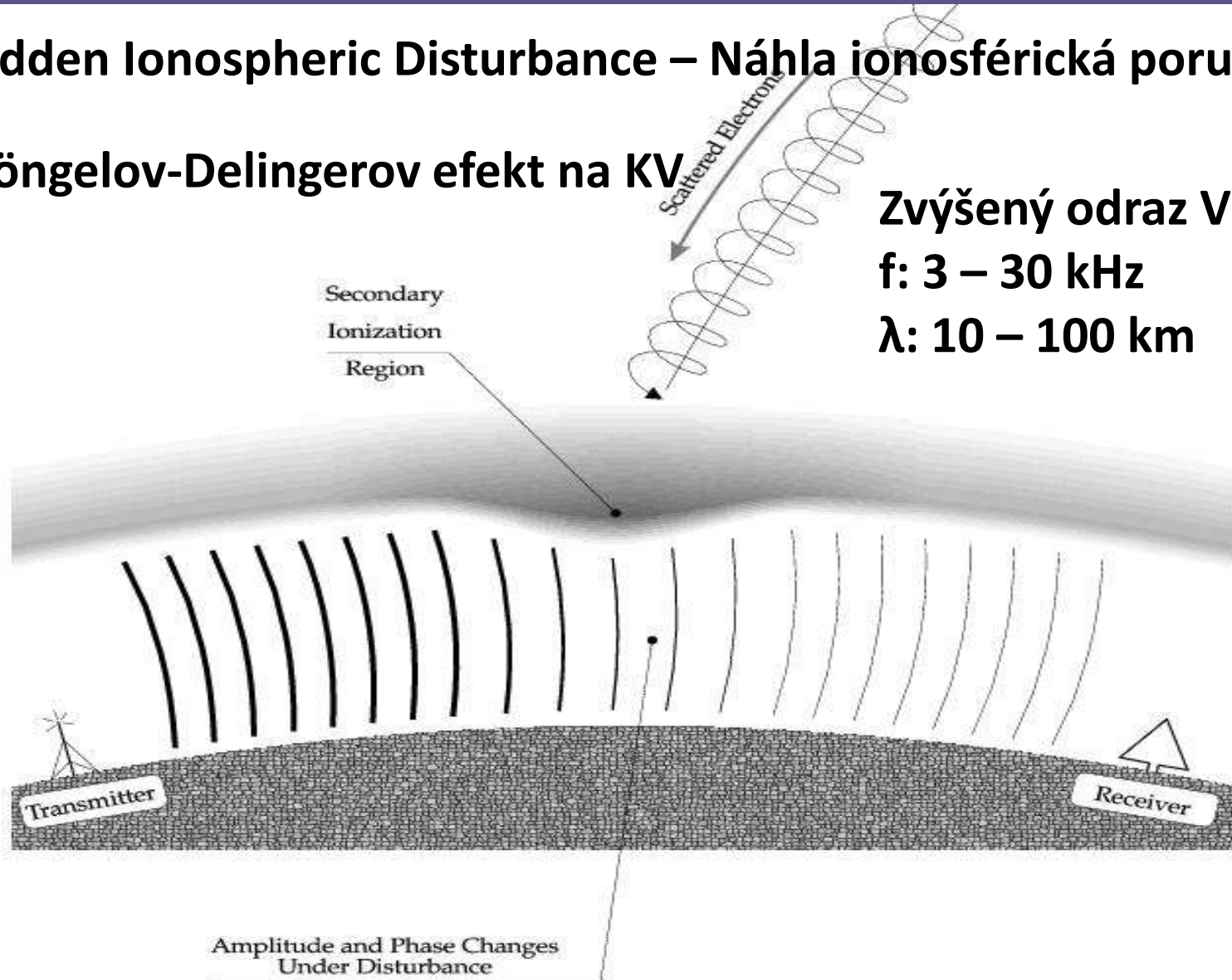
Sudden Ionospheric Disturbance – Náhla ionosférická porucha

Möngelov-Delingerov efekt na KV

Zvýšený odraz VDV (VLF)

$f$ : 3 – 30 kHz

$\lambda$ : 10 – 100 km



# SID Monitor

Podľa Stanford University Solar Center

<http://solar-center.stanford.edu/SID/sidmonitor/>

Autori zapojenia:

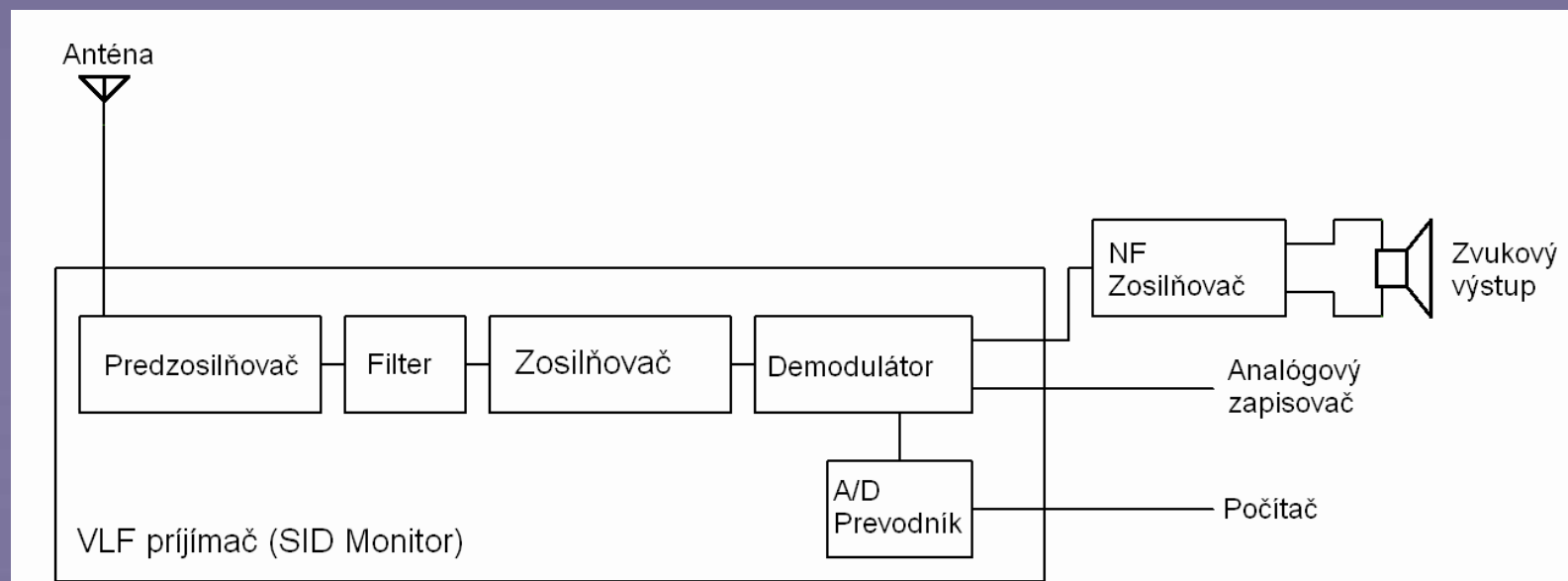
Ray Mitchell

Bill Clark

Napájanie: ~9 V

Aktívny filter s IO MAX275

## Bloková schéma



## SID Monitor

Stanica: HaP Hlohovec

Kanály:

DHO38            23,40 kHz

GQD              22,10 kHz

ICV               20,27 kHz

Antény:

Slučkové

E-W    štvorcová        2x2m    26 závitov

N-S    štvorcová        3x2m    10 závitov









# VLF vysílače v Európe

Vysielač

frekv.

Výkon

DHO38

23,40 kHz

500 kW

GQD

22,10 kHz

500 kW

ICV

20,27 kHz

43 kW



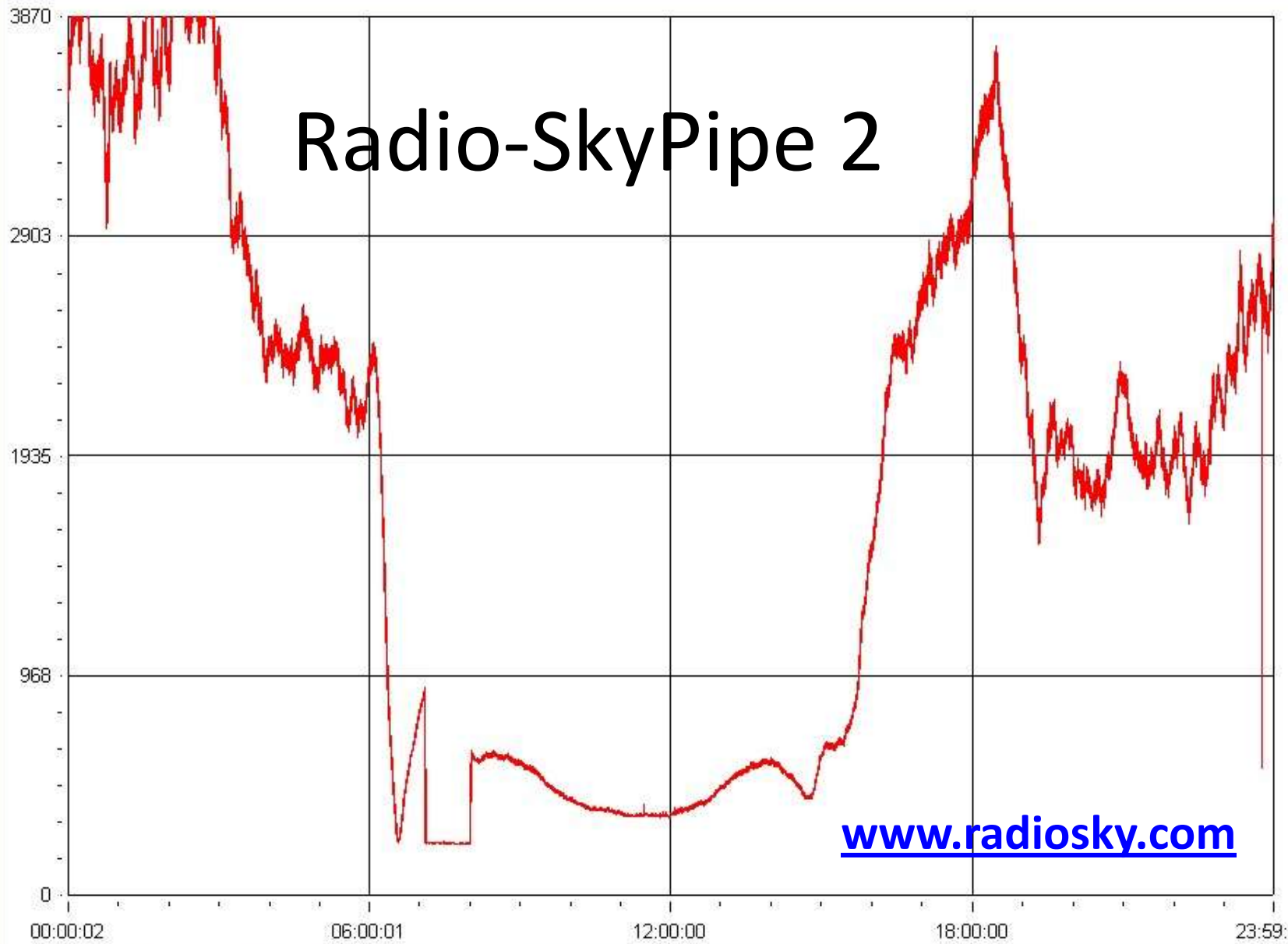
© 2009 Europa Technologies  
US Dept of State Geographer  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
© 2009 Tele Atlas

©2009 Google

47°50'56.14" S 15°26'56.58" V výš. 515 m

Výška pohľadu 3984.44 km

Start Chart



[www.radiosky.com](http://www.radiosky.com)



# Real time SID Monitor data from Hlohovec



Station: HaP Hlohovec

Latitude: 48° 25' 11" N Longitude: 17° 47' 54" E

Sun, 07 Mar 2010 10:43:24 GMT

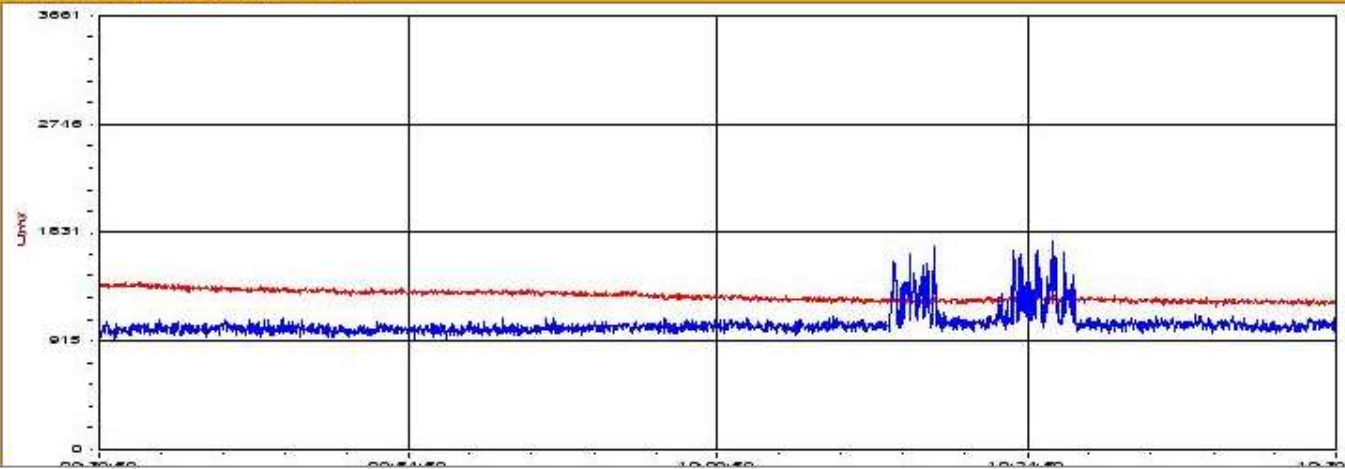
Next Chart at Sun, 07 Mar 2010 10:50:01 GMT

