

SID Monitoring in Slovakia

I. Dorotovič and T. Pintér

Slovak Central Observatory, Komárňanská 134, SK-94701 Hurbanovo, Slovak Republic; E-mail: ivan.dorotovic@suh.sk / suh@suh.sk

ABSTRACT

This contribution presents the Slovak SID monitoring network. One SuperSID monitor kindly provided by the Stanford University in the frame of the ISWI SID monitor network is installed in the Slovak Central Observatory in Hurbanovo and other is being installed in the Astronomical Observatory in Rimavska Sobota. Moreover, there are several SID monitors constructed by R. Slošiar (Bojnice) and J. Karlovsky (Hlohovec) operated in Bojnice (<http://195.160.182.241/page/rudy/>), Hlohovec (<http://karlovsky.info/sid/temphtml.htm>), Hurbanovo (<http://www.suh.sk/skypipedata.htm>), and Partizanske (<http://195.160.182.241/page/>). Results on registration of solar flares are presented as well.

1. INTRODUCTION

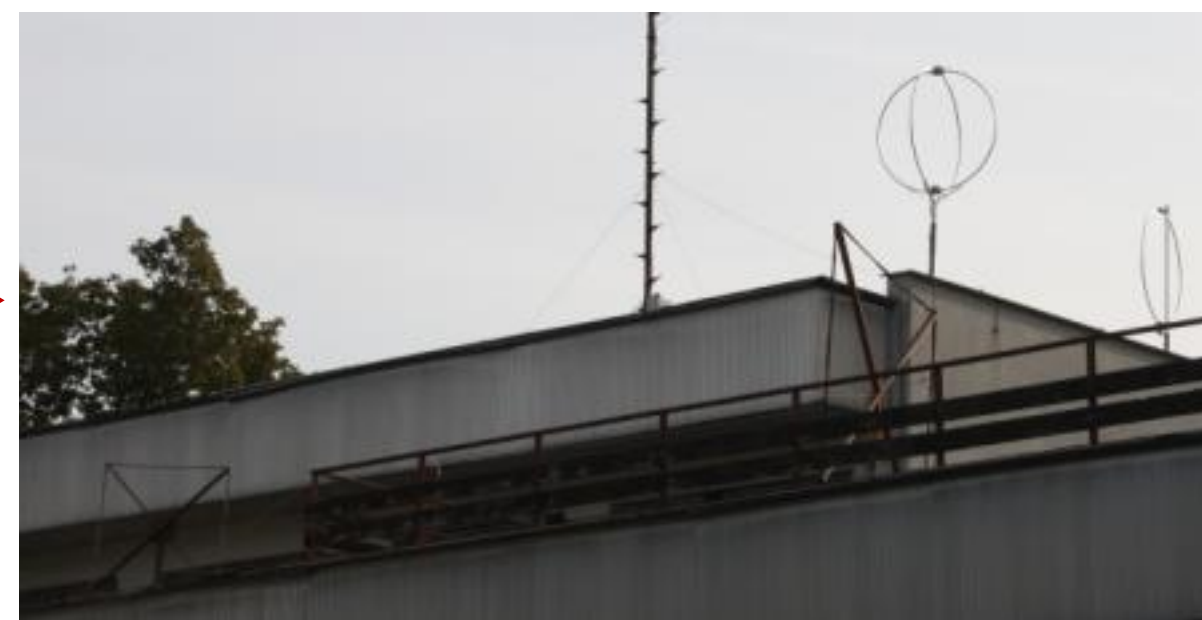
Introduction and detailed information to SID (Sudden Ionospheric Disturbances) Monitor can be found e.g. at Stanford Solar Center (<http://solar-center.stanford.edu/SID/sidmonitor/>) or at AAVSO website (<http://www.aavso.org/solar-sids>).

2. SID MONITORING NETWORK IN SLOVAKIA

• Indirect detection of solar flares: J. Karlovský (Hlohovec) a R. Slošiar (Bojnice) constructed their own SID monitors, which are installed in Bojnice and in the Astronomical Observatories Hlohovec, Hurbanovo, and Partizánske. J. Karlovský constructed also one SuperSID monitor.

