Solar Radio Spectrometer CALLISTO in Hurbanovo – first results

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Abstract
In December 2011 was installed in the Slovak Central Observatory in Hurbanovo a solar radio spectrometer CALLISTO in the frame of the ISWI (International Space Weather Initiative) program. The spectrometer registers solar radio radiation using a broadband antena in the range of frequencies from 45 to 870 MHz. This contribution presents the observing site of the instrument and the first results.

1. INTRODUCTION

e-CALLISTO is an acronym for extended Compact Astronomical Low-cost Low-frequency Instrument for Spectroscopy and Transportable Observatory. The receiver instrument itself (solar radio spectrometer) is called CALLISTO. CALLISTO was designed by Christian Monstein at ETH Zürich. Additional information on e-CALLISTO and CALLISTO can be found at: http://www.e-callisto.org/
http://www.reeve.com/Solar/e-CALLISTO/e-callisto.htm

2. CALLISTO IN HURBANOVO

CALLISTO eC50 was installed in the Slovak Central Observatory in Hurbanovo [N 47° 52′ 33.″28, E 18° 11′ 37.″93] on 17 December 2011. The instrument receives solar radio signal by using a log-periodic antenna CLP-5130-2N and a low-niose amplifier ZX60-33LN+.

Figure 1. A log-periodic antenna CLP-5130-2N for the CALLISTO in Hurbanovo.

Figure 2. CALLISTO instrument No. eC50 (left) with the amplifier ZX60-33LN+.

3. SOFTWARE INSTALLATION AND FIRST LIGHT OBSERVATION

All necessary software for recording the solar radio spectroheligrams of 15 minutes length and their uploading to the server at ETH in Zürich (Switzerland) was pre-installed before the visit of Ch. Monstein in Hurbanovo. On 17 December 2012 the instrument was set up, the software installation was checked and right at the same days we managed to observe a small radio burst as a first light observation.

Figure 3.Ckecking the software installation (I. Dorotovič).

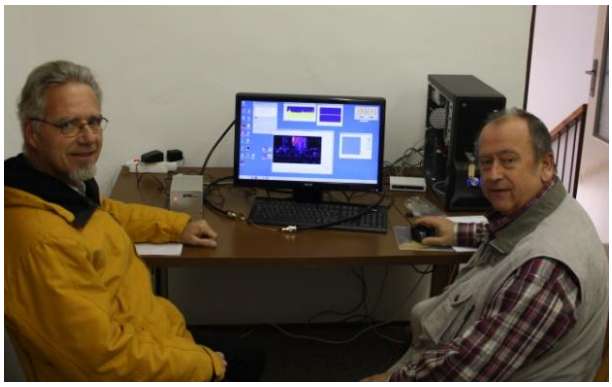

*Figure 4. Ch. Monstein (***left***) and T. Pintér after the first light observation.*

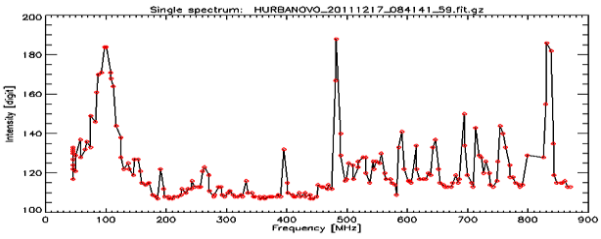

Figure 5. Radio frequency interference (RFI).

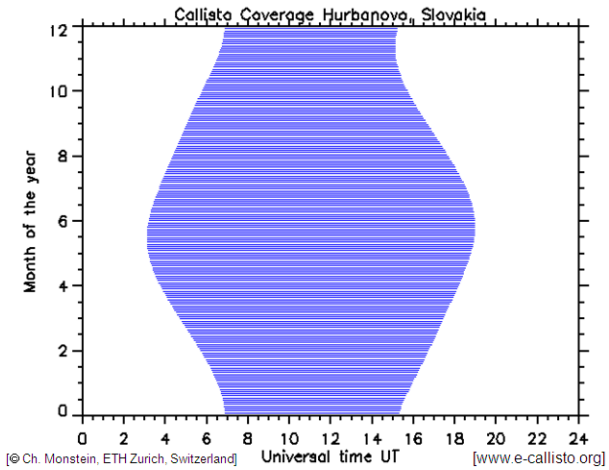

Figure 6.CALLISTO coverage in Hurbanovo.