The most recent chart:

Starts 03.07.2010 09:40:00 UT

Ends 03.07.2010 10:40:00 UT

<http://www.karlovsky.info/sid/temphtml.htm>



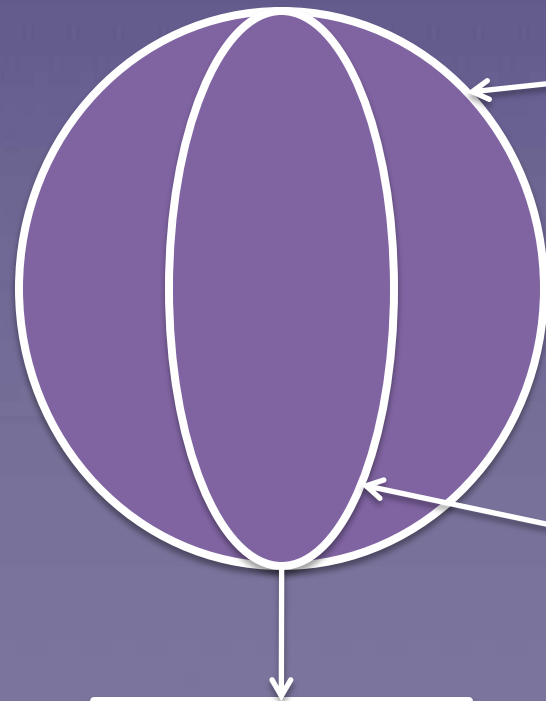
DHO38 (23,4kHz)

---

ICV (20,27kHz)

---

# Super\_SID



Anténa N-S

Zvuková karta  
M-AUDIO Transit  
so vzorkovacou  
frekvenciou 96 kHz

Anténa E-W

Viac-kanálový  
príjem pomocou  
jedného zariadenia

Predzosilňovač  
podľa klasického  
SID monitora s  
precíznymi OZ  
OPA 2604 AP

Dvojčinný  
predzosilňovač

Zvuková karta  
počítača

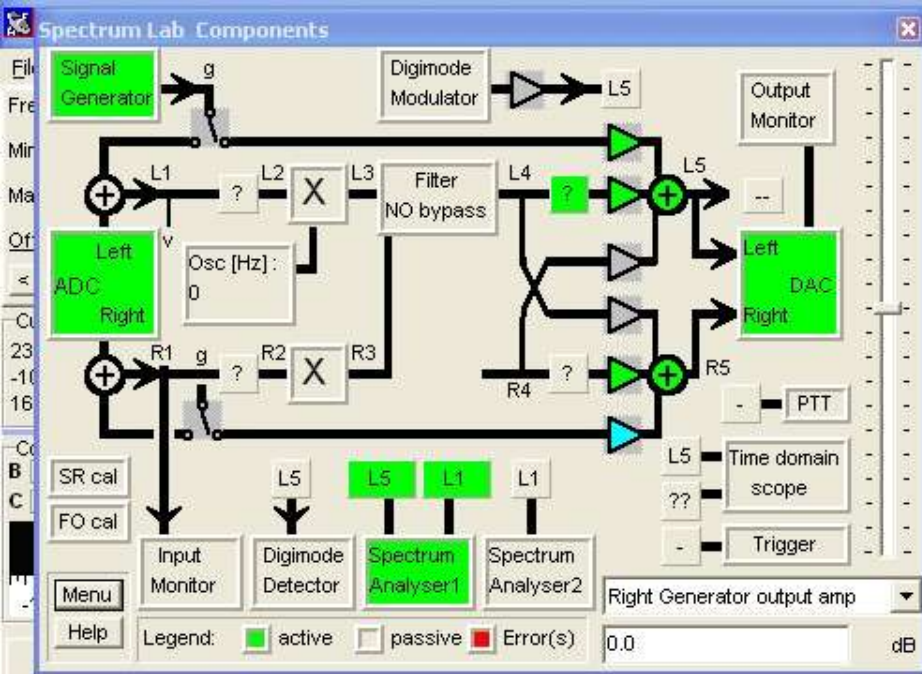
SpectrumLab



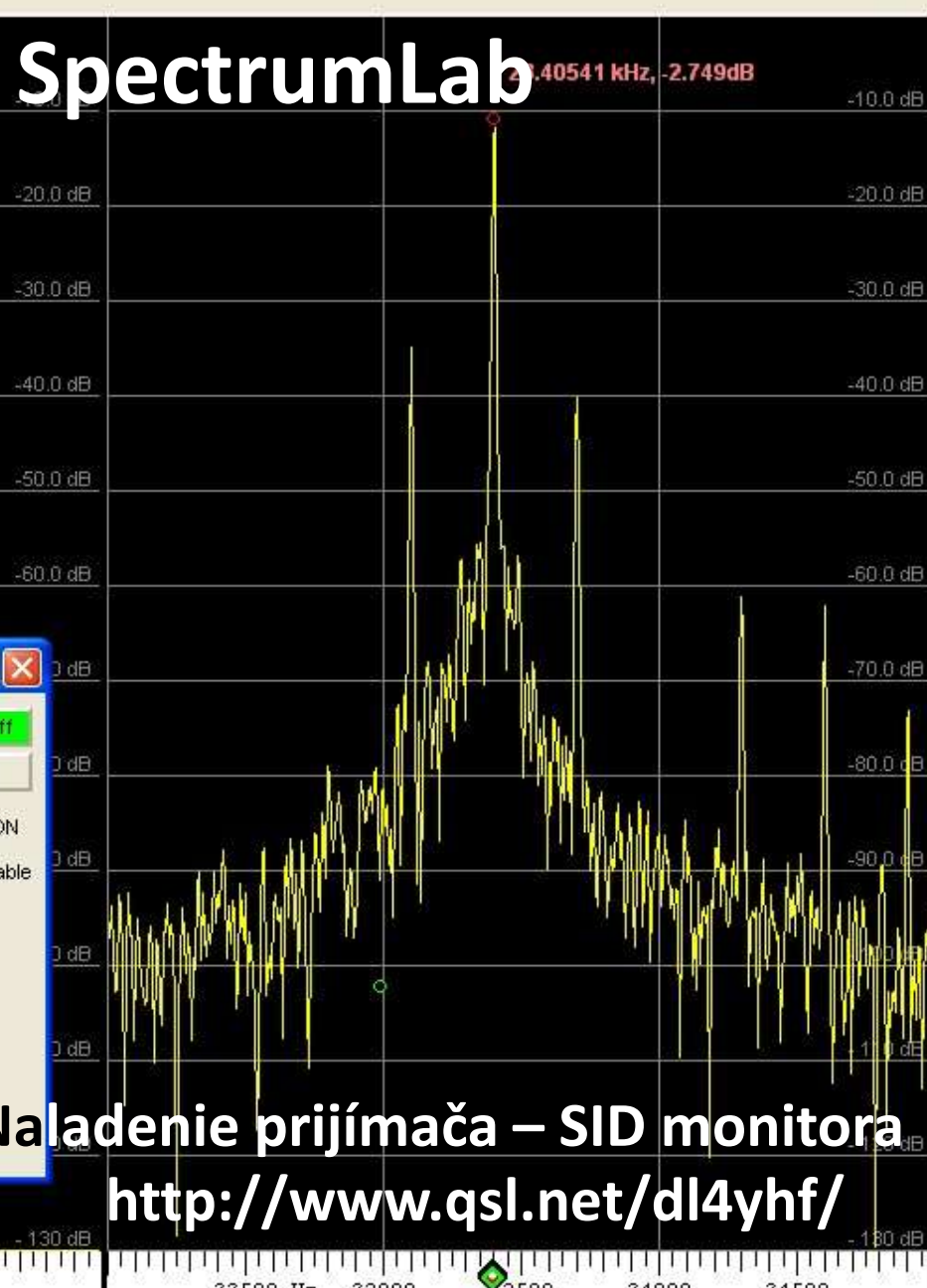








# SpectrumLab



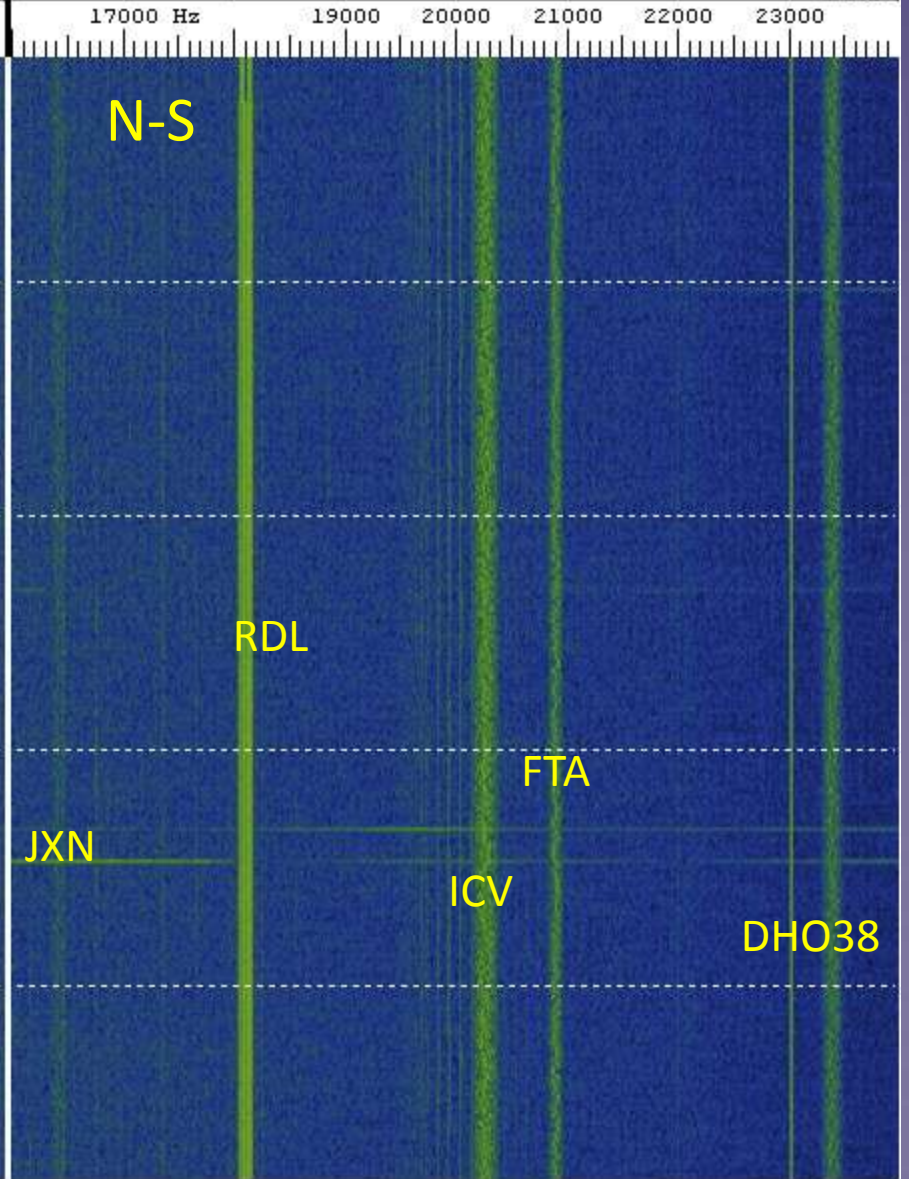
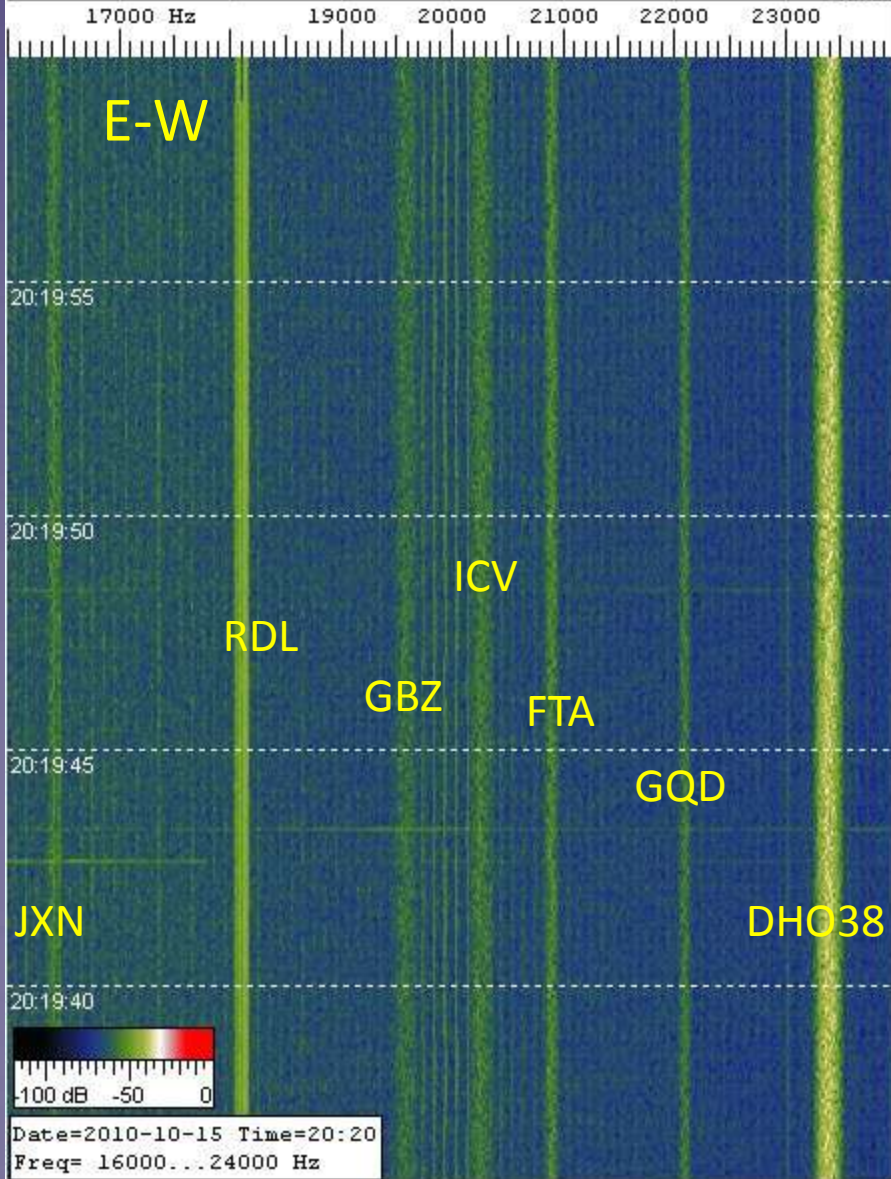
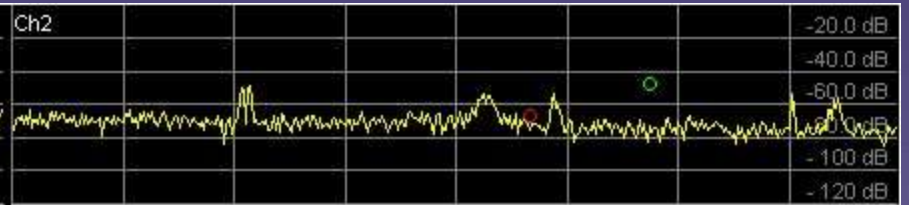
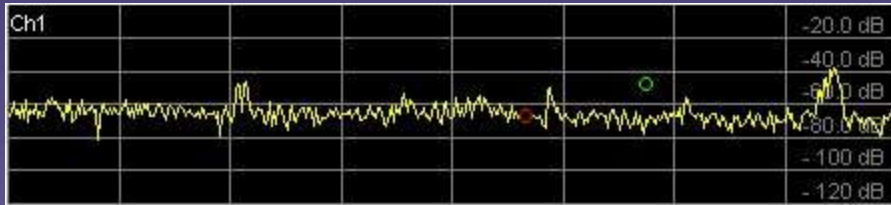
The 'Test Tone Generators' window provides settings for various signal generators and modulators. It includes tabs for 'Generators and Modulators', 'Arbitrary Waveform Editor', and 'Options'. The 'Function Generators' section shows three sine wave generators with the following settings:

