

Aurinkohavainnot Hankasalmen radioteleskoopilla

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Jyväskylän Sirius ry

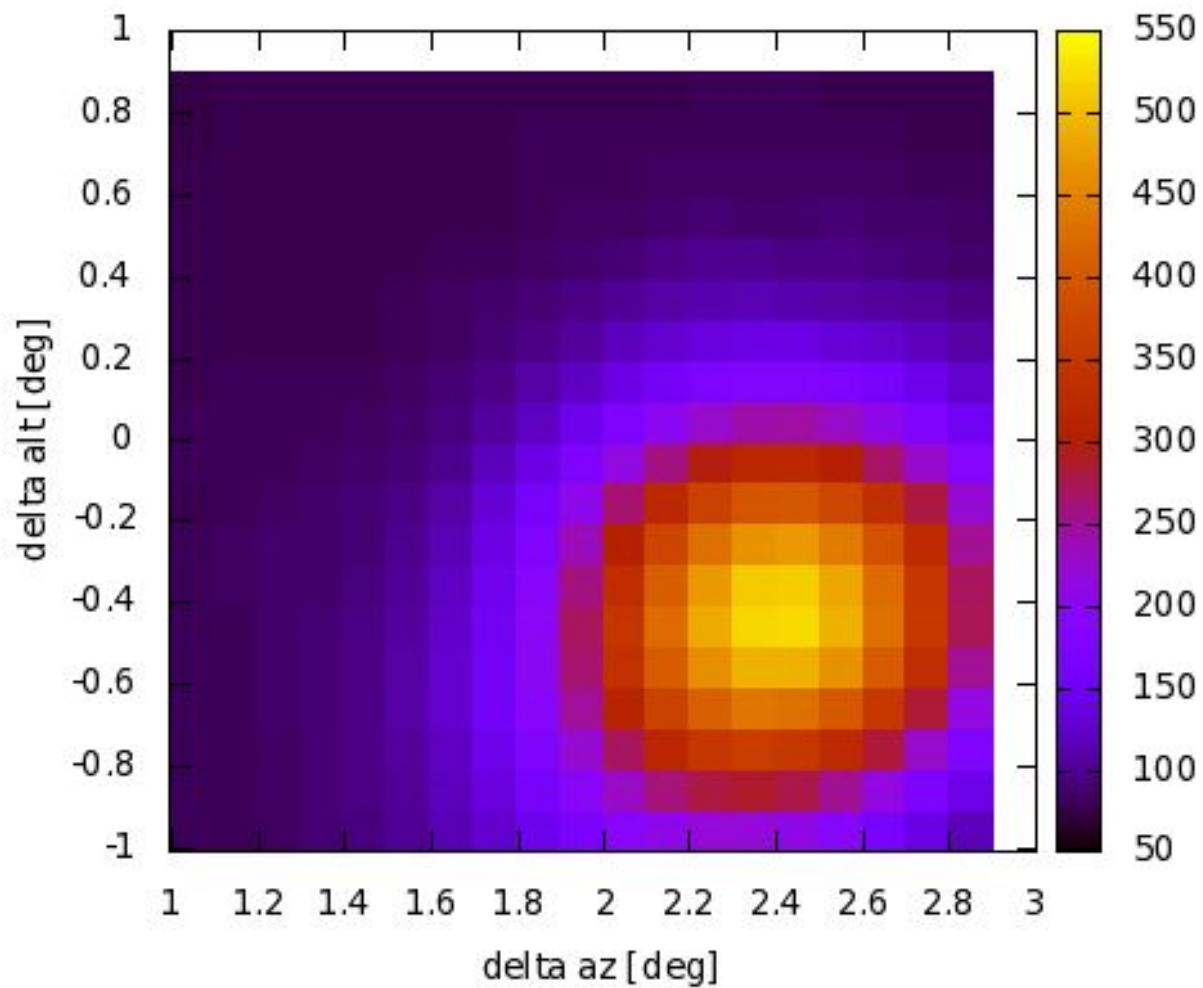
Hankasalmen radioteleskooppi

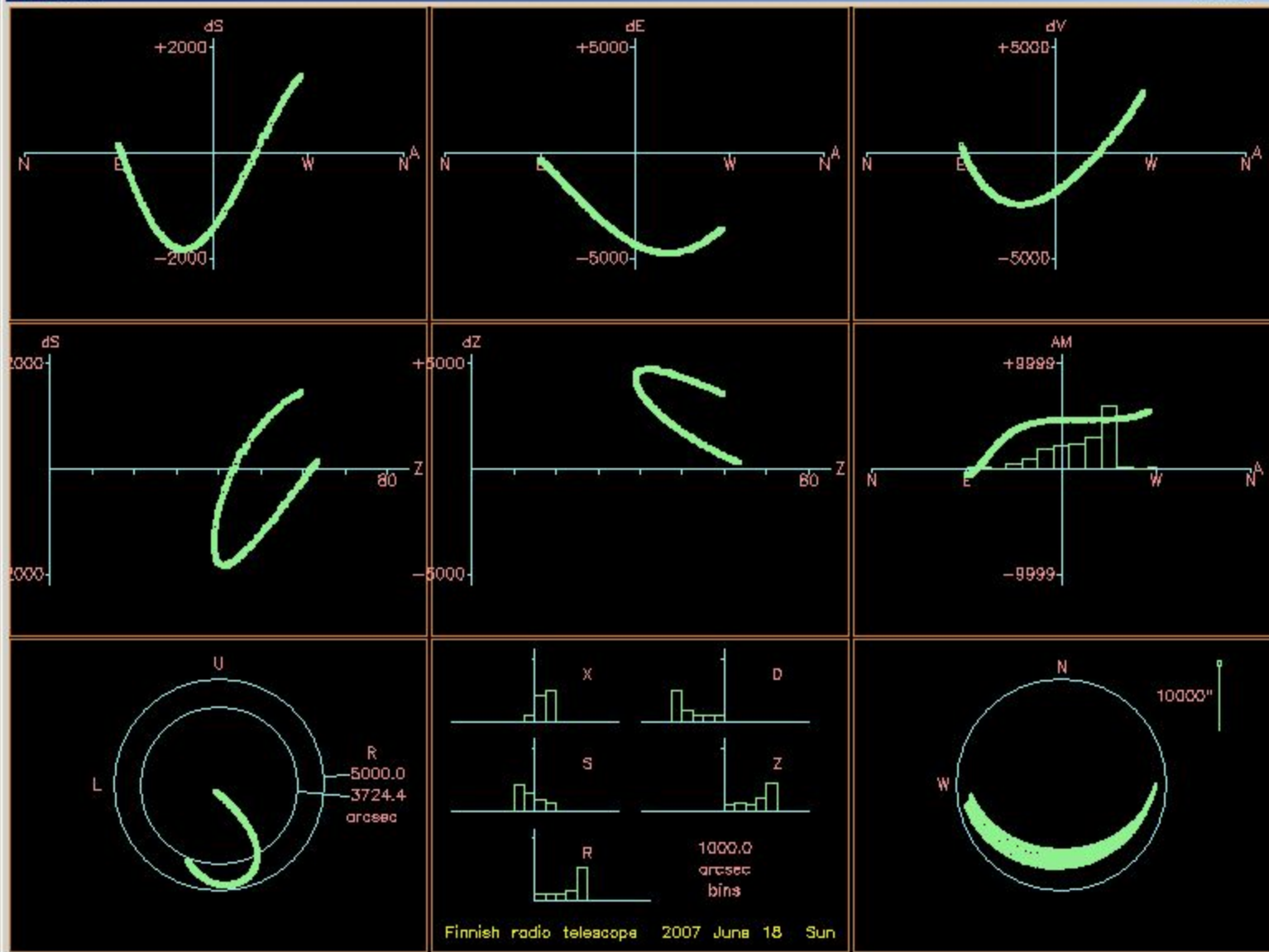
- 3 m paraboloidi
- ex venäläinen säätutka
- siirrettiin Nyrölästä
- AOR AR5000A liikennevastaanotin
- **diodivastaanotin**
- **10.7-11.7 GHz satelliittimikropää**
- 1.4/1.7/8.4/10 GHz
- tietokoneohjaus
- etäkäyttö



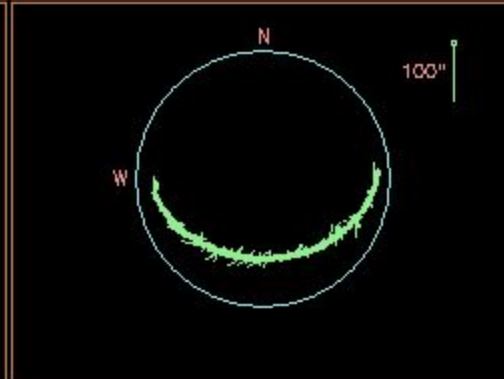
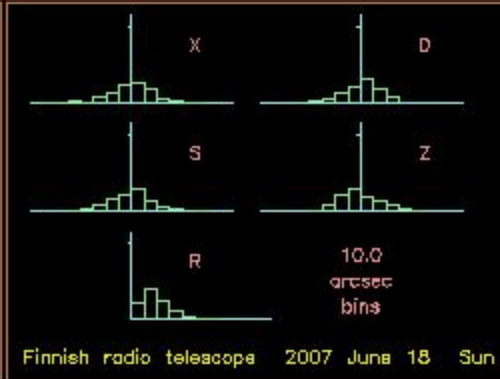
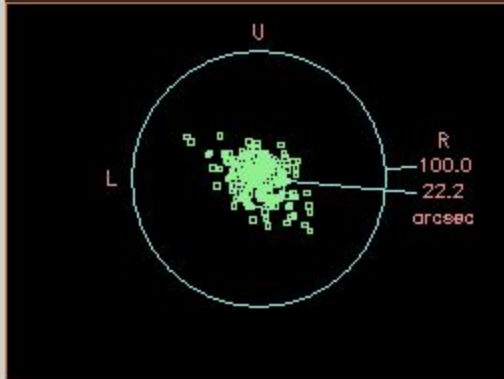
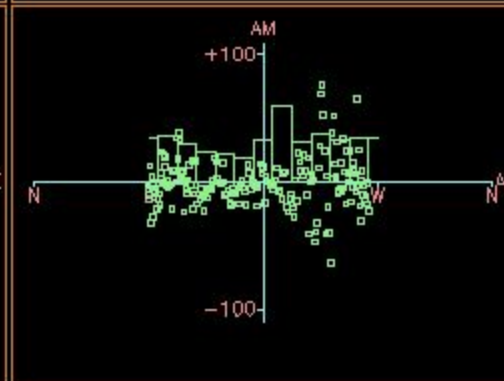
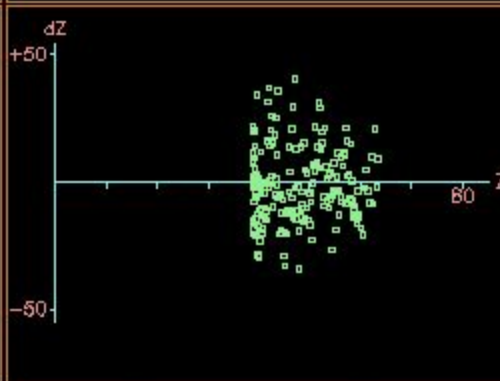
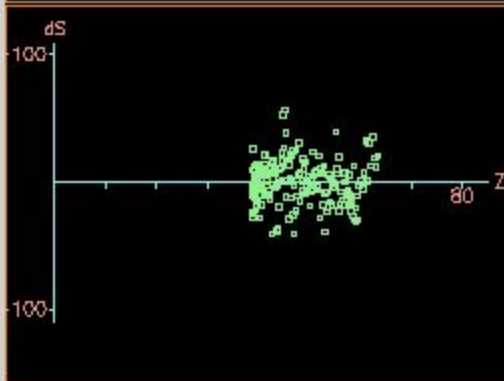
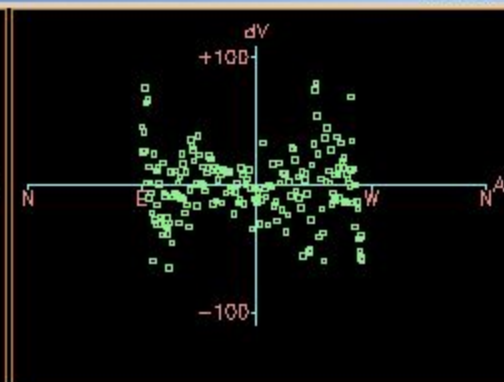
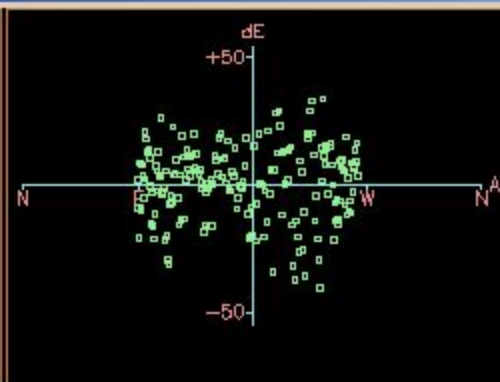
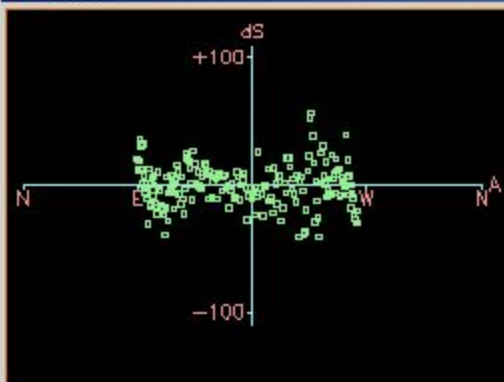
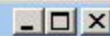