SID monitoring – real-time data:

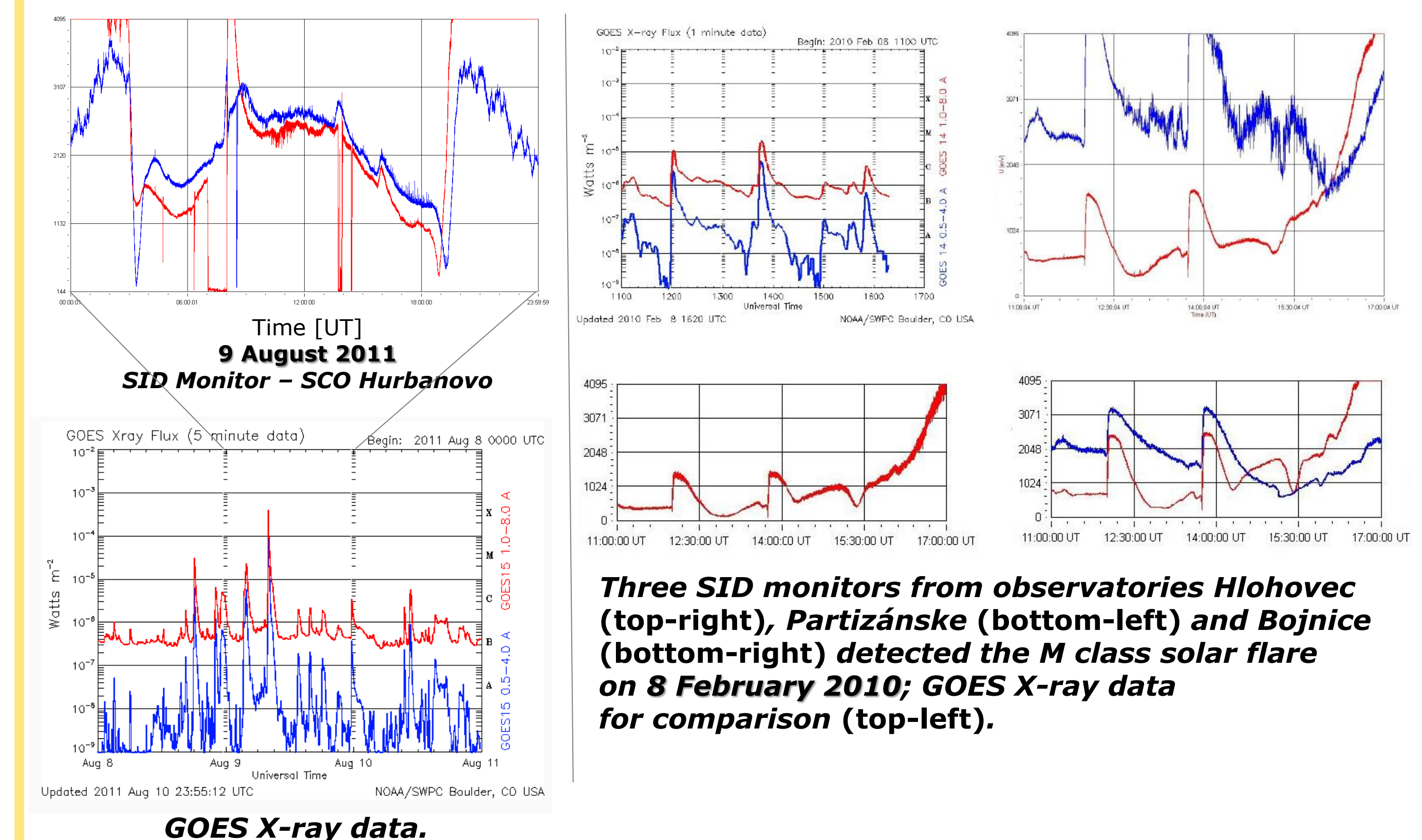
- Bojnice <http://195.160.182.241/page/rudy/>
- Hlohovec <http://karlovsky.info/sid/temphtml.htm>
- Hurbanovo <http://www.suh.sk/skypipedata.htm>
- Partizánske <http://195.160.182.241/page/>
- Roztoky no real-time data available, yet