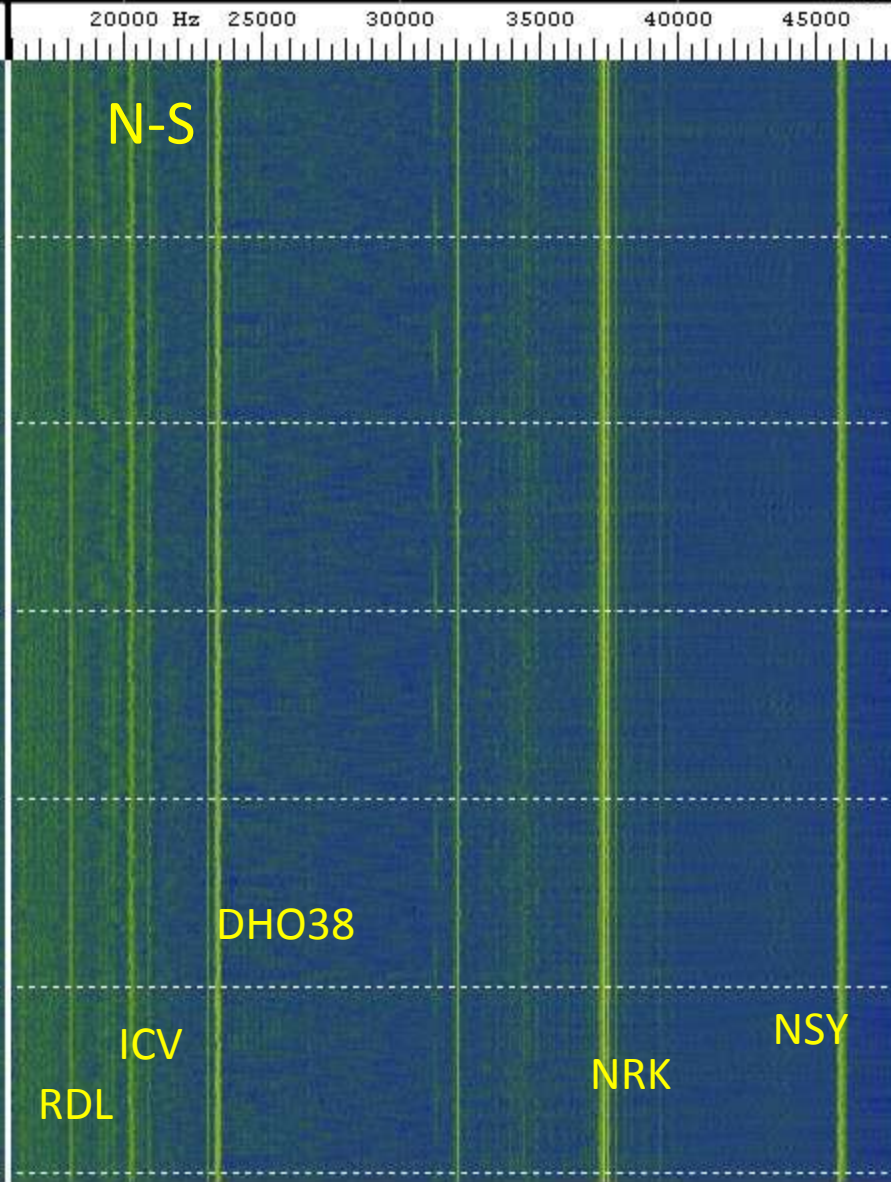
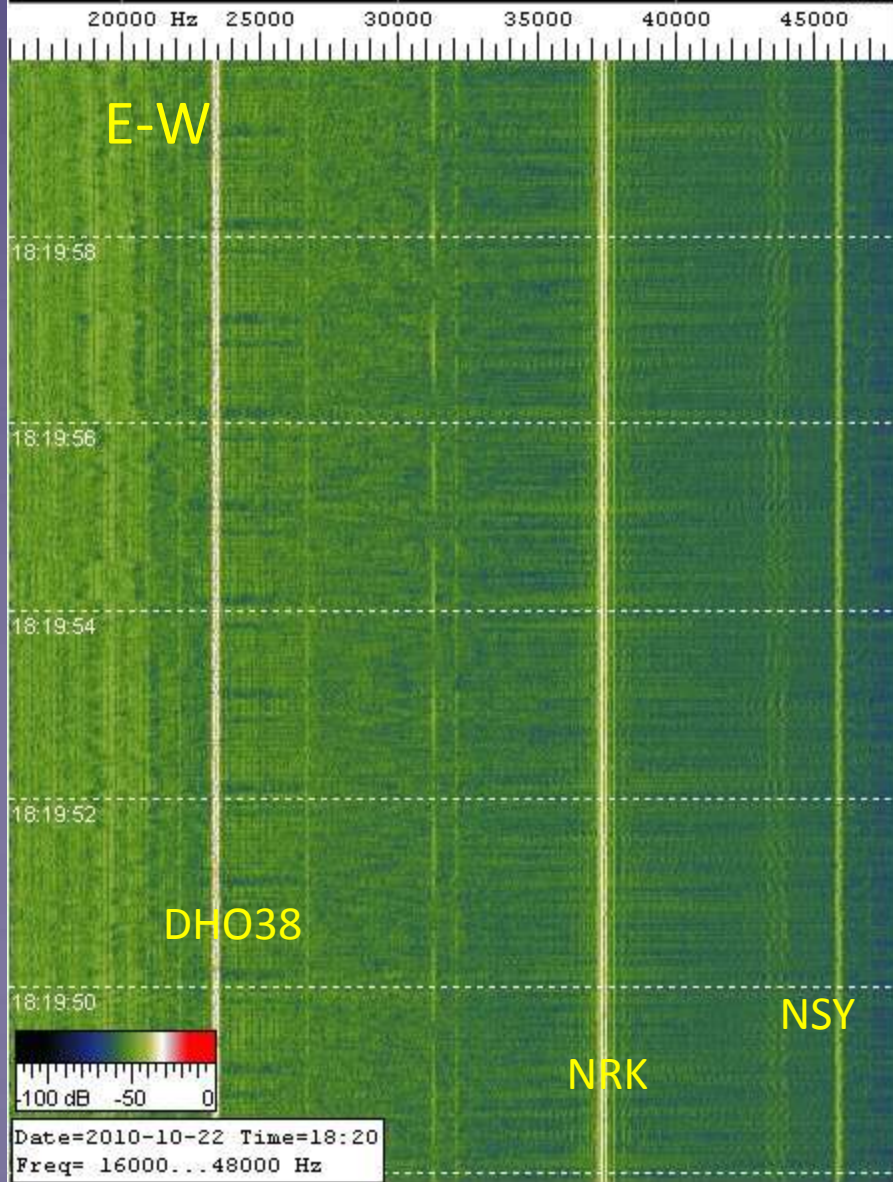
On	AM	FM	Waveform	Freq/Hz	Level (0dB=max)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	sine	23400	-20 dB
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	sine	23400	-70 dB
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	sine	31500	-10 dB

The 'Noise Generator' section is currently off, with a level of -50 dB / sqrt(Hz). The 'Amplitude Modulator' section is set to a frequency of 300 Hz, a factor of 1, a carrier of 1, a sine waveform, and a 75% duty cycle. The 'Frequency Modulator' section is set to a frequency of 100 Hz, a deviation of 240.5 Hz, a sine waveform, and a 50% duty cycle.