Auringon radiokuva



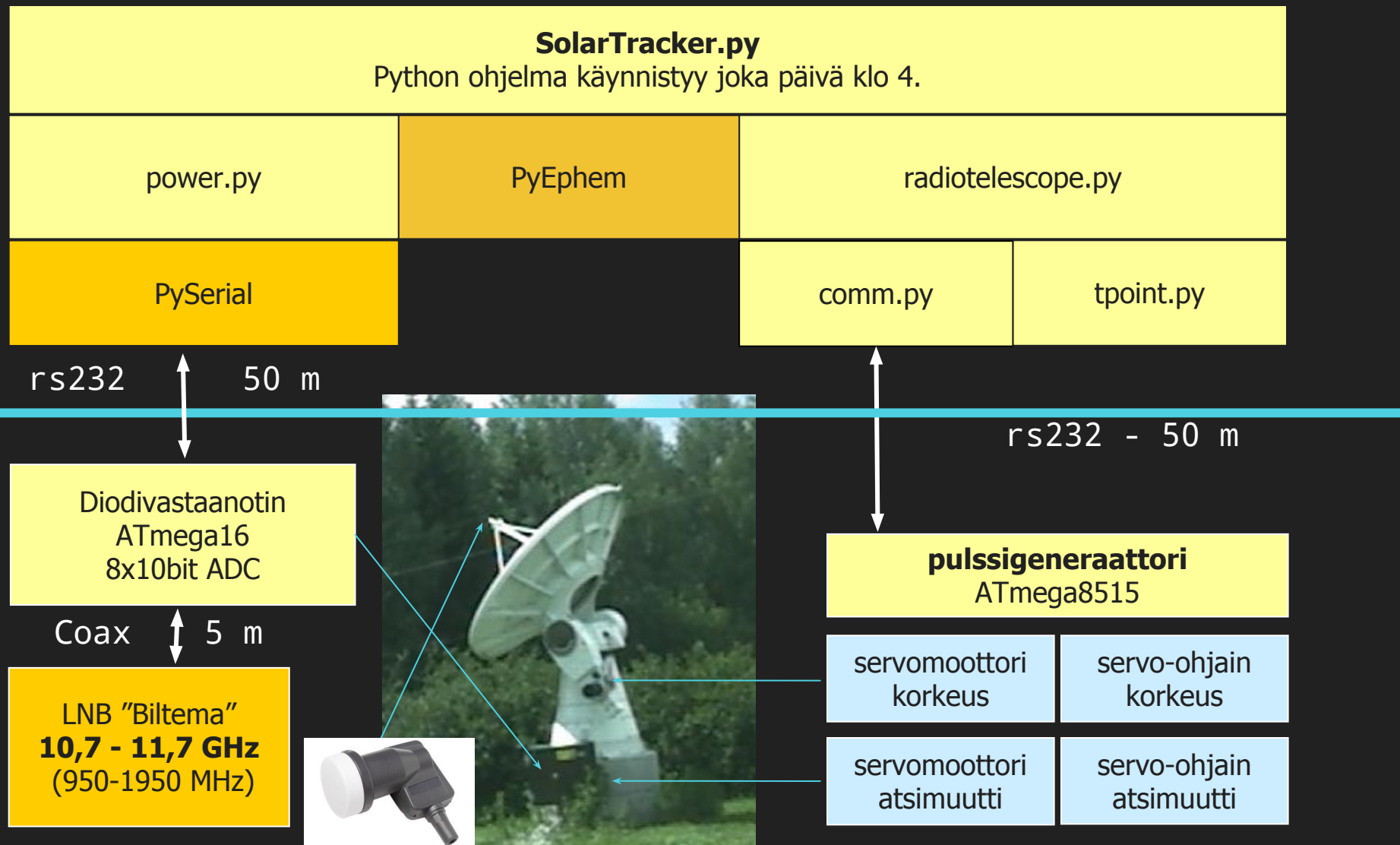


76 tpoint



Finnish radio telescope 2007 June 18 Sun

Radioteleskoopin komponentit



SolarTracker.py

```
...  
...  
while s.alt > math.radians(10.0):  
    o.date = ephem.now()  
    sun.compute(o)  
    r = (math.degrees(sun.ra))/180.*12.  
    d = math.degrees(sun.dec)  
    radiotelescope.slewto_rade(r,d)  
    observe9(10000)  
...  
...
```


Havaintostrategia

Havaintoja tehdään maaliskuun alusta lokakuun loppuun Auringon ollessa vähintään 10 asteen korkeudella horisontista.