SuperSID monitoring:

In the Slovak Central Observatory (SCO) Hurbanovo are also installed other SID monitors and one SuperSID monitor (this one in the frame of the ISWI program) – real-time data will be available soon. Another SuperSID monitor is being installed in the Astronomical Observatory in Rimavská Sobota

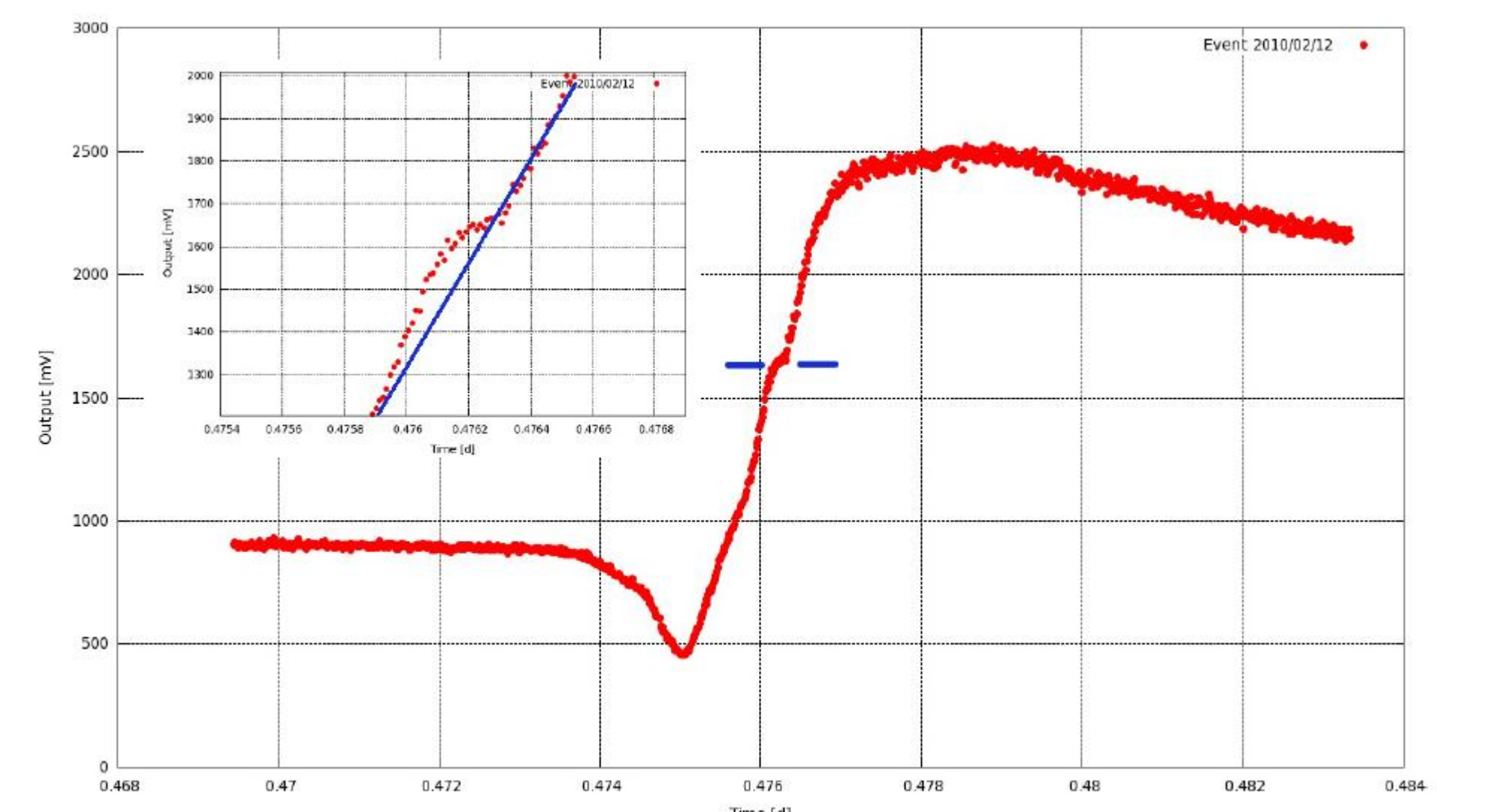
4. DETECTION OF SOLAR FLARES



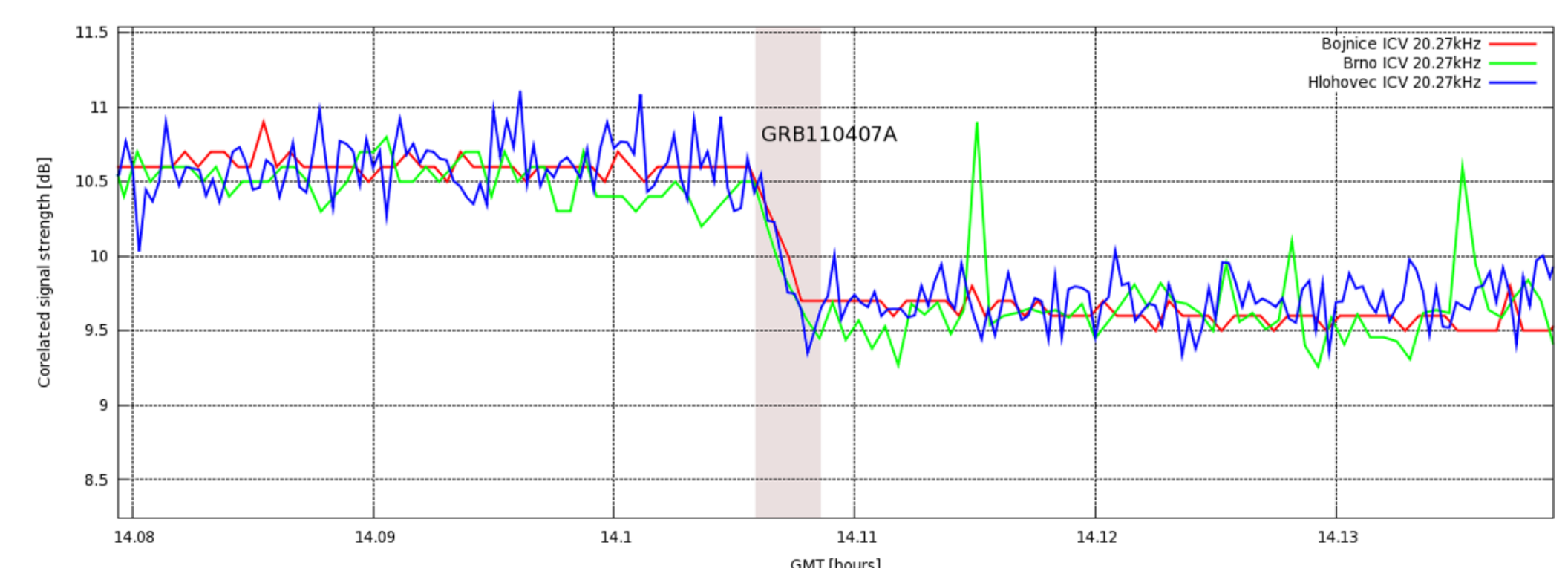
Three SID monitors from observatories Hlohovec (top-right), Partizánske (bottom-left) and Bojnice (bottom-right) detected the M class solar flare on 8 February 2010; GOES X-ray data for comparison (top-left).

5. DETECTION OF GAMMA RAY BURSTS

SID monitor is sensitive enough to detect such faint ionospheric events like Gamma Ray Bursts (GRBs). SID monitor network can eliminate noise coming from different sources mostly relatively close to SIDmonitor antenna, like close factories, electronics devices or for example neon light tubes. Three SID monitors (Partizánske, Hlohovec, Rudy BASE Bojnice) detected small disturbance in the middle of a solar flare ionospheric response on 12 February 2010.



This detection clearly shows how important is SID monitor network and how sensitive it can be. We already have four SID monitor sites in Slovakia, other SID monitors are installed in the Czech Republic (Brno, Ondřejov). Detailed information on detection of GRBs was published by Hudec et al. (2010) and Slošiar et al. (2011). Another example of GRB detection can be found in Kocka et al. (2011).