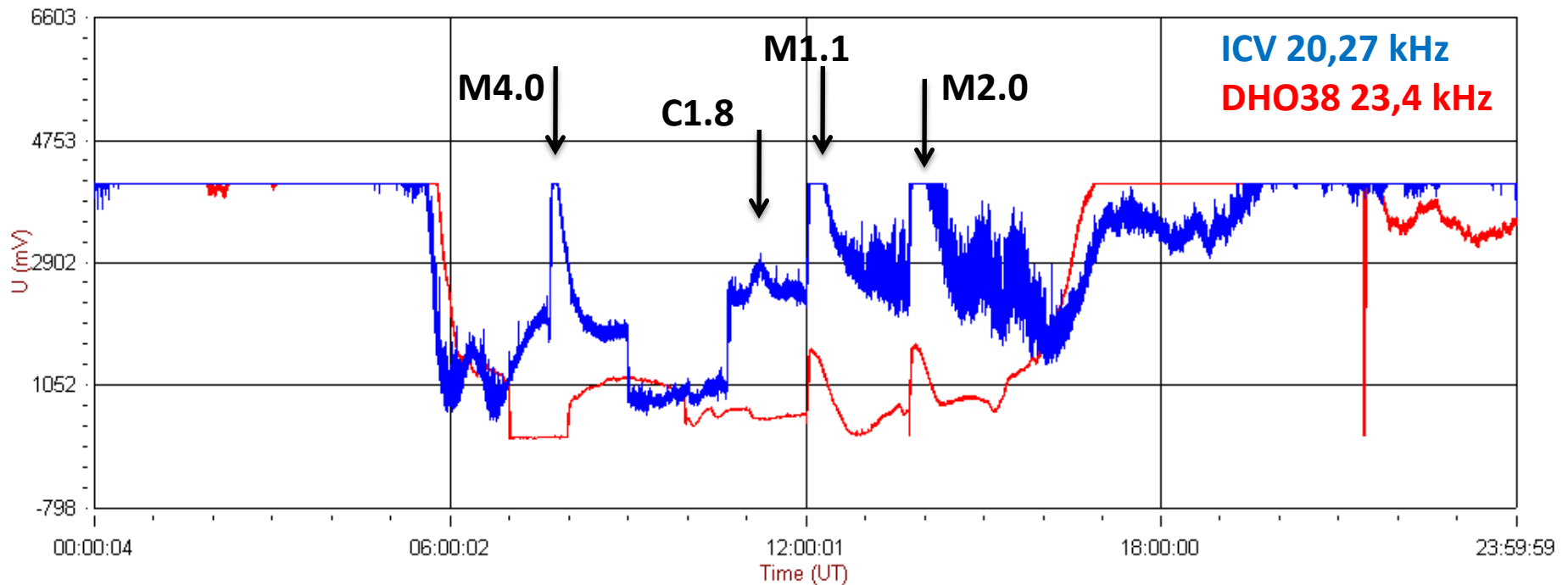
Naladenie prijímača – SID monitora

<http://www.qsl.net/dl4yhf/>





# Zachytené erupcie

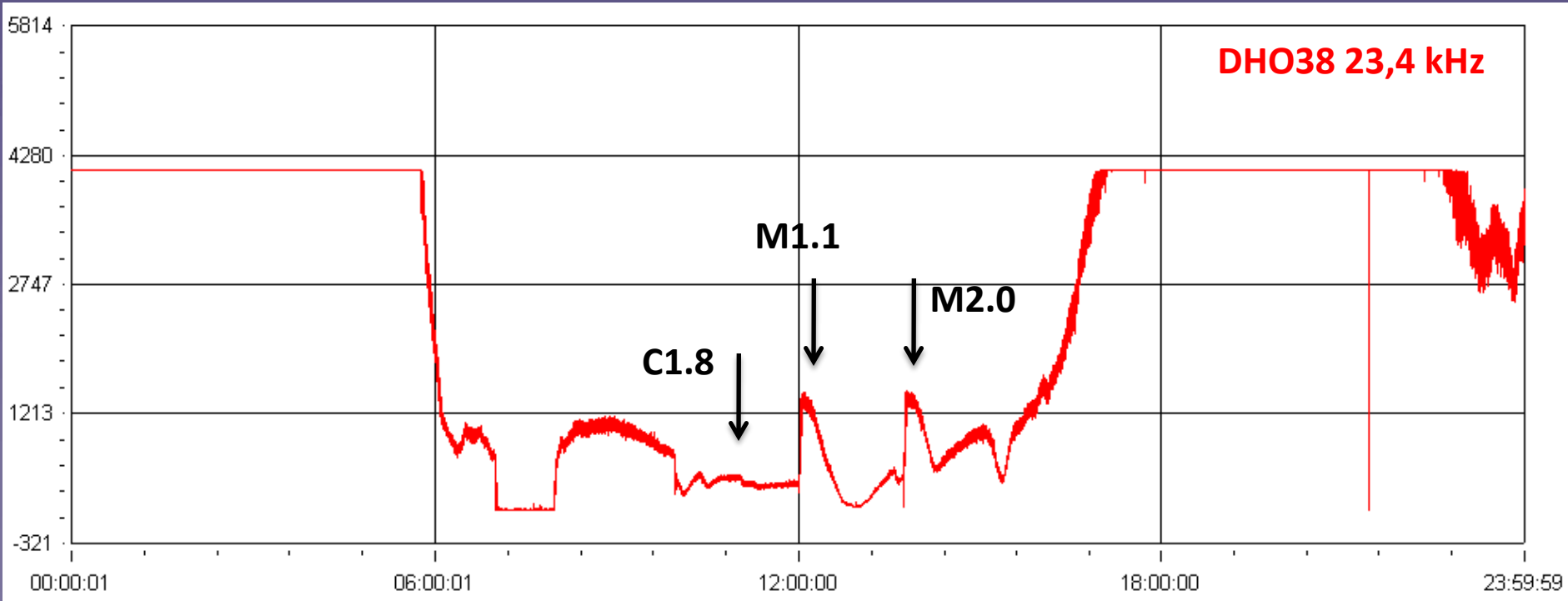


HaP Hlohovec

8.2.2010

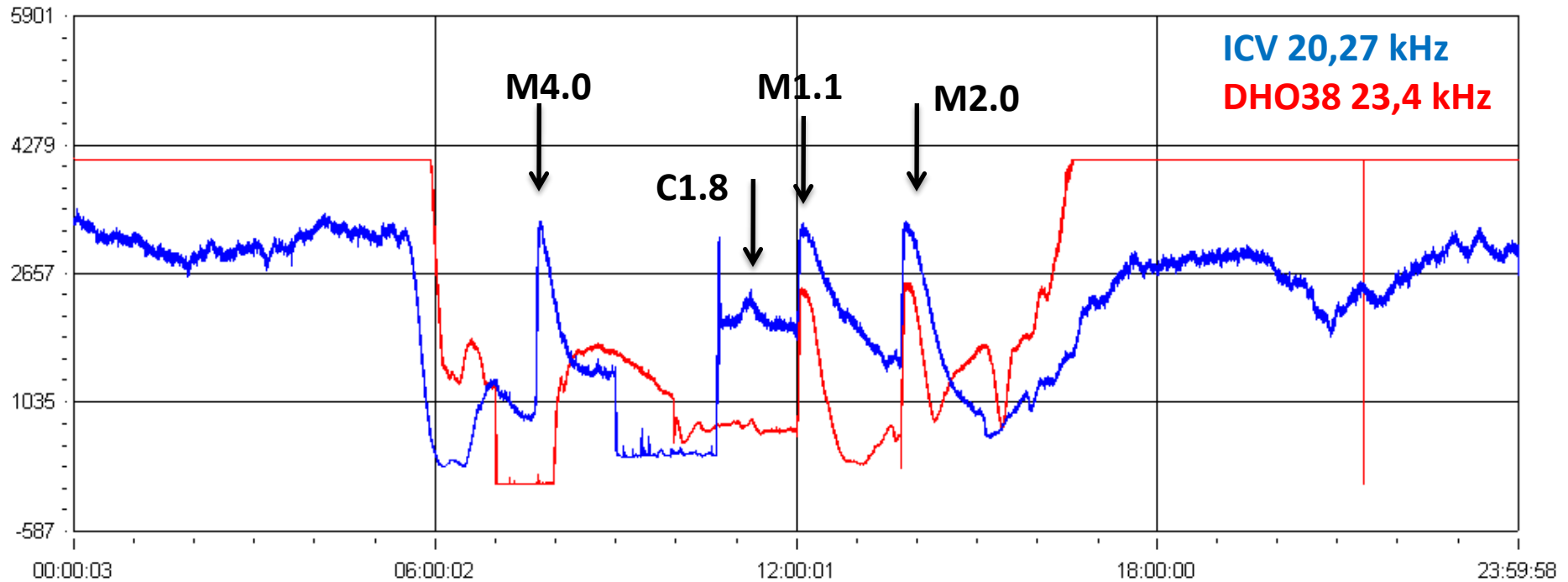
M4.0, C1.8, M1.1, M2.0

NOAA 11045

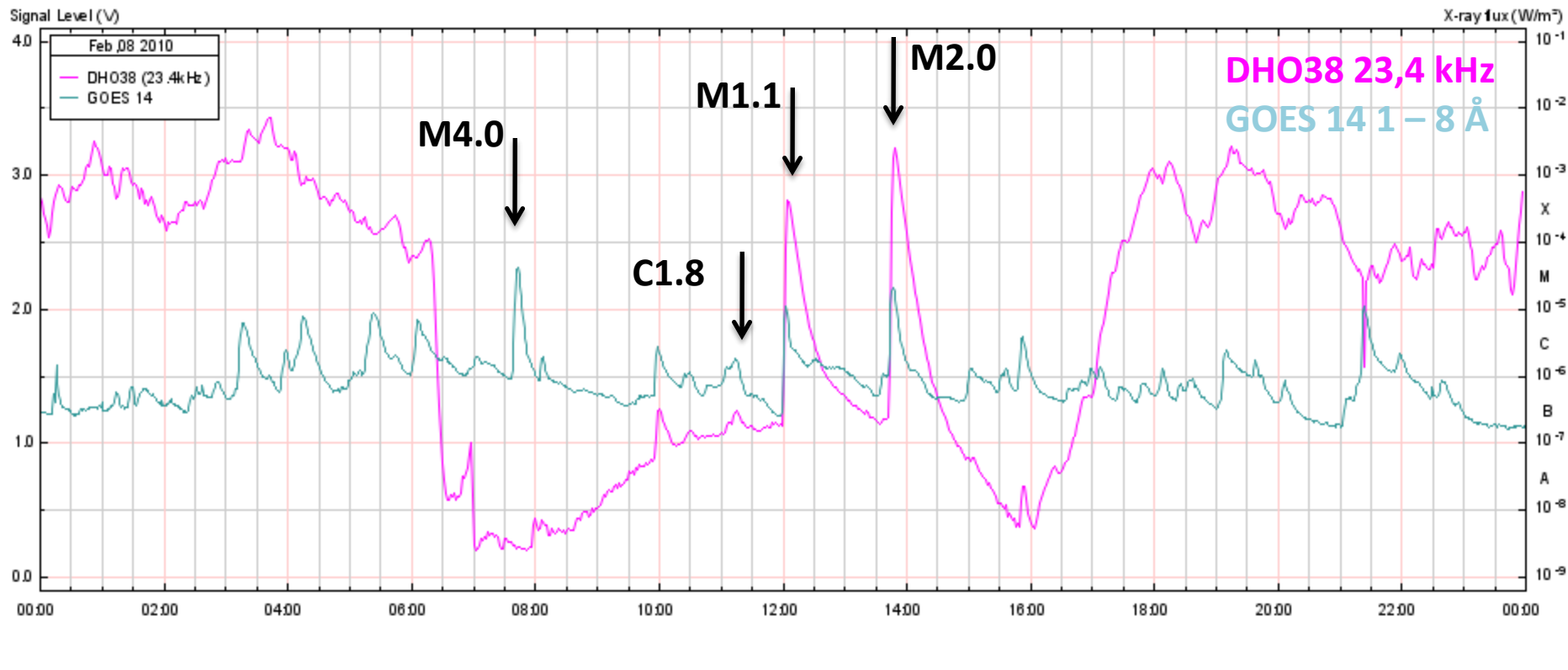


Hvezdáreň v Partizánskom  
8.2.2010  
M4.0, C1.8, M1.1, M2.0  
NOAA 11045

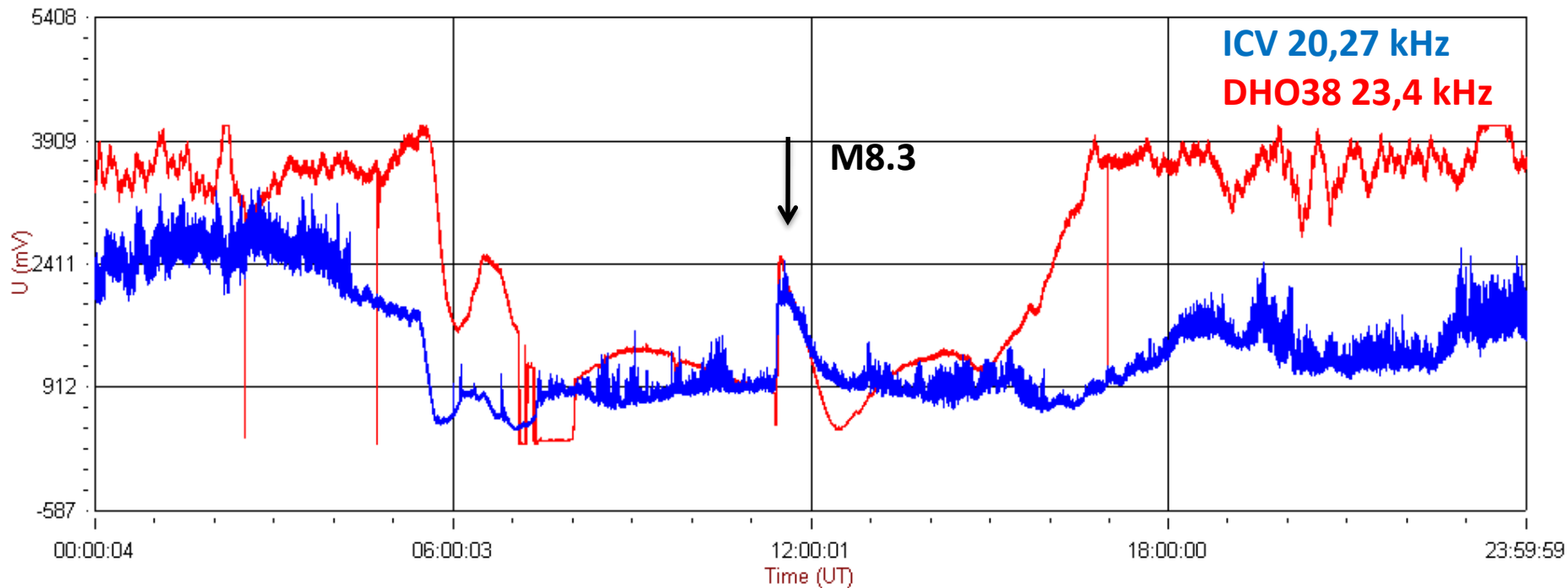
Erupcia M4.0 z dôvodu  
odstávky vysielajúča  
zachytená nebola