Keskimäärin 12 tuntia päivässä

60 minuuttia tunnissa

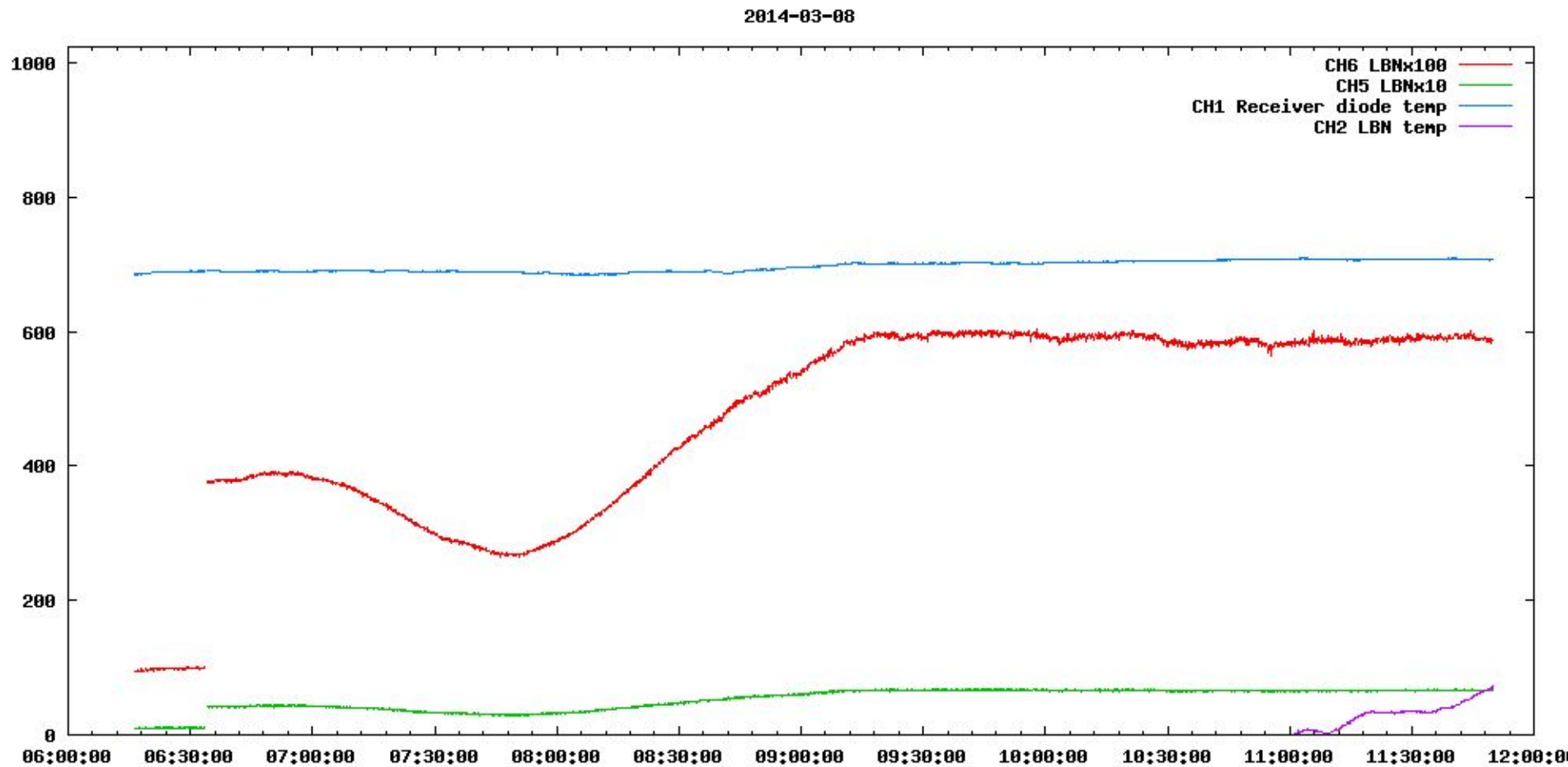
60 sekuntia minuutissa

100 mittausta sekunnissa

Noin 4 miljoonaa mittausta päivässä

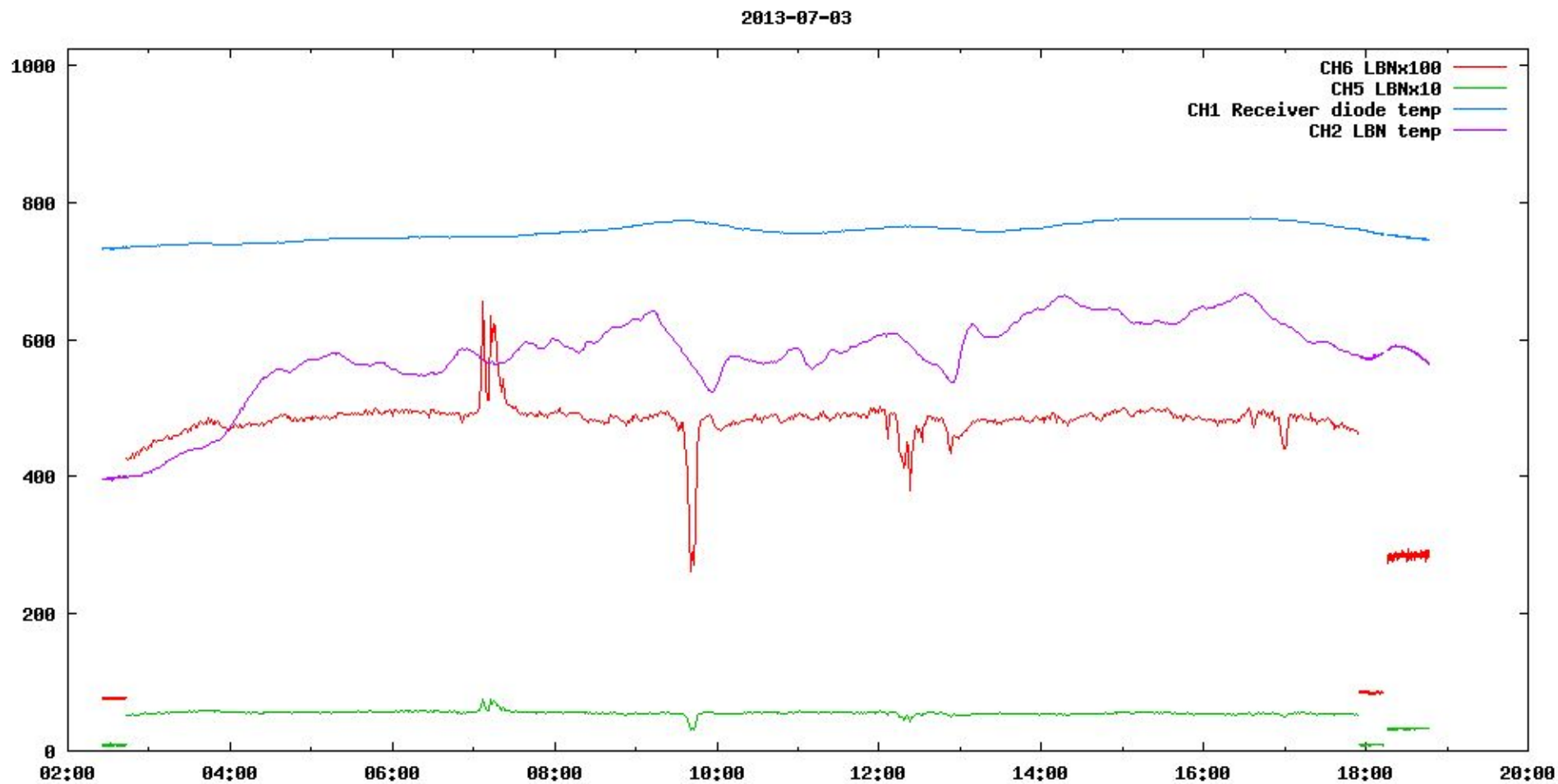
Noin miljardi mittausta vuodessa!

Aurinko “tänään”