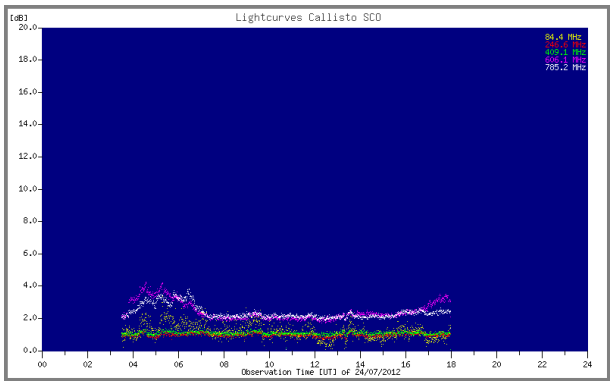

Figure 7. Lightcurves – SCO Hurbanovo.

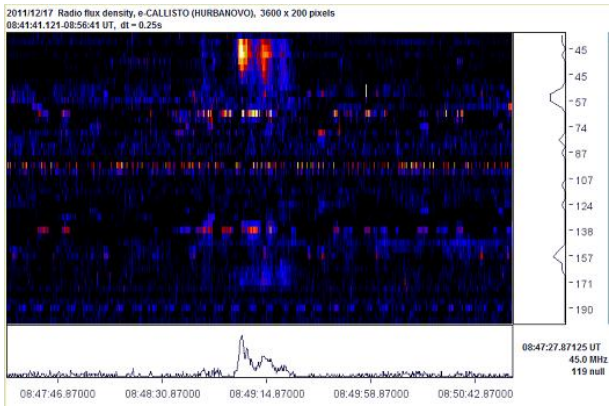

Figure 8.First light observation on 17 December 2011 at 08:49 UT.

4. SOME SELECTED EVENTS

We observed several solar radio burst during first 6 months of opeartional use of CALLISTO in Huranovo. We selected two type III burst as a sample events:

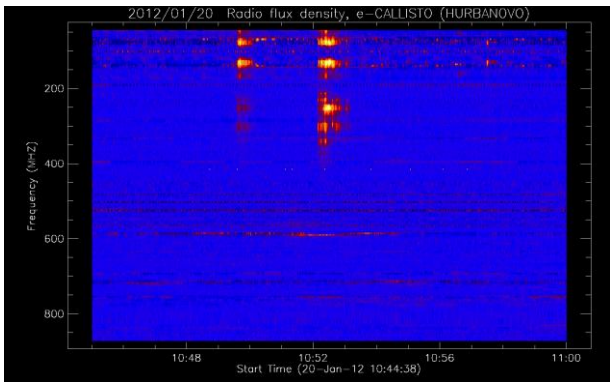

Figure 9. Radio bursts of type III (electrons) on 20 January 2012 between 10:49 and 10:53 UT.

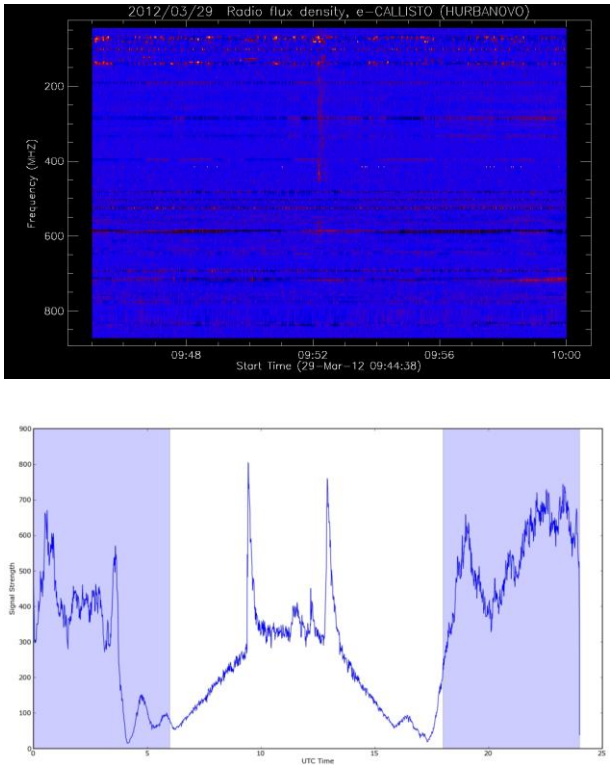

Figure 10. Radio burst of type III (electrons) on 29 March 2012 at 9:52 UT (*top panel*) and the SuperSID monitor record from the same day.

5. FUTURE PLANS

We plan to install the antenna on a stable stand and we will use rotator for the antenna for better sensitivity during morning and evening events. A tracking controller has been designed and manufactured for automatic tracking of the antenna during an observing day.

Acknowledgements

The authors are grateful to Christian Monstein from the ETH in Zürich (Switzerland) for providing the CALLISTO instrument in the frame of the ISWI instrument deployment program and for his kind assistance in installing the software and the CALLISTO in Hurbanovo. We thank also to the staff of the Optical and Mechanical Workshop of the SCO for dedicated work during installation and test operation of the equipment.