Rudlof Slošiar – Bojnice  
8.2.2010  
M4.0, C1.8, M1.1, M2.0  
NOAA 11045



Lionel Loudet A118, GOES 14  
 8.2.2010  
 M4.0, C1.8, M1.1, M2.0  
 NOAA 11045



HaP Hlohovec  
 12.2.2010  
 M8.3  
 NOAA 11046

Doteraz najsilnejšia nami  
 zachytená erupcia

Doteraz najslabšia:  
 B3.6

25.3.2010 NOAA 11057

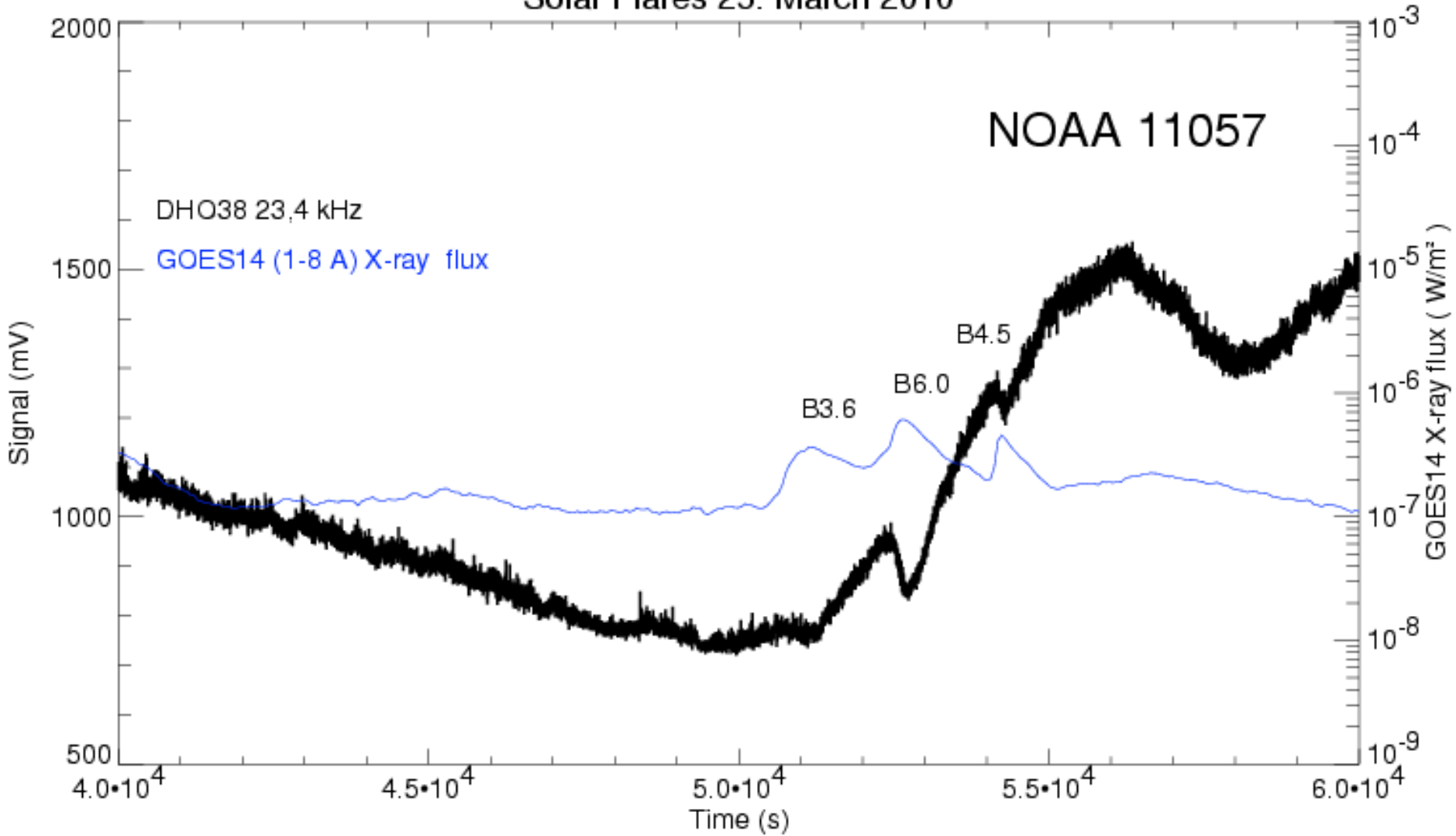


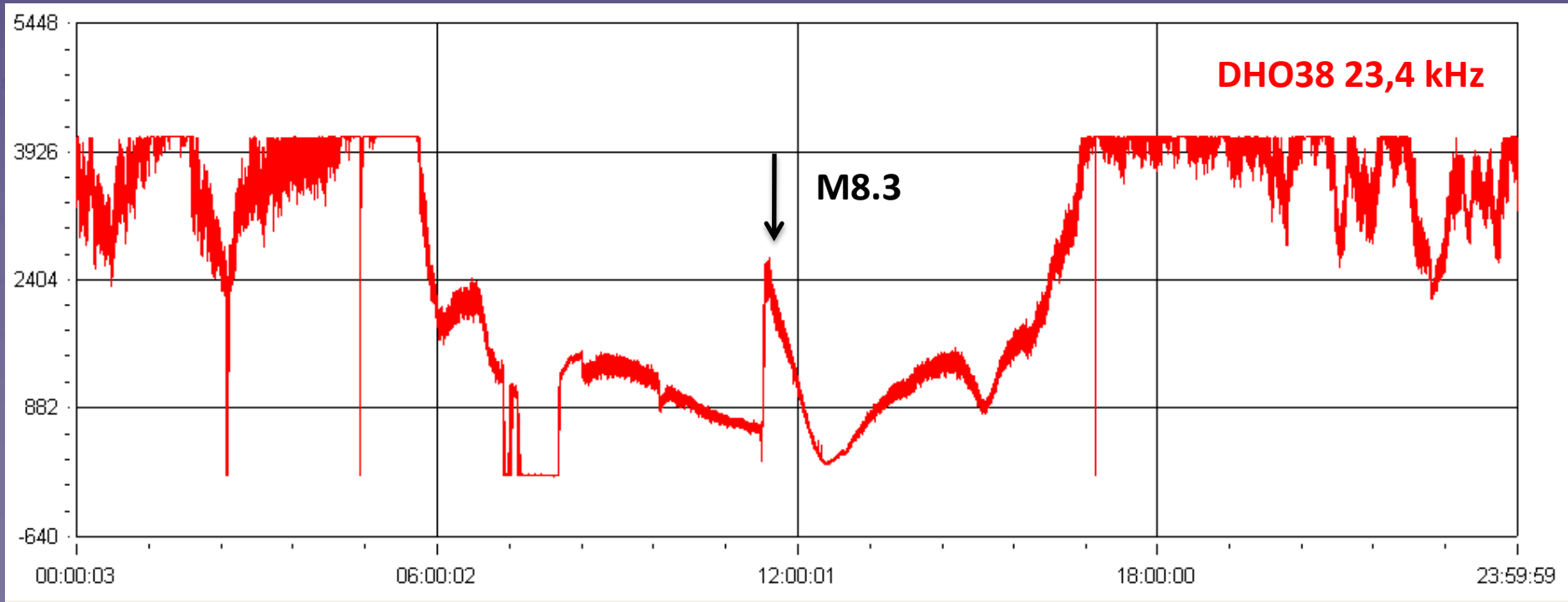