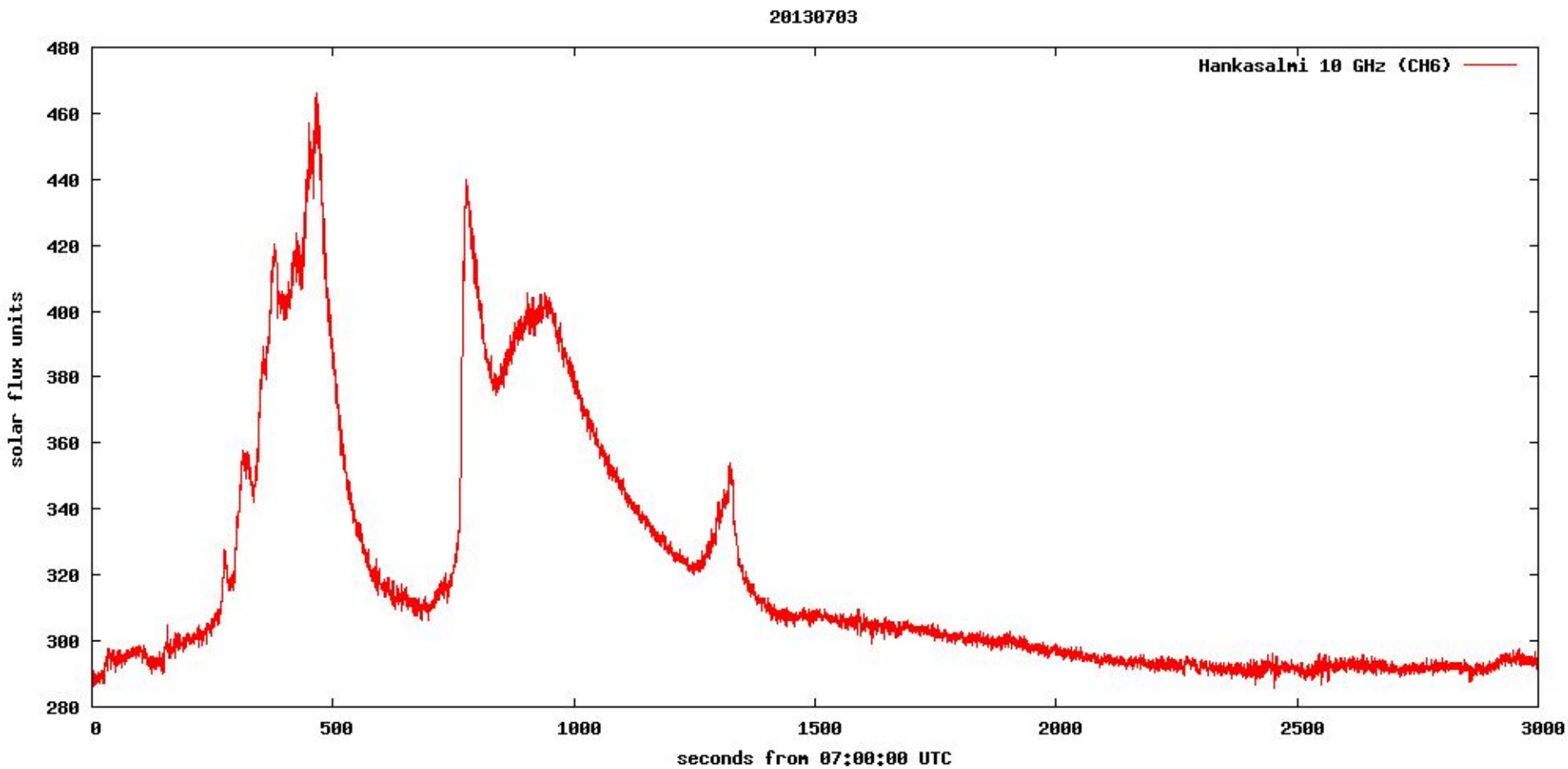


<http://murtoinen.jkl Sirius.fi:8888/sun/sun.png>

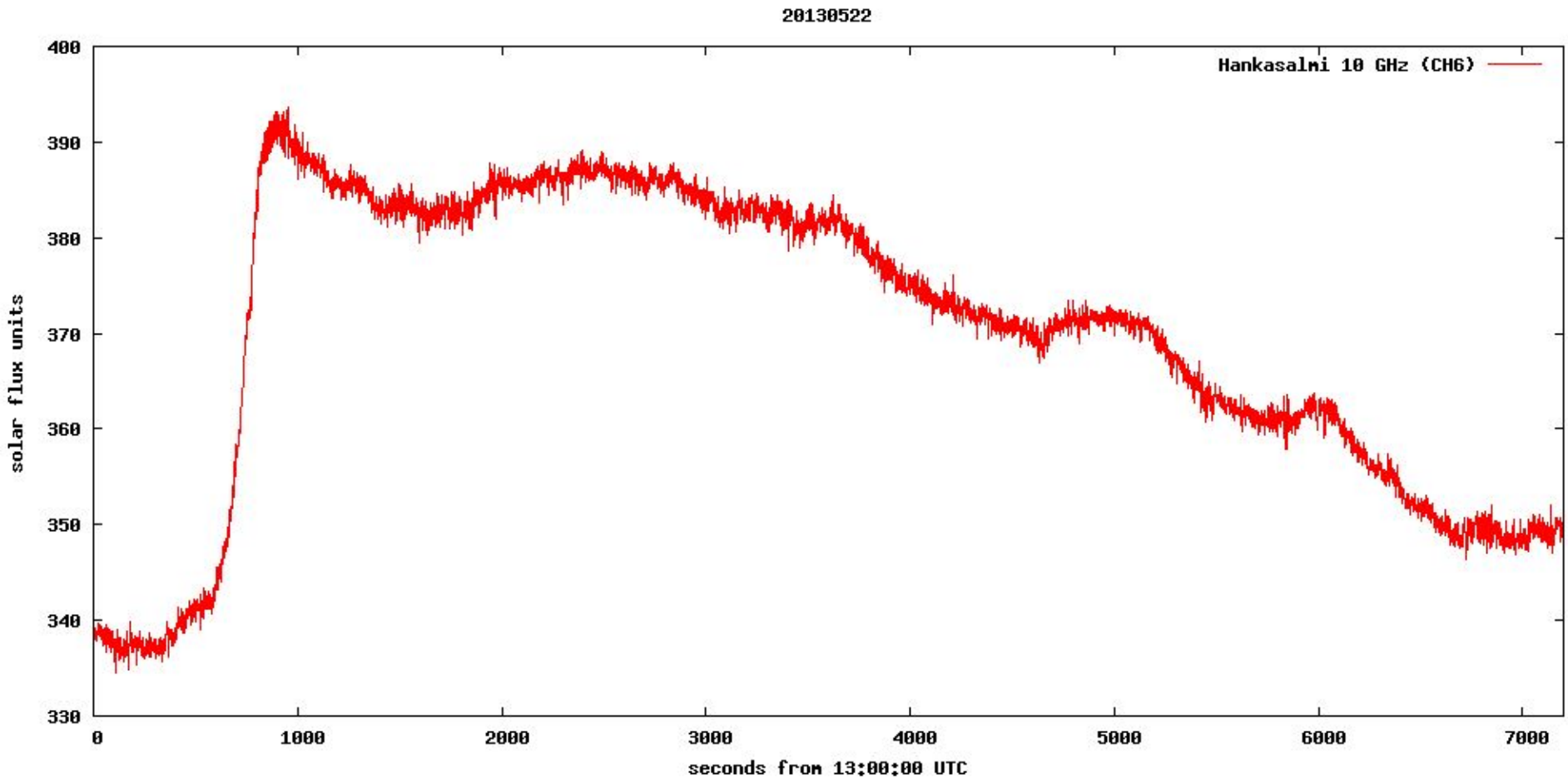
Aurinko 3.7.2013



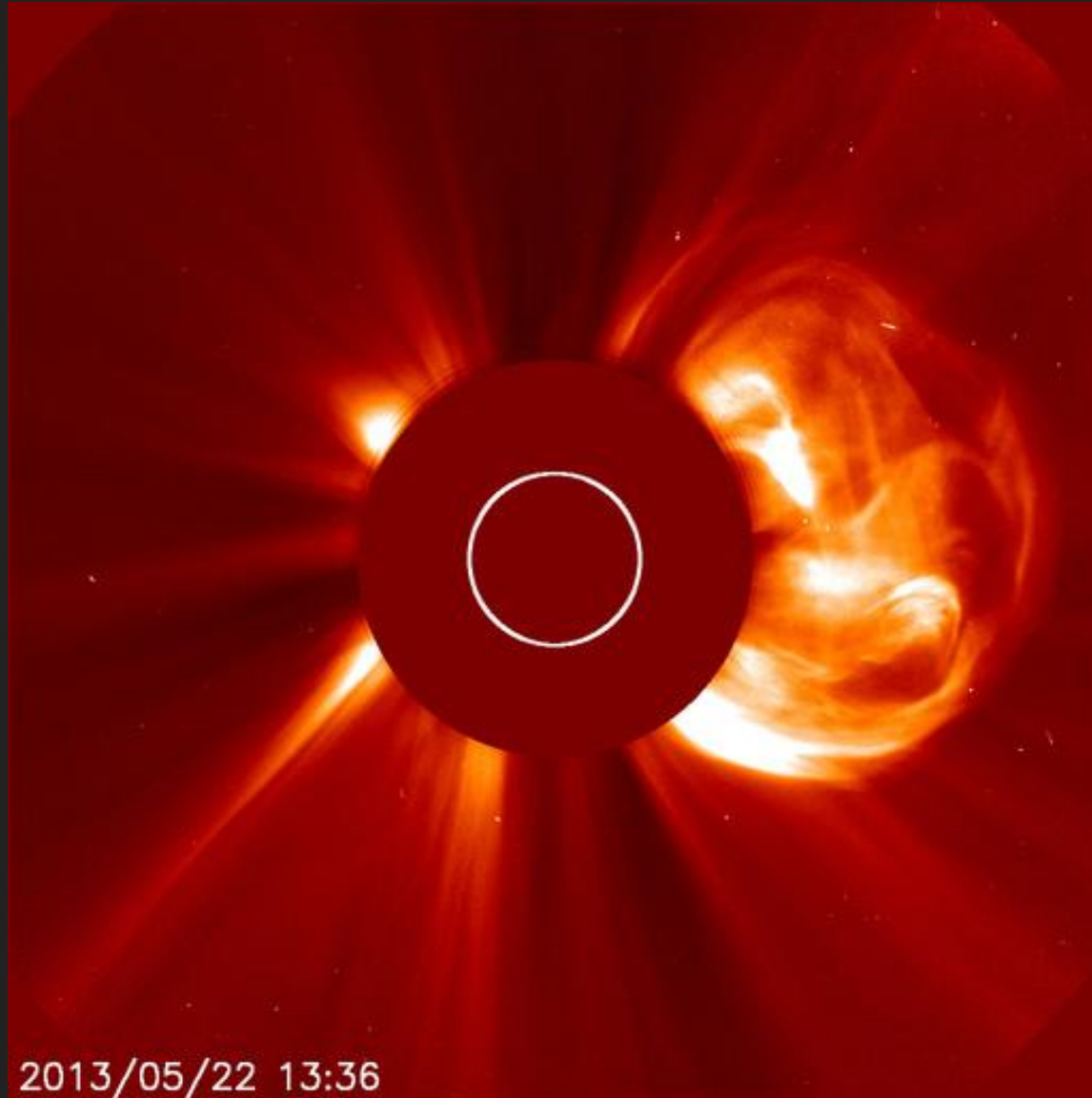
3.7.2013 07:08 UTC - M1.5



22.5.2013 13:00 UTC - M5.0

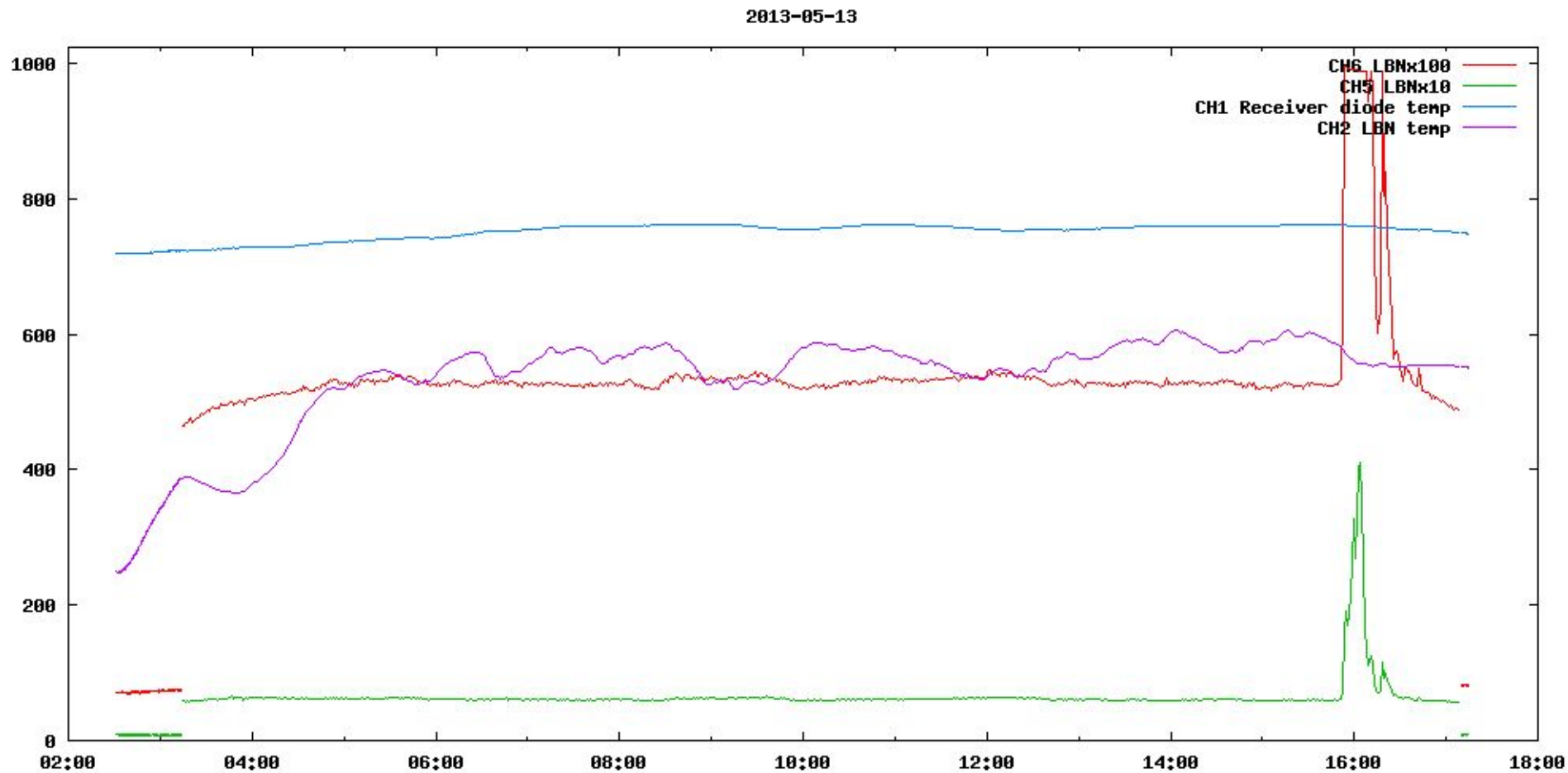