Acknowledgements

The authors are grateful to the Stanford Solar Center and the Society of Amateur Radio Astronomers (SARA) for providing two SuperSID monitors for installation in Slovakia.

REFERENCES

- Hudec, R., Spurny, M., Krizek, M., Pata, P., Slošiar, R., Rerabek, M.; Klima, M.: 2010, Detection of GRBs and OTs by All-Sky Optical and SID Monitors, *Advances in Astronomy*, article id. 428943, 10.1155/2010/428943.
- Slošiar, R., Hudec, R., Kocka, M., Marko, R., Zátka, M.: 2011, Indirect detections and analyses of GRBs by ionospheric response: toward a SID-monitor network, *GAMMA RAY BURSTS 2010*. AIP Conference Proceedings, Volume 1358, pp. 393-396.
- Kocka, M.; Slošiar, R.; Karlovsky, V.; Marko, R.; Karlovsky, J.: 2011, GRB 110407A: VLF observations on 20.27kHz., *GRB Coordinates Network, Circular Service*, 11914.



3. ANTENNAS AND SID MONITORS

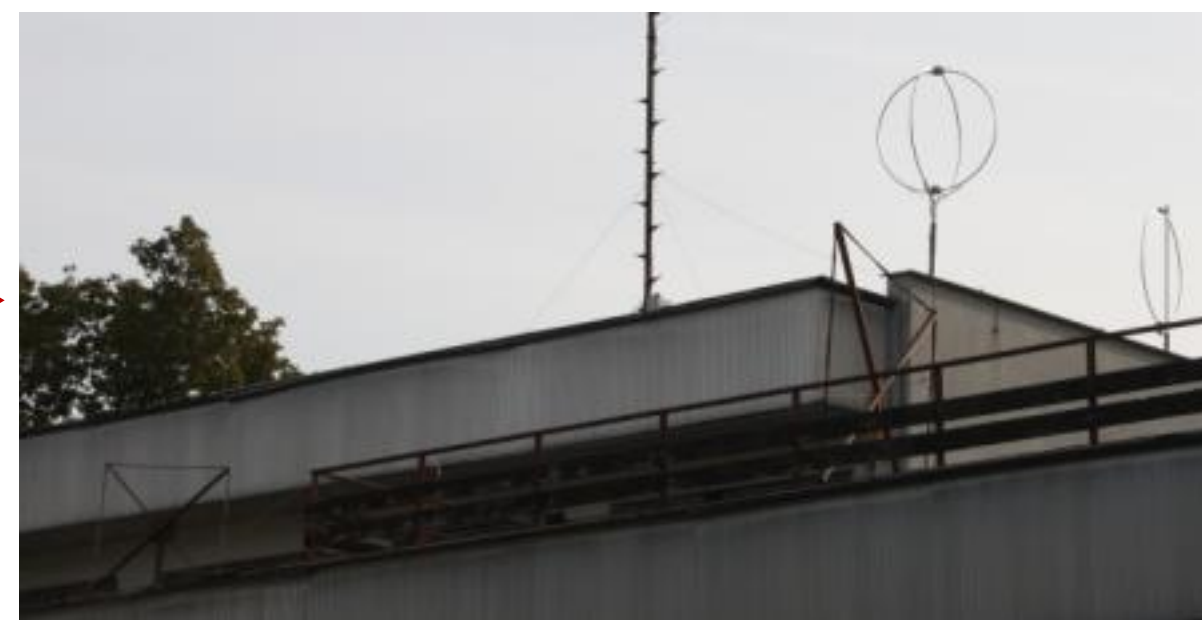
Introduction and detailed information to SID (Sudden Ionospheric Disturbances) Monitor can be found e.g. at Stanford Solar Center (<http://solar-center.stanford.edu/SID/sidmonitor/>) or at AAVSO website (<http://www.aavso.org/solar-sids>).

2. SID MONITORING NETWORK IN SLOVAKIA

• Indirect detection of solar flares: J. Karlovský (Hlohovec) a R. Slošiar (Bojnice) constructed their own SID monitors, which are installed in Bojnice and in the Astronomical Observatories Hlohovec, Hurbanovo, and Partizánske. J. Karlovský constructed also one SuperSID monitor.