# Solar Flares 25. March 2010

## NOAA 11057

DHO38 23,4 kHz

GOES14 (1-8 A) X-ray flux



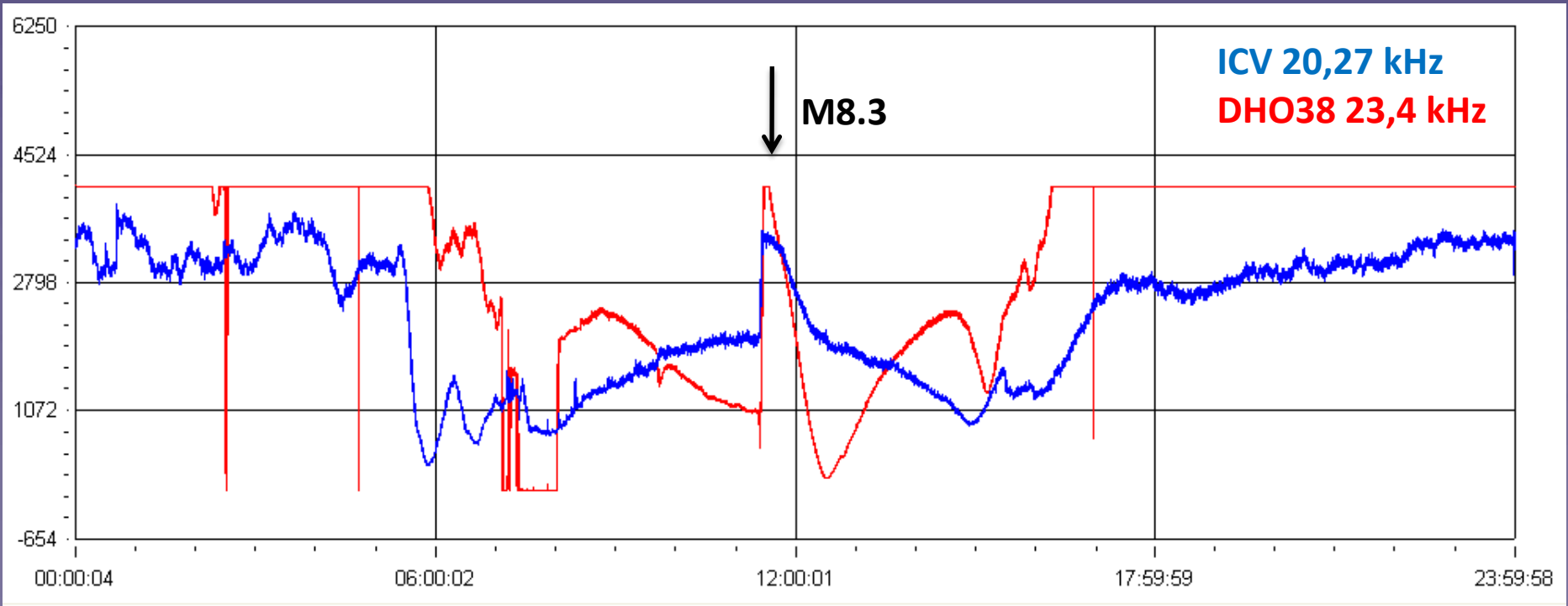


Hvezdáreň v Partizánskom

12.2.2010

M8.3

NOAA 11046

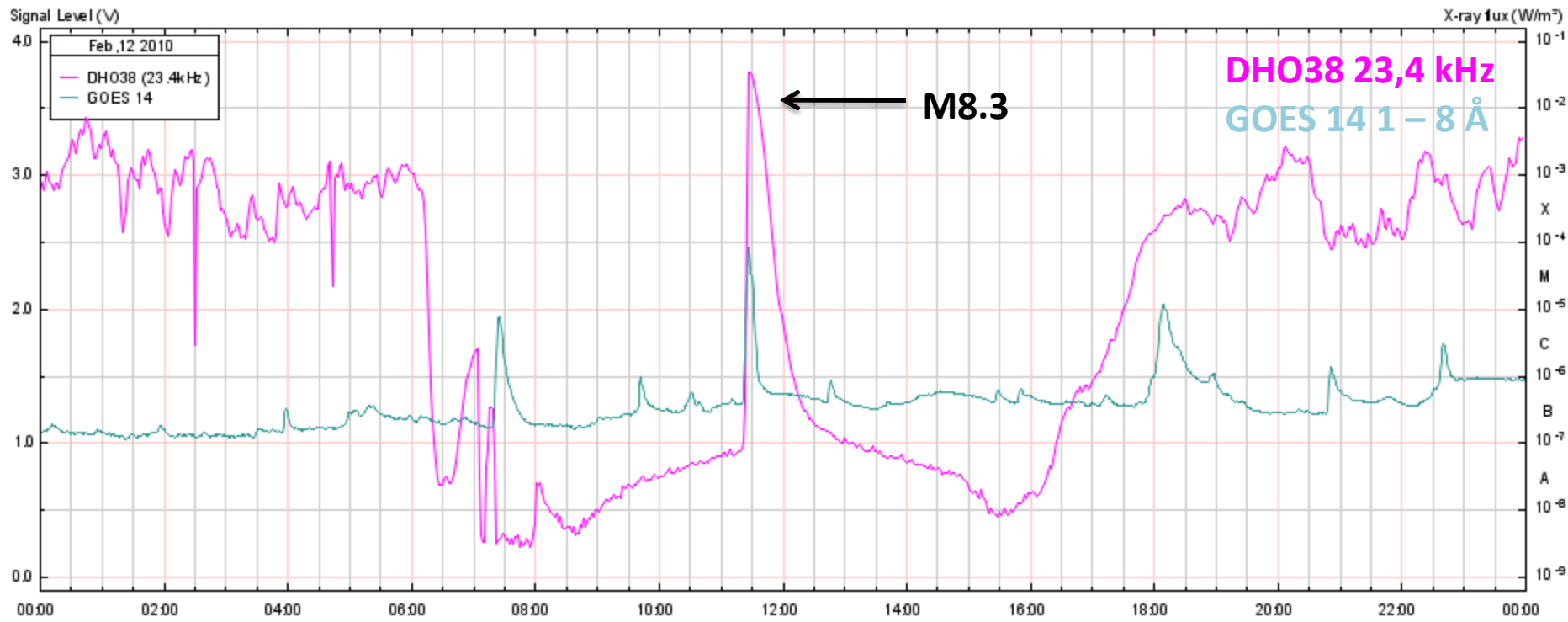


Rudlof Slošiar – Bojnice

12.2.2010

M8.3

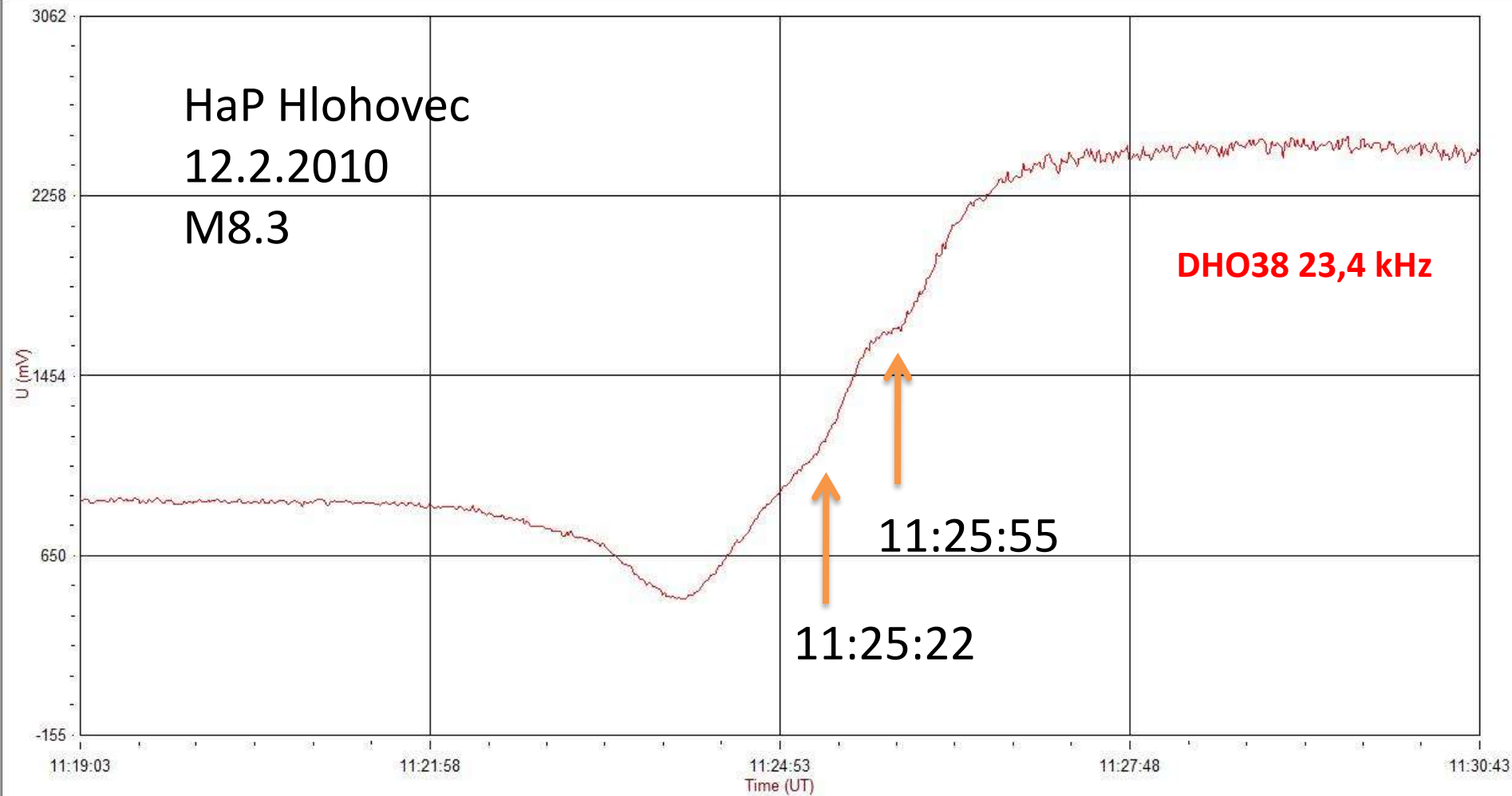
NOAA 11046



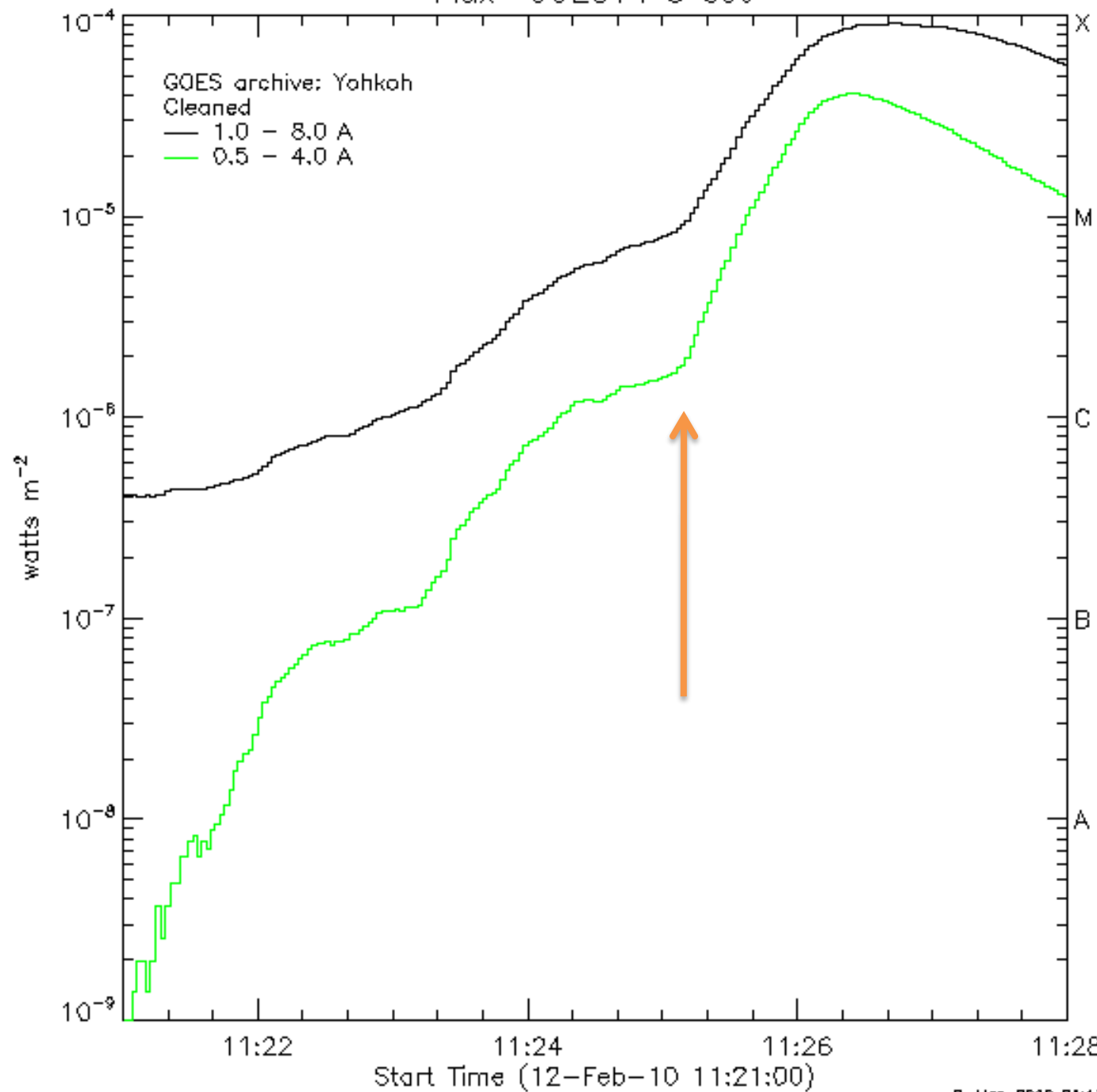
Lionel Loudet A118, GOES 14  
12.2.2010  
M8.3  
NOAA 11046