SOHO

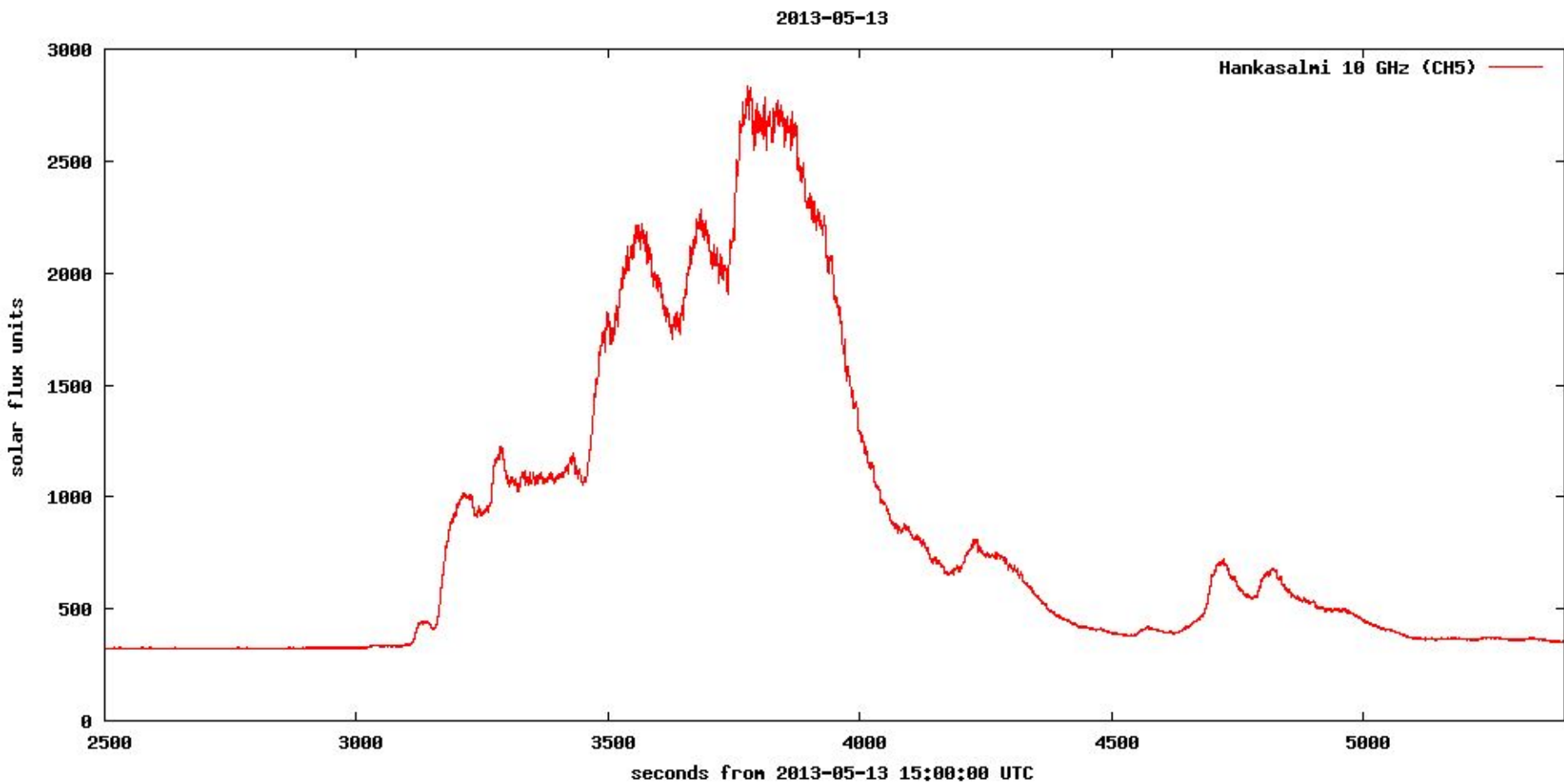


2013/05/22 13:36

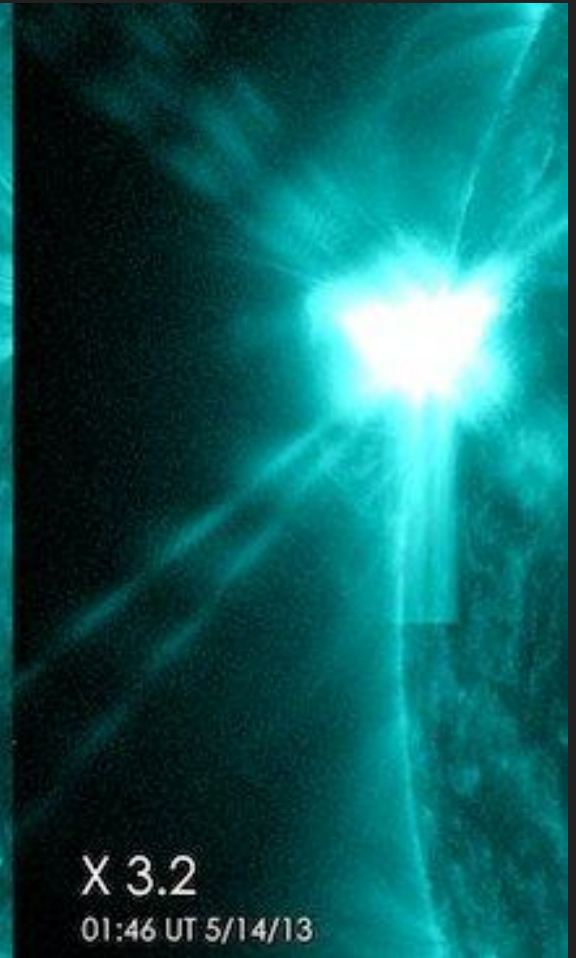
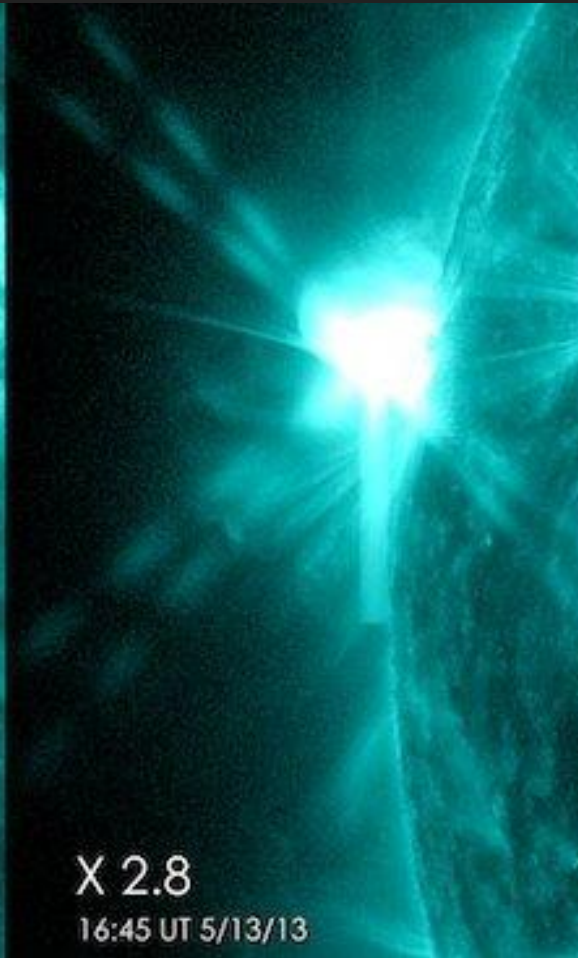
13.5.2013 16:00 UTC - X2.8 !!



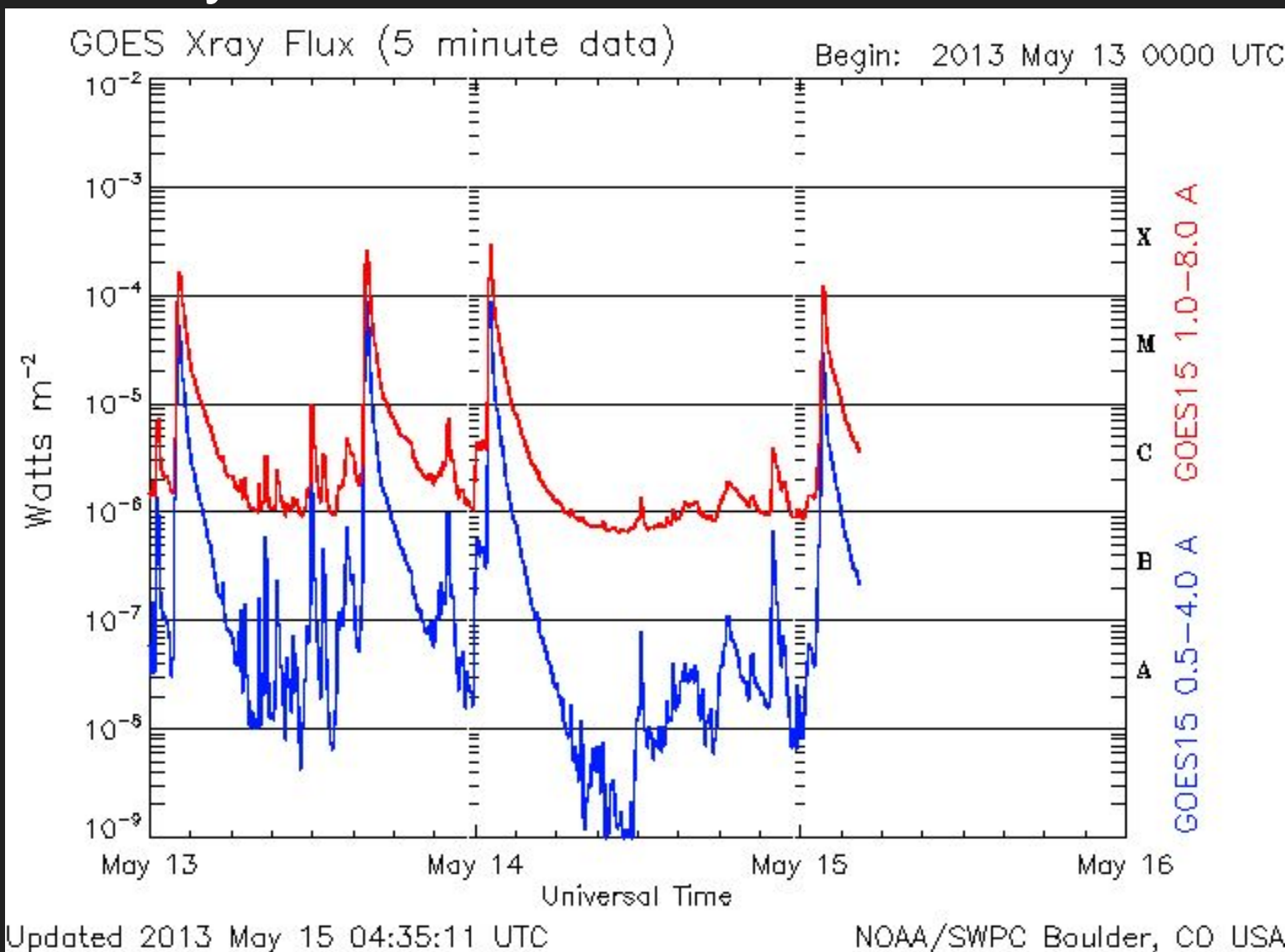
13.5.2013 16:00 UTC - X2.8 !!