SID monitoring – real-time data:

- Bojnice <http://195.160.182.241/page/rudy/>
- Hlohovec <http://karlovsky.info/sid/temphtml.htm>
- Hurbanovo <http://www.suh.sk/skypipedata.htm>
- Partizánske <http://195.160.182.241/page/>
- Roztoky no real-time data available, yet



SuperSID monitoring:

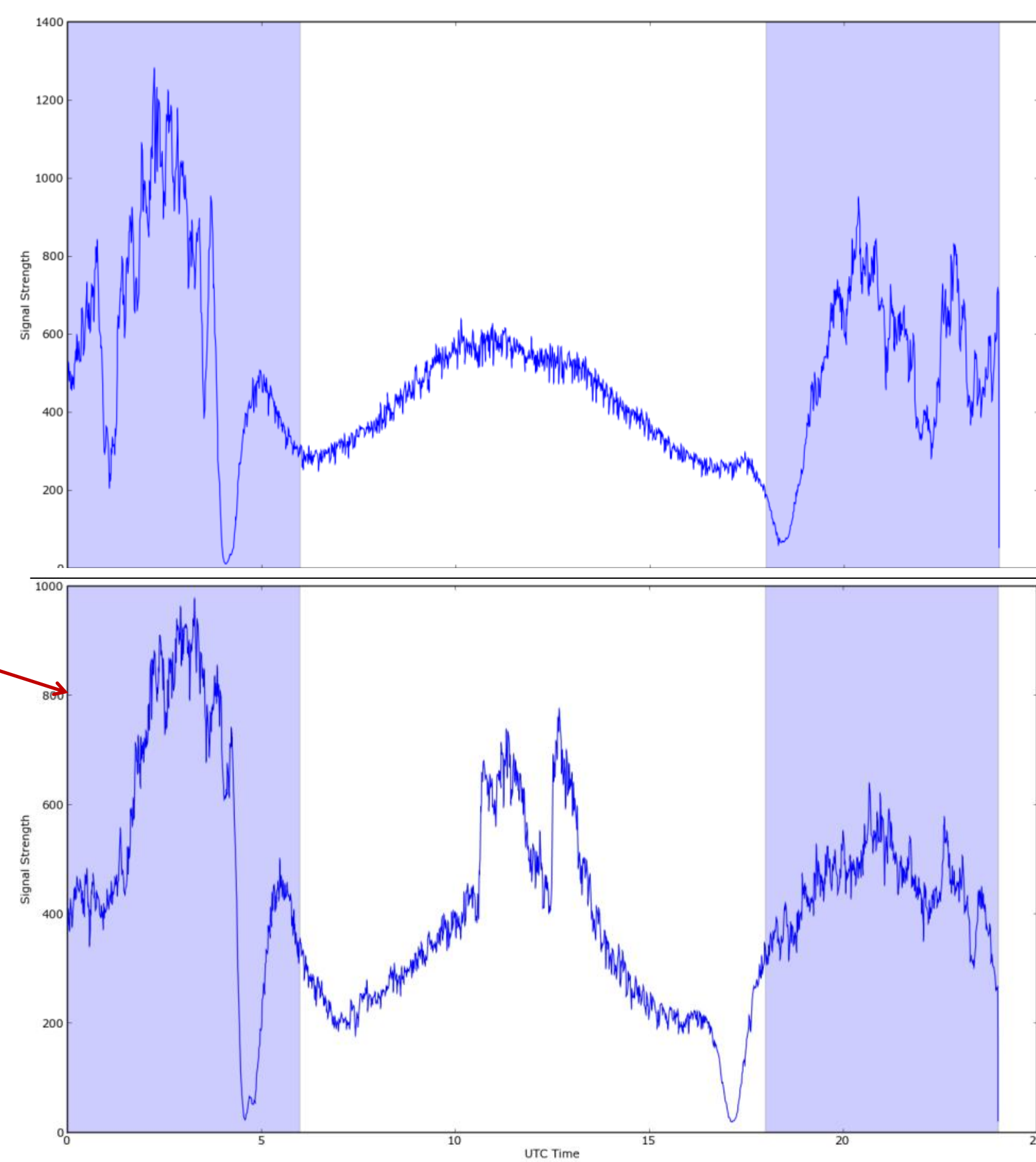
In the Slovak Central Observatory (SCO) Hurbanovo are also installed other SID monitors and one SuperSID monitor (this one in the frame of the ISWI program) – real-time data will be available soon. Another SuperSID monitor is being installed in the Astronomical Observatory in Rimavská Sobota



Antenna of the SuperSID Monitor in Hurbanovo.