HaP Hlohovec  
12.2.2010  
M8.3

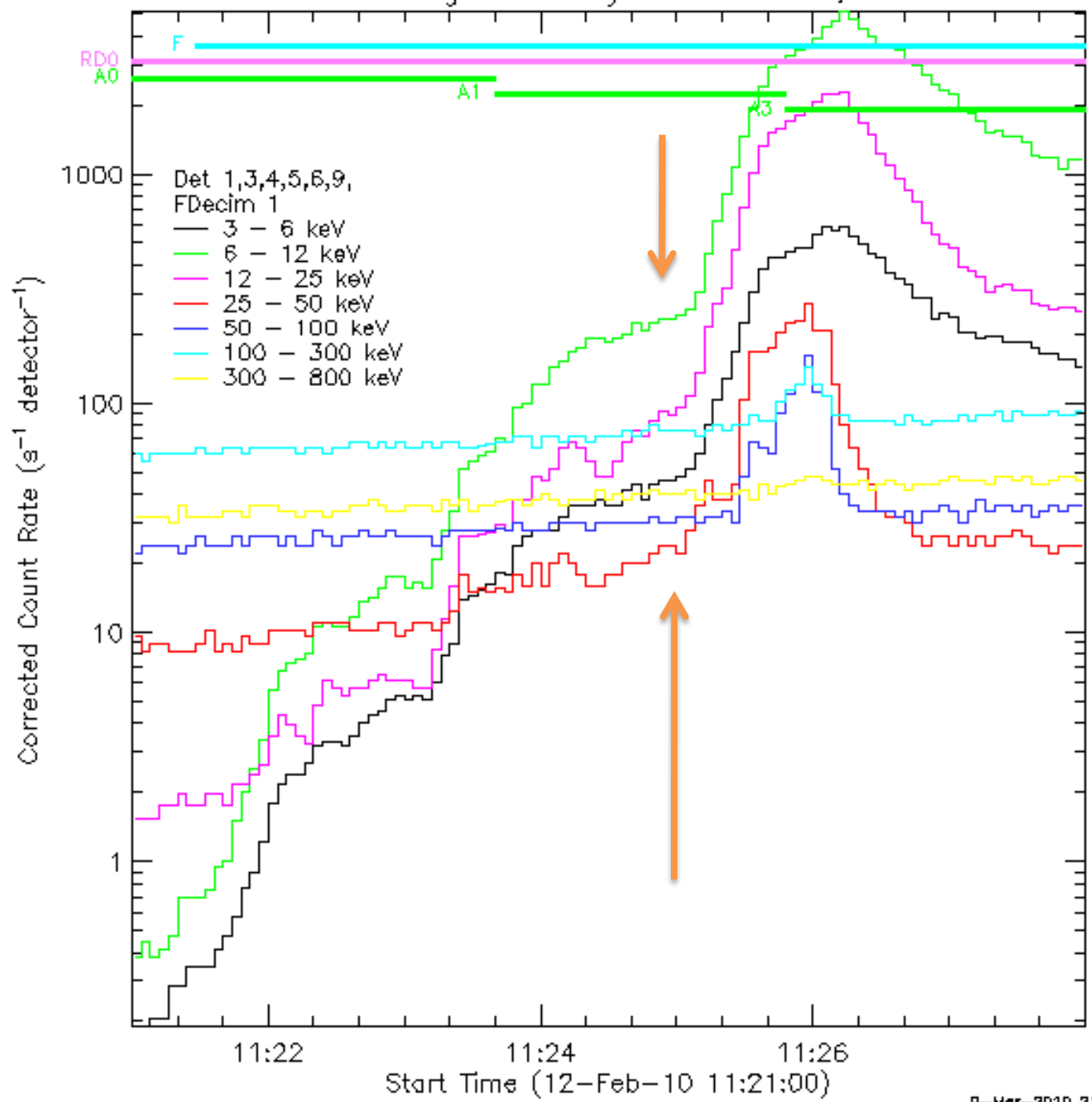
**DHO38 23,4 kHz**

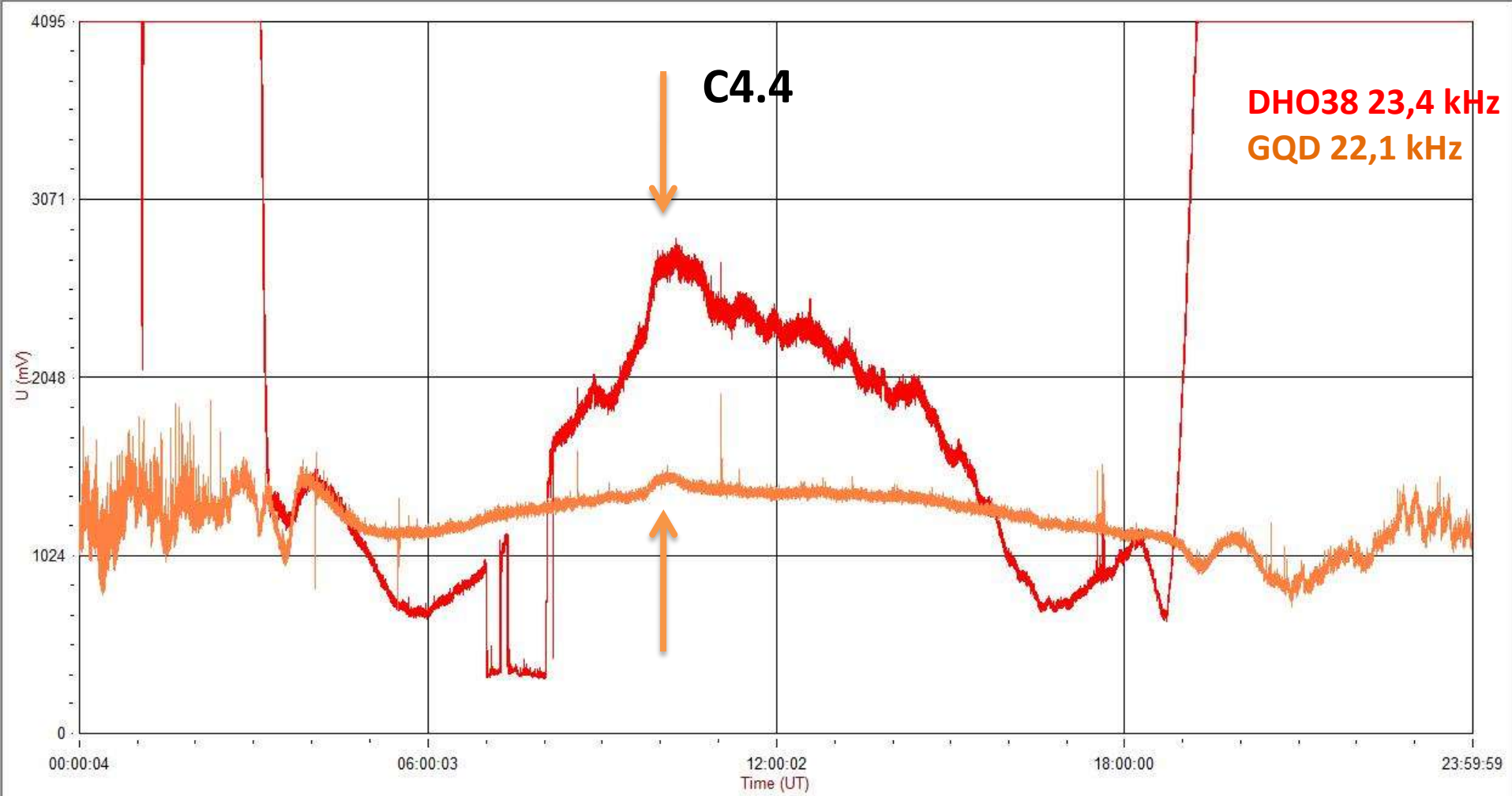


# Flux GOES14 3 sec



# HESSI Observing Summary Count Rates, Corrected





HaP Hlohovec

14.8.2010

C4.4

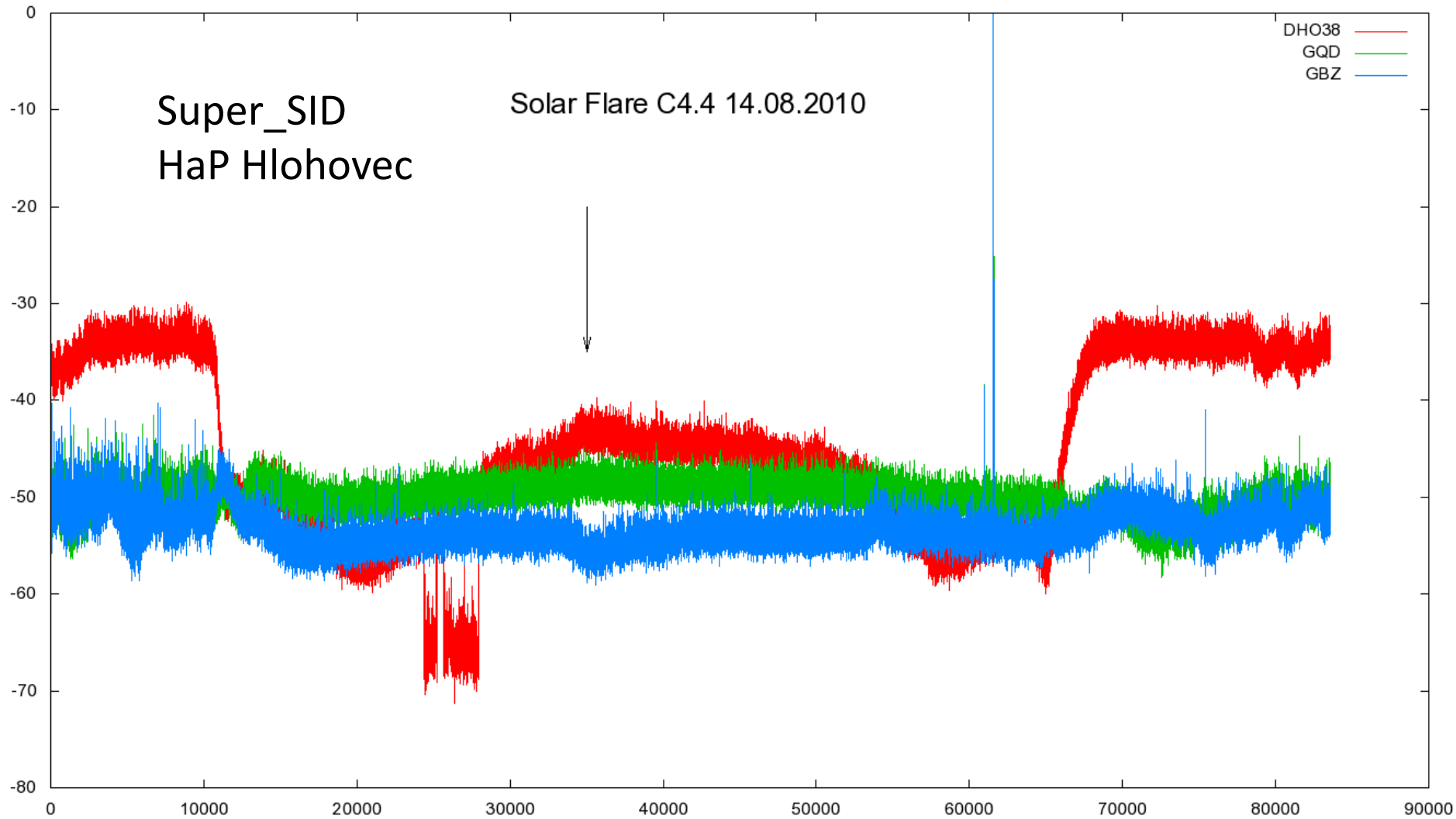
NOAA 11099



Super\_SID  
HaP Hlohovec

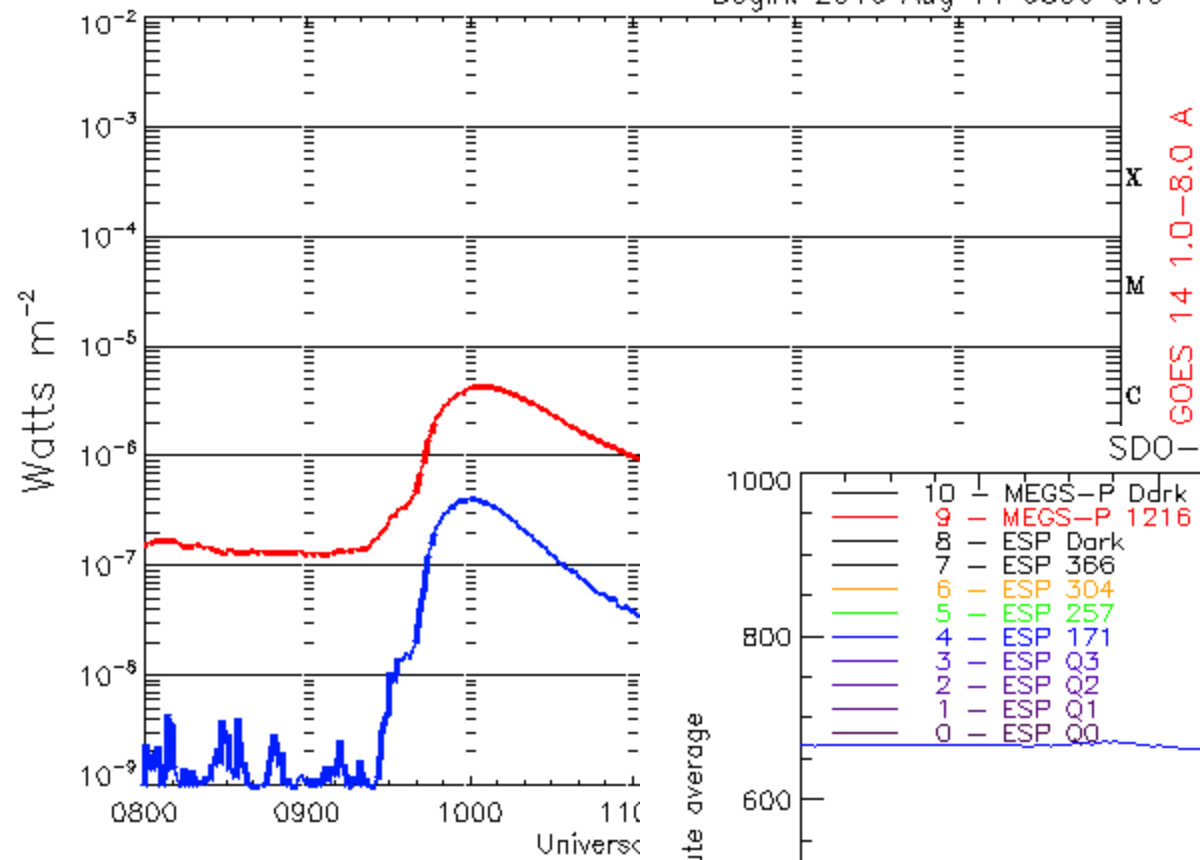
Solar Flare C4.4 14.08.2010

DHO38 ———  
GQD ———  
GBZ ———



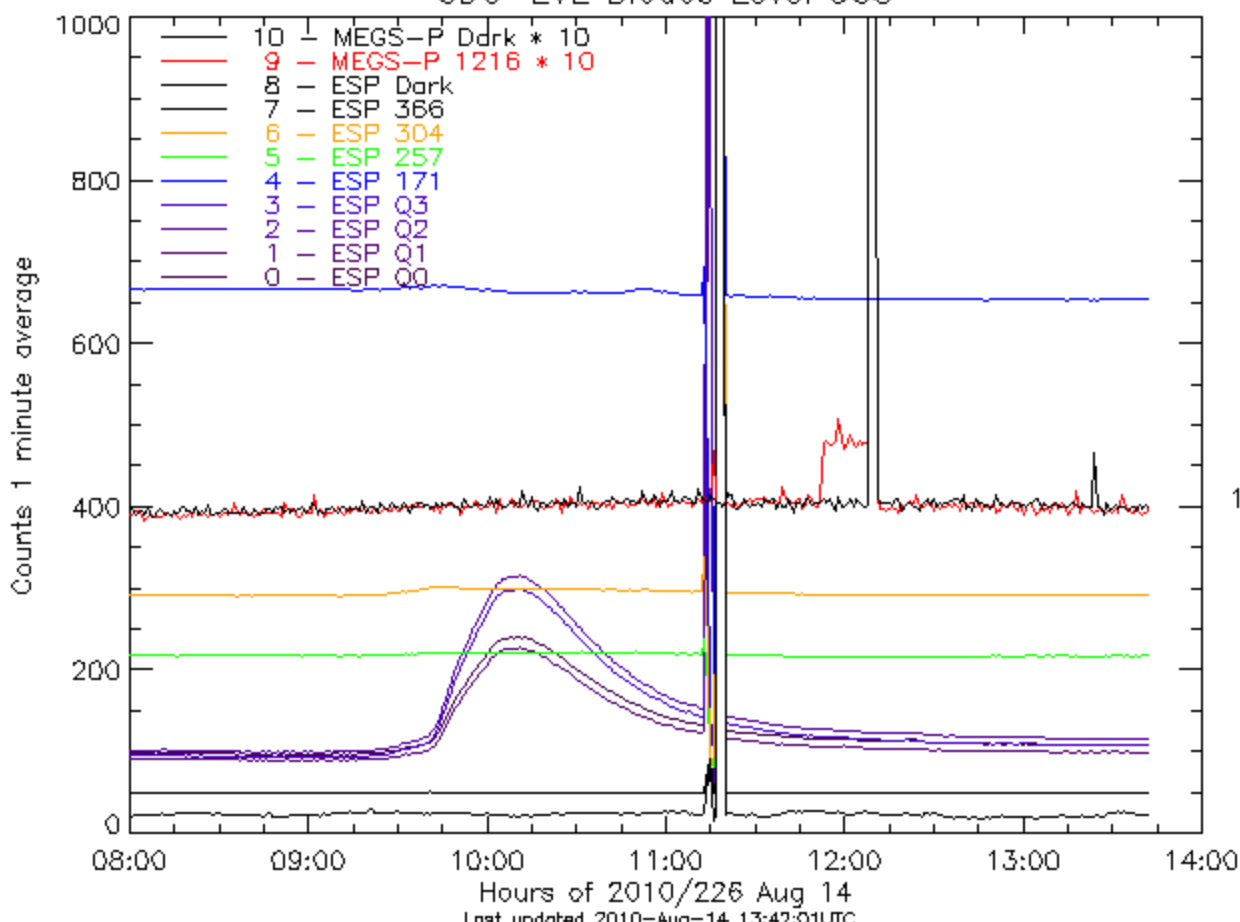
GOES X-ray Flux (1 minute data)

Begin: 2010 Aug 14 0800 UTC



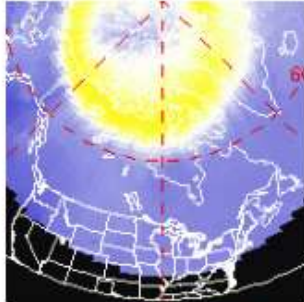
Updated 2010 Aug 14 1334 UTC

SDO-EVE Diodes Level OCS



10.7 cm flux: 85 sfu  
[explanation](#) | [more data](#)  
Updated 14 Aug2010

### Current Auroral Oval:



Switch to: [Europe](#), [USA](#),  
[New Zealand](#), [Antarctica](#)  
Credit: NOAA/POES