SDO 13-14.5.2013

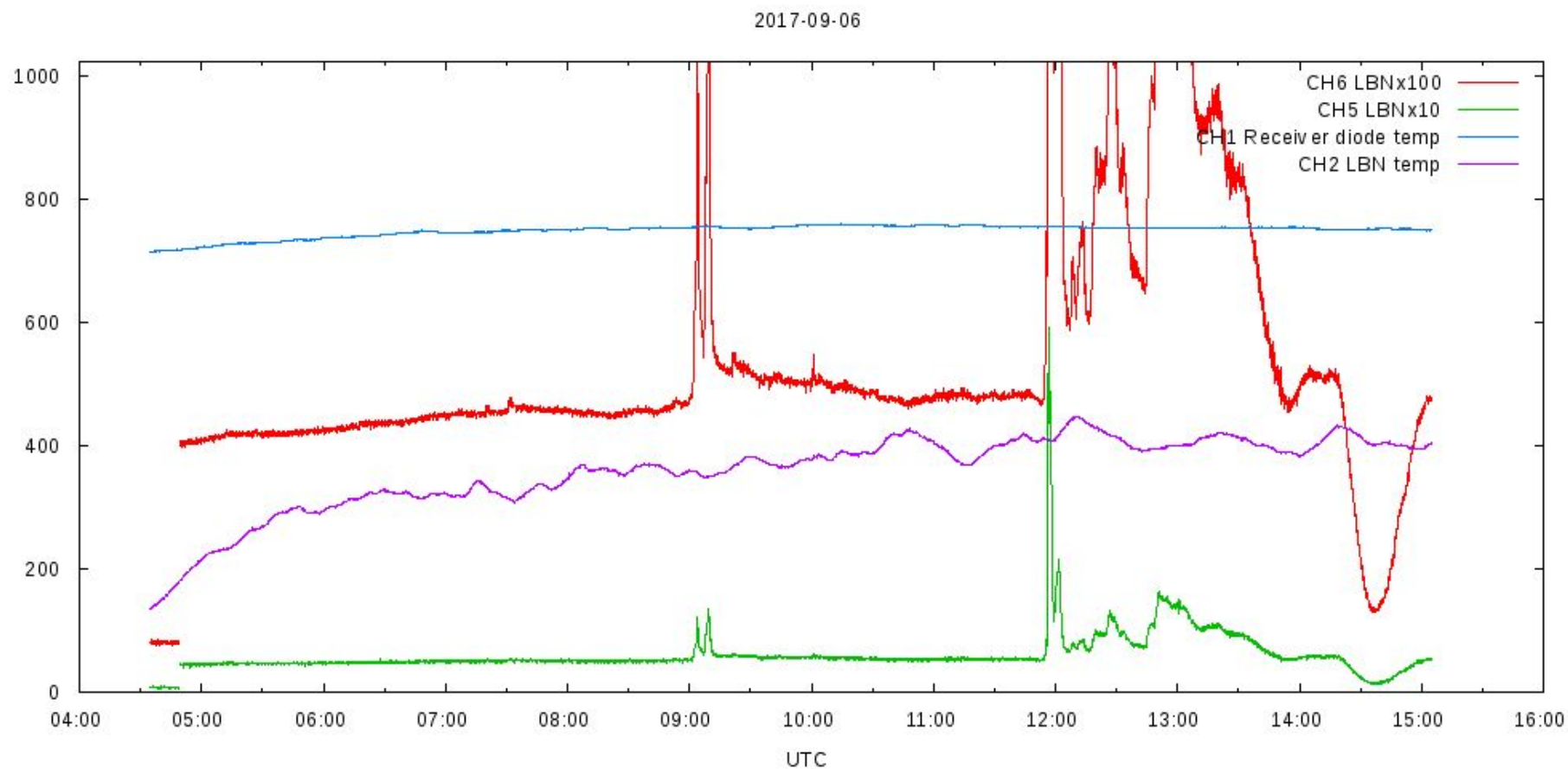


GOES Xray Flux 13.5.2013



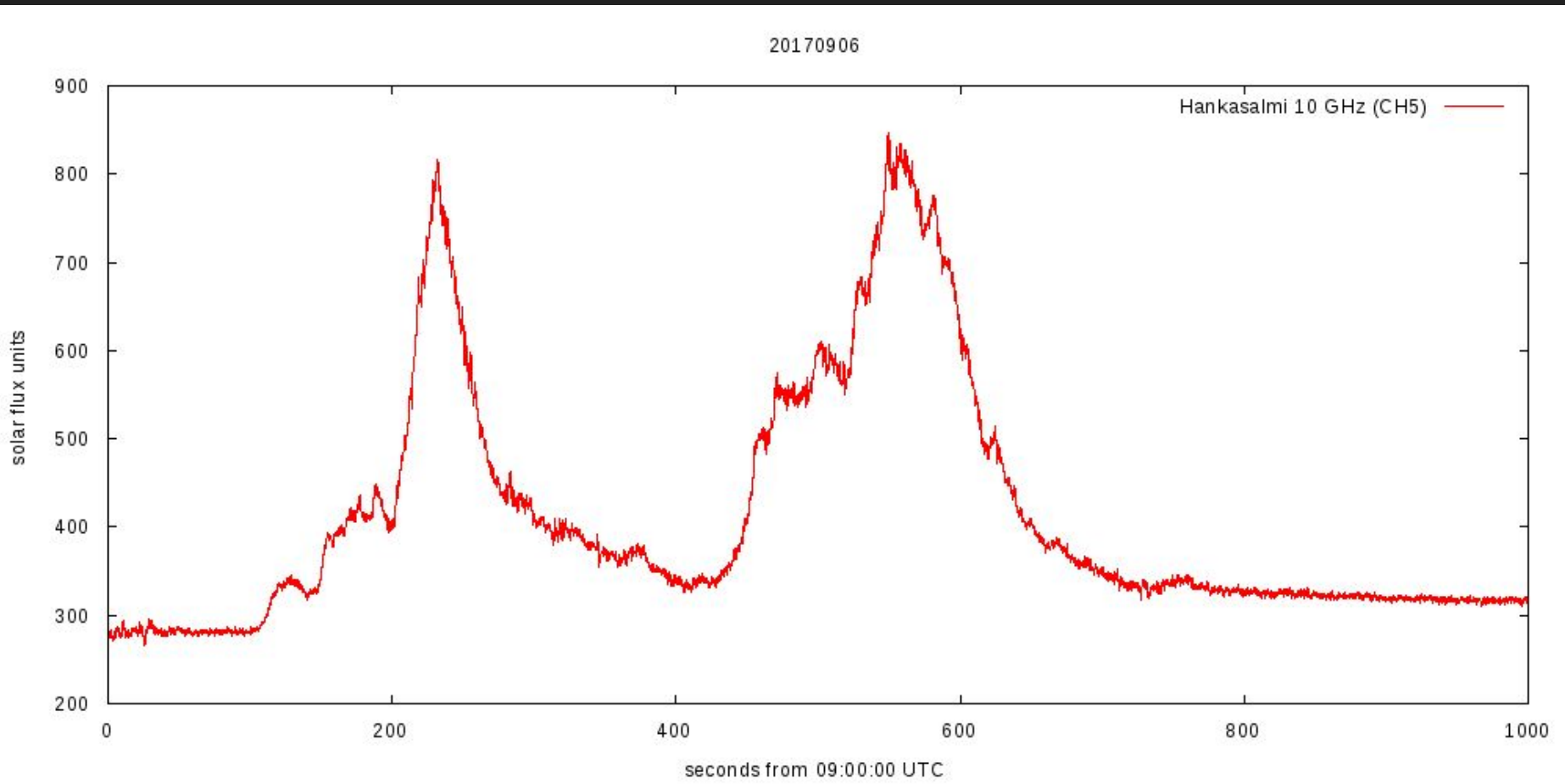
6.9.2017

Todella suuri flare-purkaus Auringossa! X-ray Class: **X9.3**. Pilkkuryhmä 2673.



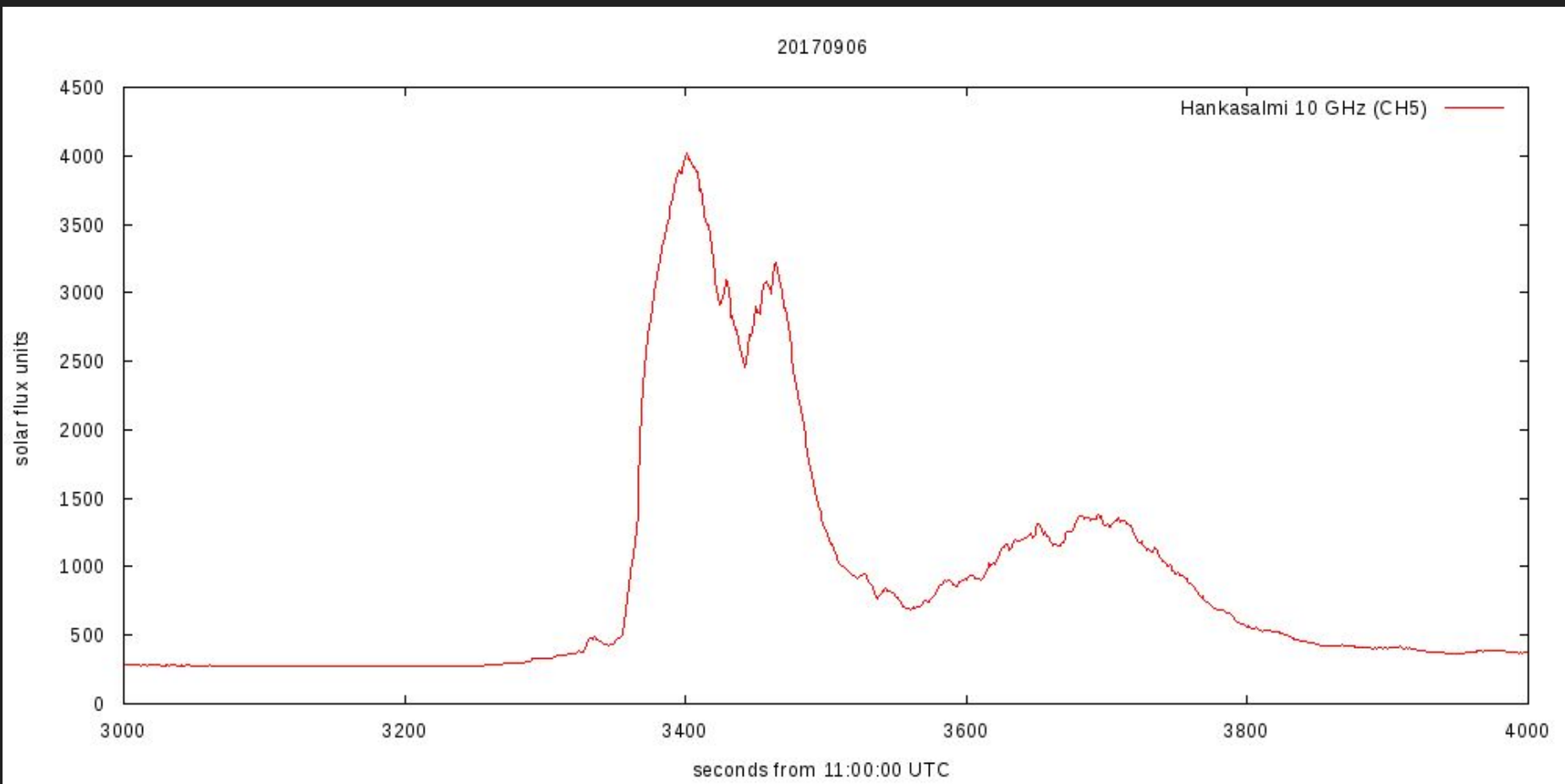
6.9.2017 klo 12.02

Todella suuri flare-purkaus Auringossa! X-ray Class: **X9.3**. Pilkkuryhmä 2673.