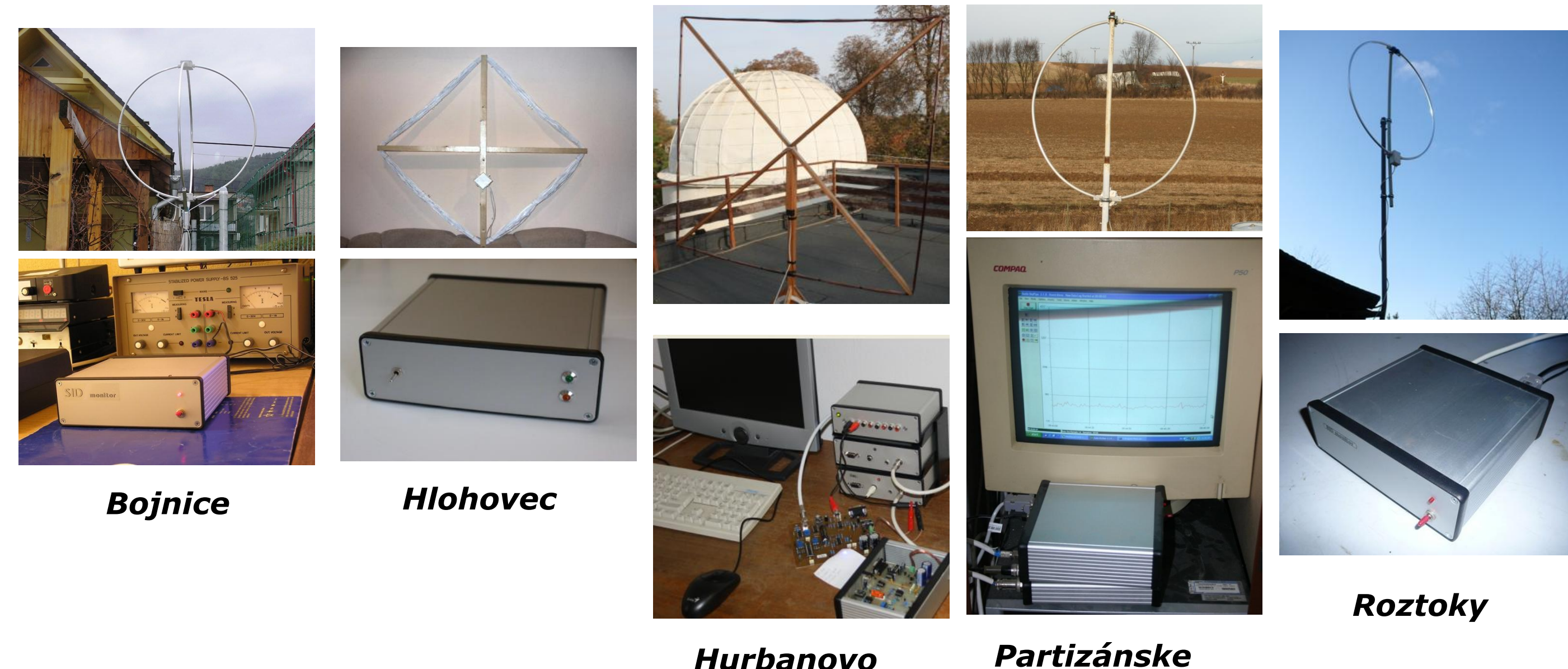


Antenna of the SuperSID Monitor in Rimavská Sobota.



Typical ionospheric behaviour – a day without solar flare activity (top panel) versus solar flare activity day behaviour – 5 October 2011 (bottom panel).

3. ANTENNAS AND SID MONITORS



Bojnice

Hlohovec

Hurbanovo

Partizánske

Roztoky