**Planetary K-index**  
Now: Kp= 0 quiet  
24-hr max: Kp= 2 quiet  
[explanation](#) | [more data](#)

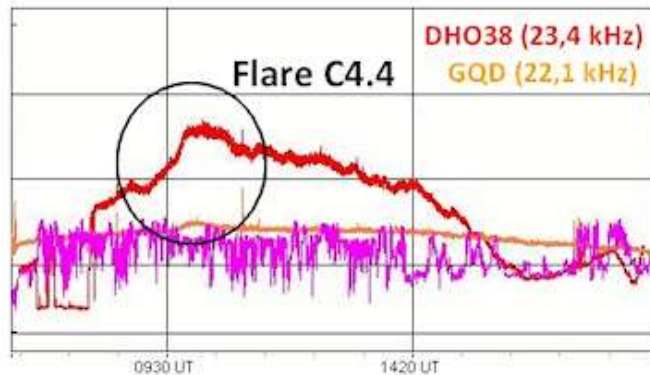
**Interplanetary Mag. Field**  
B<sub>total</sub>: 3.9 nT  
B<sub>z</sub>: 2.9 nT south  
[explanation](#) | [more data](#)  
Updated: Today at 1157 UT

### Coronal Holes:



**more images:** [from Kristian Molnar](#) of Blahova, Slovakia; [from Cai-Usu Wohler](#) of Bispingen, Germany; [from Z. Roy and J. Stetson](#) of South Portland, Maine; [from Jan Timmermans](#) of Valkenswaard, The Netherlands;

**IONOSPHERIC DISTURBANCE:** The C4-class solar flare of Aug. 14th bathed Earth's upper atmosphere in X-rays and caused a wave of ionization to sweep over Europe. This improved the propagation of low-frequency radio signals which use the ionosphere as a reflector to skip over the horizon. A SID monitor operated by Jan Karlovsky of Hlohovec, Slovakia, recorded the effect:



"SID" stands for Sudden Ionospheric Disturbance, and a "SID monitor" is a radio receiver that monitors ~20 kHz signals from distant transmitters. "My system easily detected the effects of the solar flare," says Karlovsky. "I monitor two stations: DHO38 in Germany (23.4 kHz) and GQD in Great Britain (22.1 kHz). The German signal was most strongly boosted."

With solar activity on the rise, sudden ionospheric disturbances will become more common. Interested? Stanford University tells you how to build [your own SID monitor](#).

## [2010 Perseid Photo Gallery](#)

[\[meteor radar\]](#) [\[Perseid fireball cam\]](#)



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on the [moon](#)



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[Knowledge.Allianz.co](#)

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*Mega*  
**GALLERY**

sponsors



GOES-14 SXI  
(Solar X-ray Imager)  
6 – 60 Å  
14.8.2010  
NOAA 11099

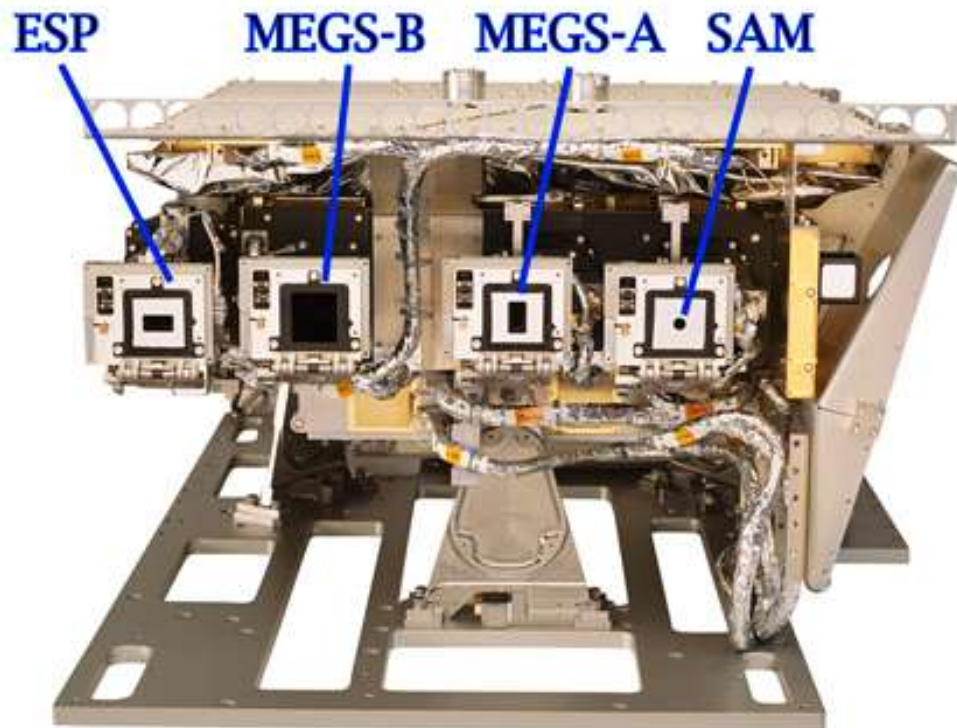
GOES-14 SXI FL Raw 0x1c220300  
NOAA/SWPC 12BIT  
Boulder, CO 1x1

Scale  
(DN)

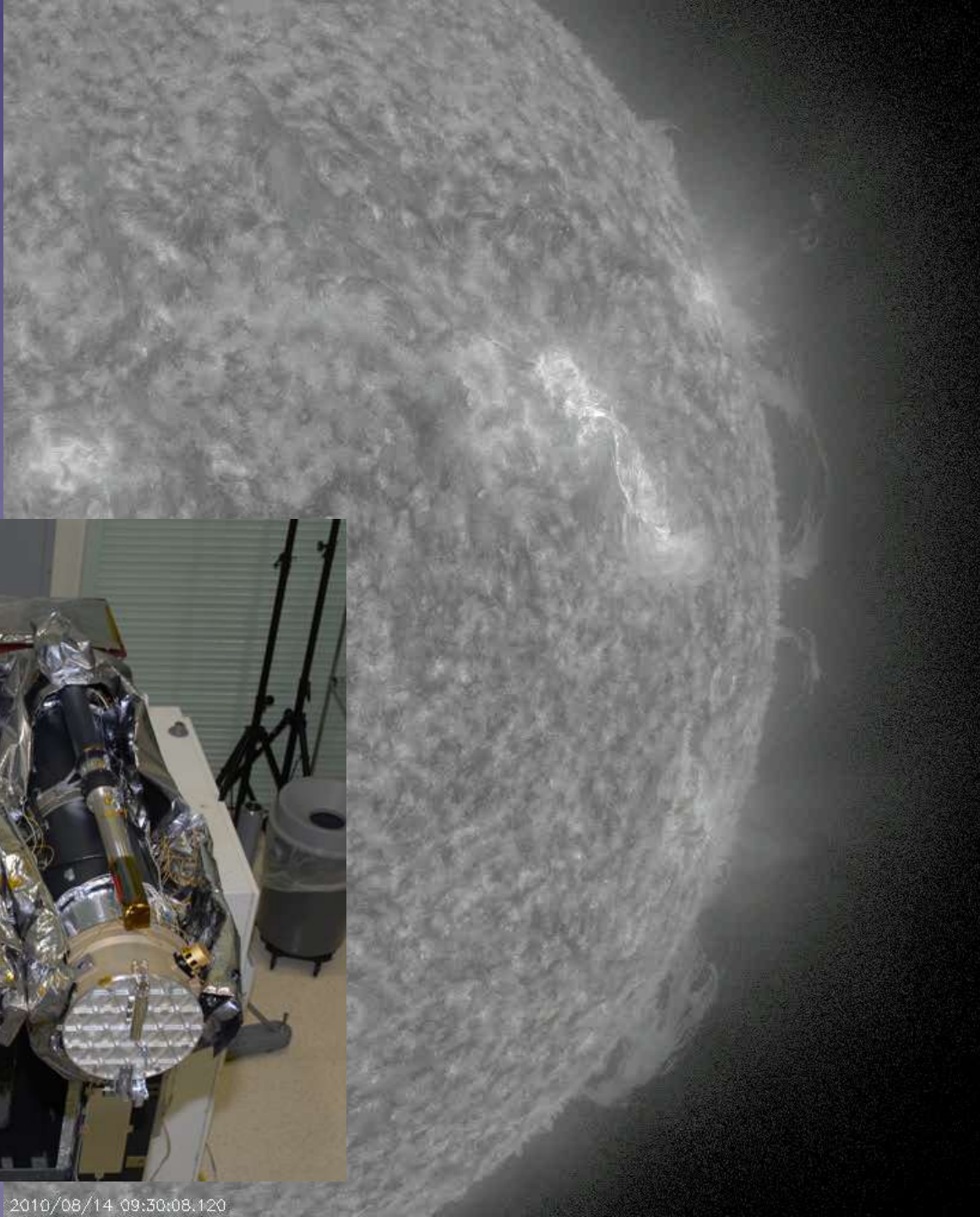
4095
2048
1024
512
256
128
64
32
16
8
4

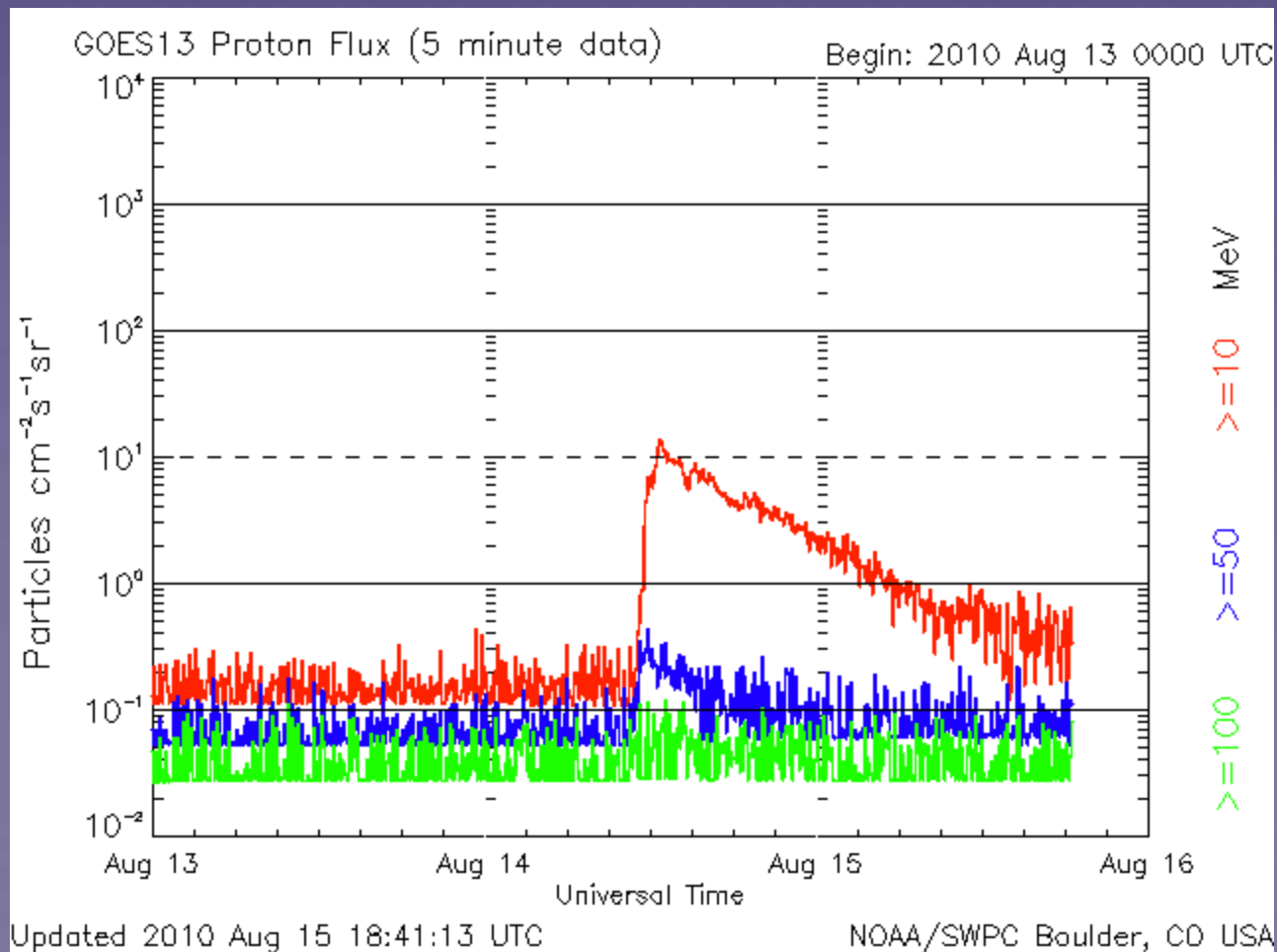


SDO/EVE SAM  
Extreme UV Variability  
Experiment  
1 – 70 Å  
14.8.2010  
NOAA 11099




SDO/AIA 304 Å  
(Atmospheric Imaging  
Assembly)  
14.8.2010  
NOAA 11099





# DH038

## Rhauderfehn, Nemecko

Frekvencia: 23,4 kHz 

Vyžiarený výkon: 500 kW



# Ďakujem za pozornosť



Ján Karlovský - [solarobserver@gmail.com](mailto:solarobserver@gmail.com)

refraktor 180/2600, HaP M. R. Štefánika Hlohovec