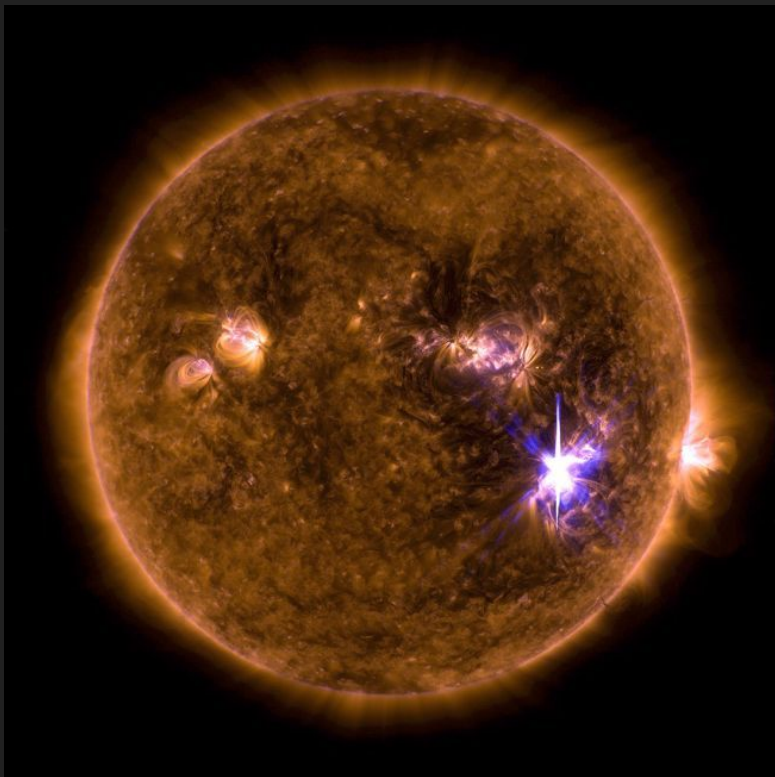


6.9.2017 klo 15.02

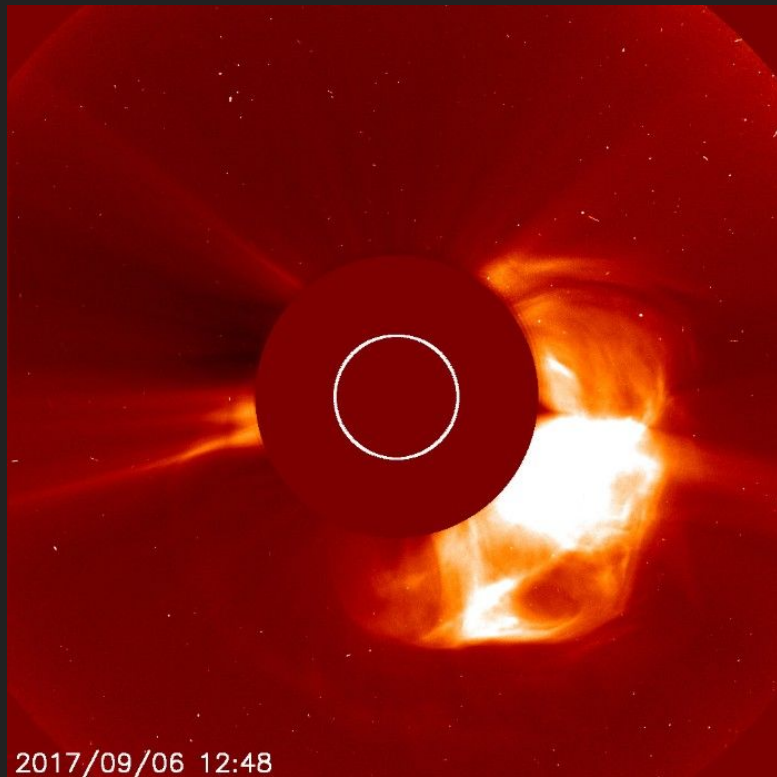
Todella suuri flare-purkaus Auringossa! X-ray Class: **X9.3**. Pilkkuryhmä 2673.



Purkaus avaruudesta



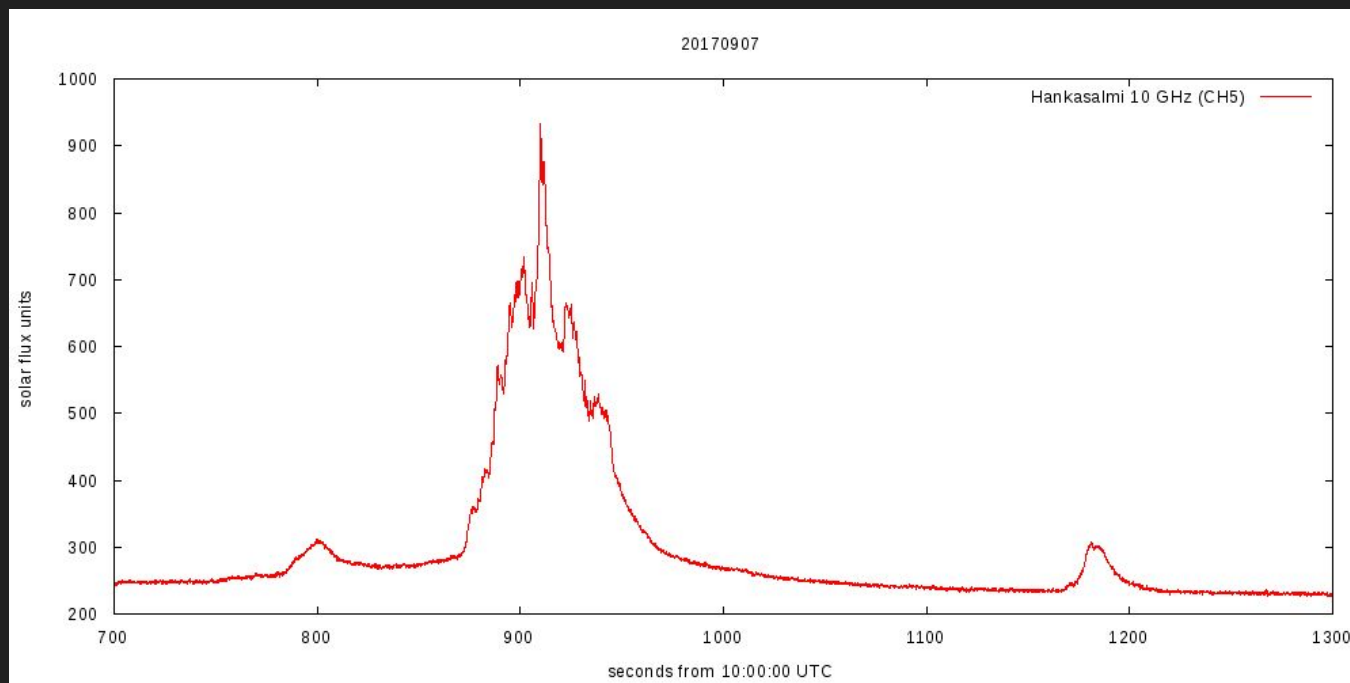
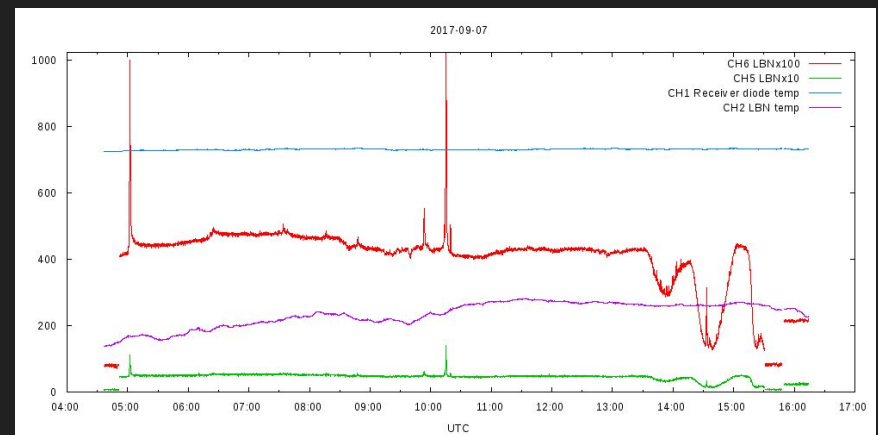
SDO



SOHO

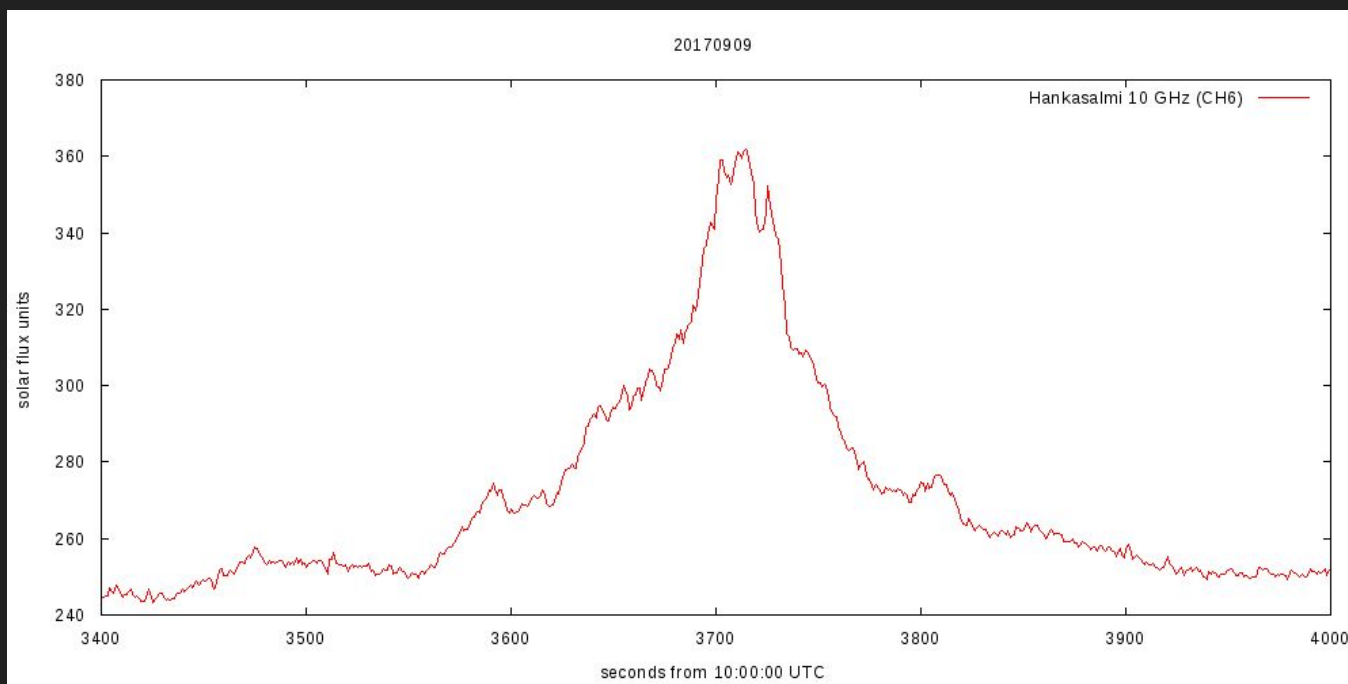
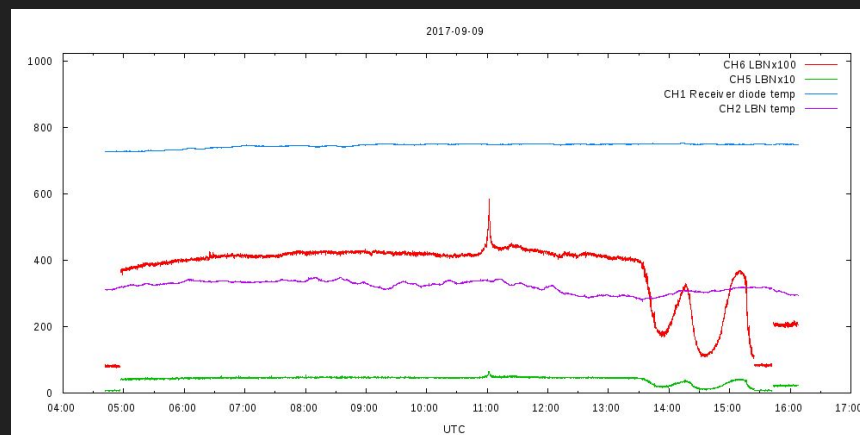
7.9.2017 klo 13.15

Päivän toinen suuri flare-purkaus.
Röntgenluokitus M7.3,
pilkkuryhmä 2673.

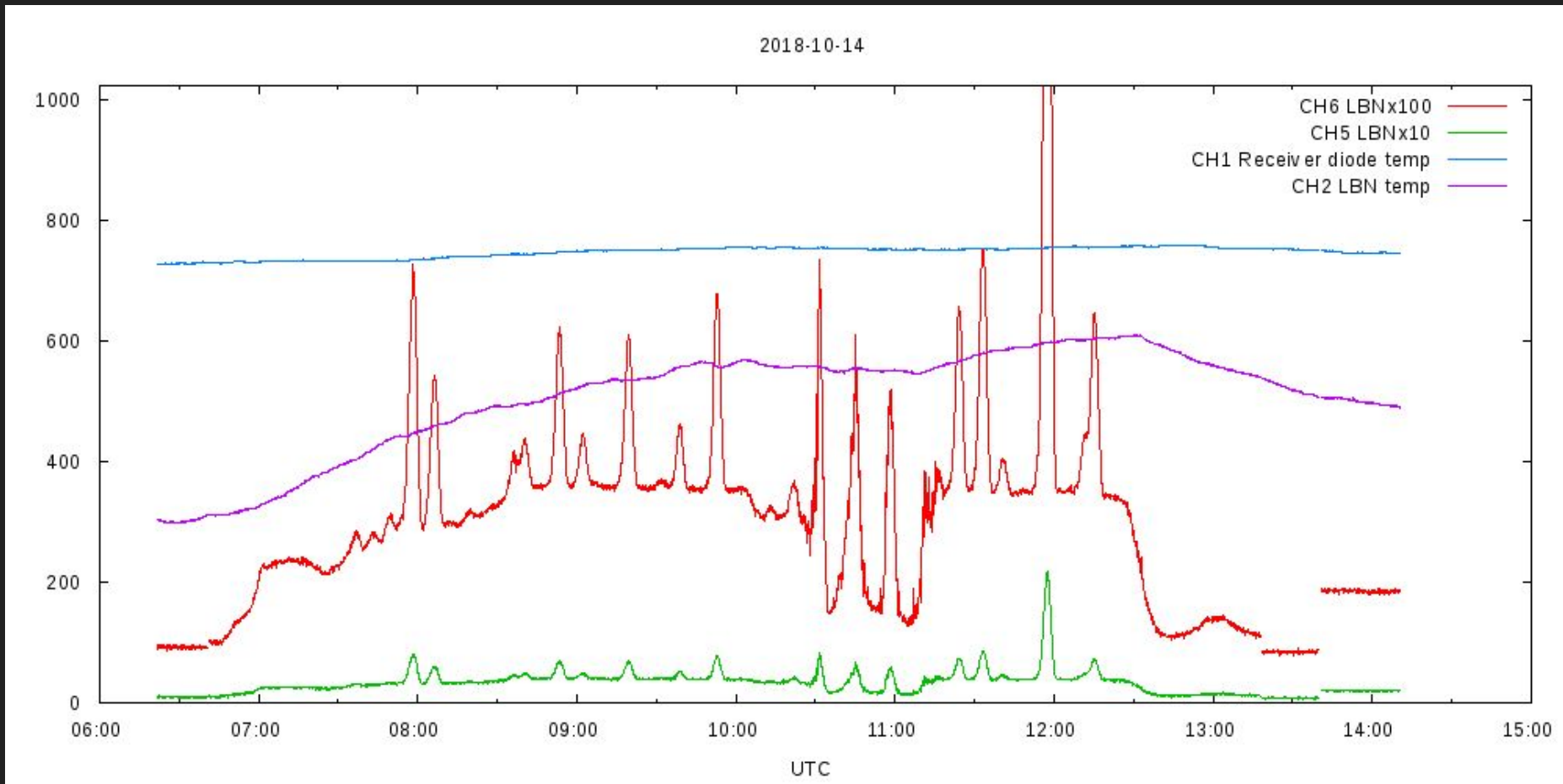


9.9.2017 klo 14.04

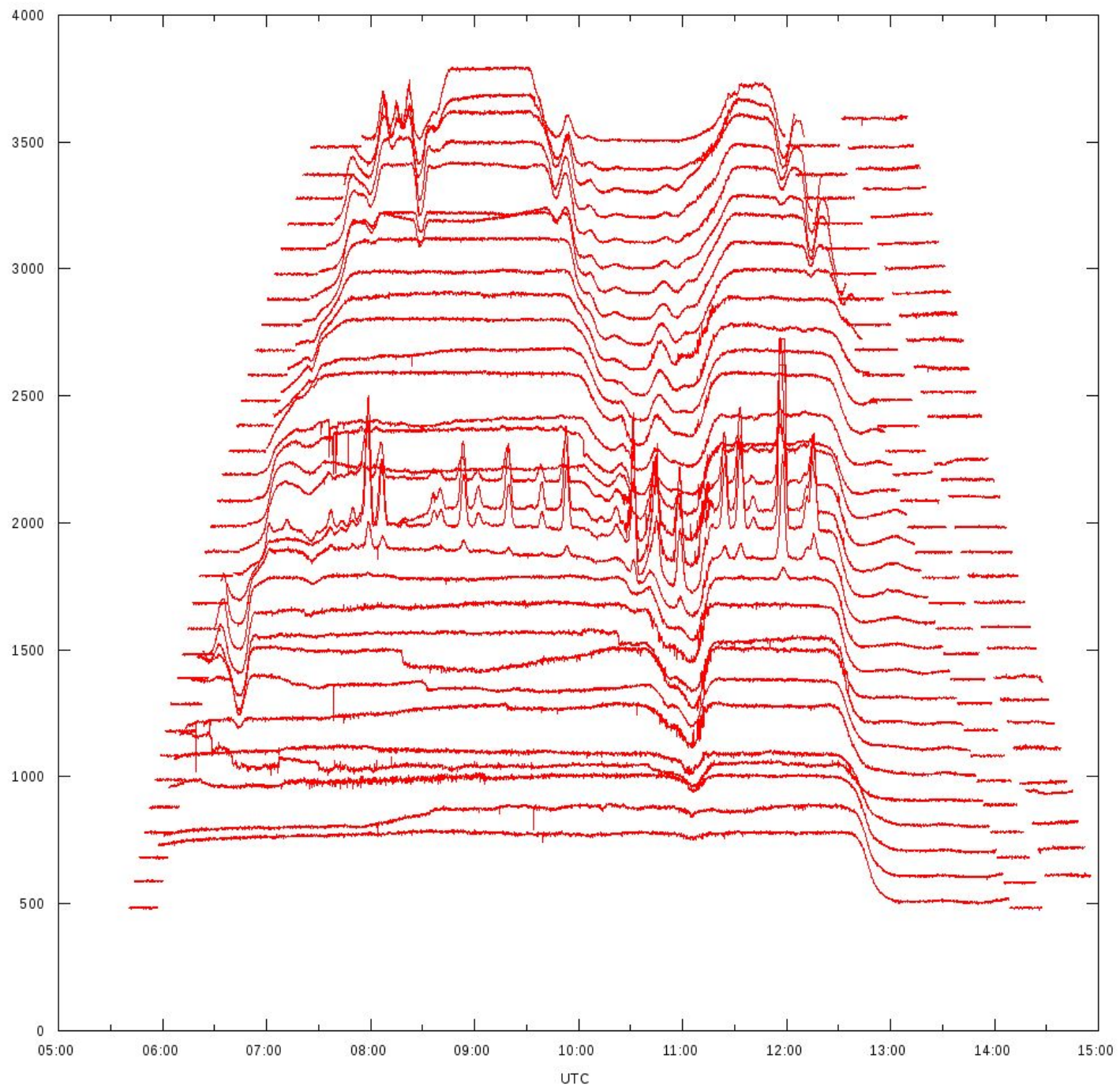
Röntgenluokitus M3.7,
pilkkuryhmä 2673



Aurinko ja geostationaariset satelliitit 14.10.2018



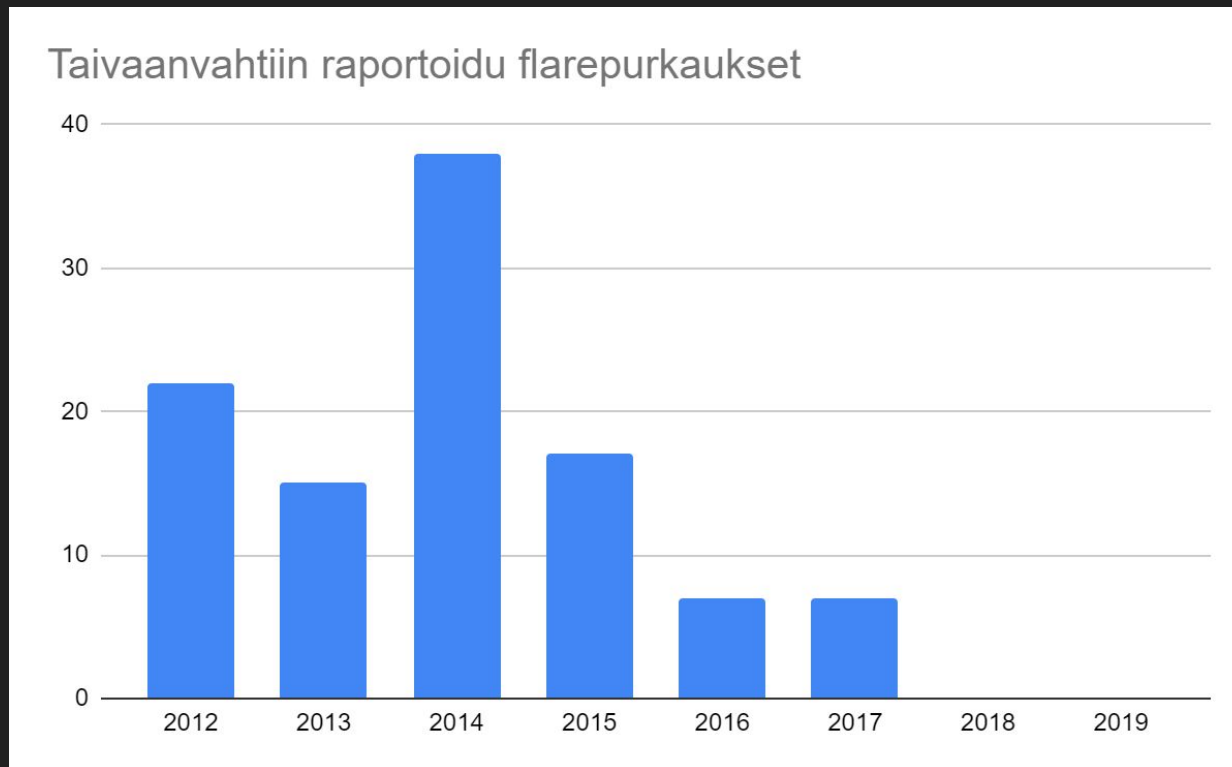
October 2018



2018 ja 2019

Vuosina 2018 ja 2019 Aurinkoa havaittiin Hankasalmen observatoriossa joka päivä maaliskuun alusta lokakuun loppuun.

Ei yhtään flarepurkausta!



Kysymyksiä?



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