Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

University of Applied Sciences
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CALLISTO status report/newsletter #61

New Callisto station operational in Denmark

Recently, a new long wavelength station in Denmark has been set into operation at the Technical University of Denmark. It is a dual linear polarization frequency agile solar radio burst spectrometer based on two Callisto spectrometer.

Fig. 1: LWA installed at an existing observatory site of the university. Frequency range 45 MHz – 100 MHz

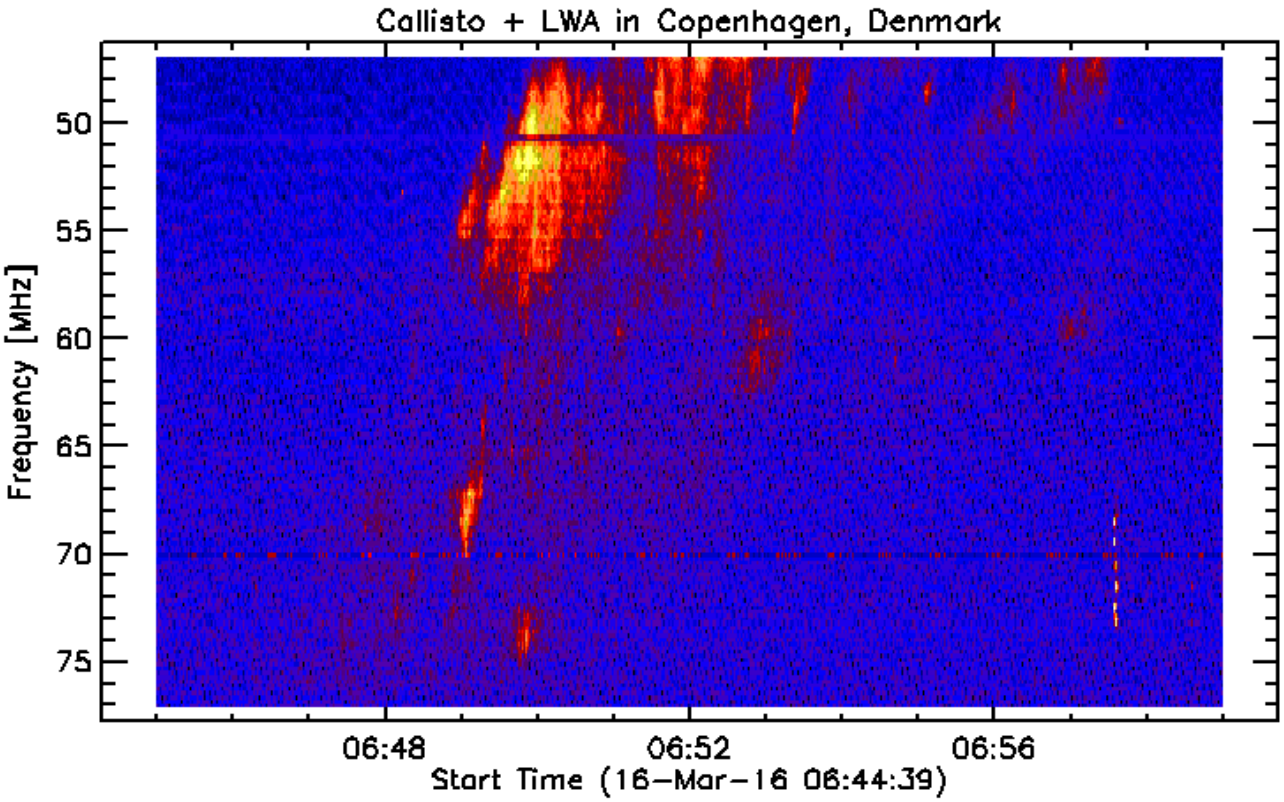

Fig. 2: A nice type II burst observed with LWA and Callisto in Denmark (linear polarization).

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New Callisto station operational in Greenland

Just this week a new long wavelength station in Greenland has been set into operation. It is a dual circular polarization frequency agile solar radio burst spectrometer based on two Callisto.
Just north of the Arctic Circle and 100 km inland from the west coast of Greenland lies a research facility dedicated to studying the polar upper atmosphere. For historical reasons, this research station is known around the world as the Sondrestrom Upper Atmospheric Research Facility in Kangerlussuaq, Greenland. The facility is operated by SRI International in Menlo Park, California, under the auspices of the U.S. National Science Foundation and in joint cooperation with Denmark's Meteorological Institute. The facility has been operating in Greenland since 1983 and continues to be in high demand by the scientific communities. This facility is host to more than 20 instruments, the majority of which provide unique and complementary information about the arctic upper atmosphere. Together these instruments advance our knowledge of upper atmospheric physics and determine how the tenuous neutral gas interacts with the charged space plasma environment. The suite of instrumentation supports many disciplines of research; from plate tectonics to aurora physics and space weather. The facility instrumentation covers the electromagnetic spectrum while the data results span the spectrum of polar research. The center-

piece instrument of the facility is an L-band incoherent scatter (IS) radar with a 32 m fully steerable antenna. The IS radar technique is a powerful tool capable of measuring range-resolved ionospheric and atmospheric parameters simultaneously from the ground to the outer reaches of our atmosphere. Use of a steerable antenna allows spatial coverage in both latitude and longitude. Data from the facility are used by hundreds of scientists annually. Dozens of scientists, engineers, and students visit the site each year to install hardware, implement enhancements to collocated instruments, and collect data in real time in multi-instrument campaigns. Access to the facility can be arranged by SRI for qualified scientific users. Information regarding visits to Sondrestrom and a detailed facility description are available on this website (see Visiting Sondrestrom). Further information and assistance with siting additional instruments can be provided by SRI (http://isr.sri.com/about.html).
The two linear polarization are converted into two circular polarization LHCP and RHCP to identify circular polarized solar radio bursts. The frequency range of Callisto has been expanded by an up-converter from 10 MHz upwards. Due to the nearby international airport we decided only to observe up to 110 MHz to avoid rfi from air-communication.

Fig. 3 (left): Kristoffer operating Callisto in the observatory of existing instruments like magnetometers and an all sky camera.

Fig. 4 (right): from left to right: Christian Monstein ETH, LWA, Kristoffer LEER DTU. Outside temperature was about -20°C, therefore full layer of cloths.

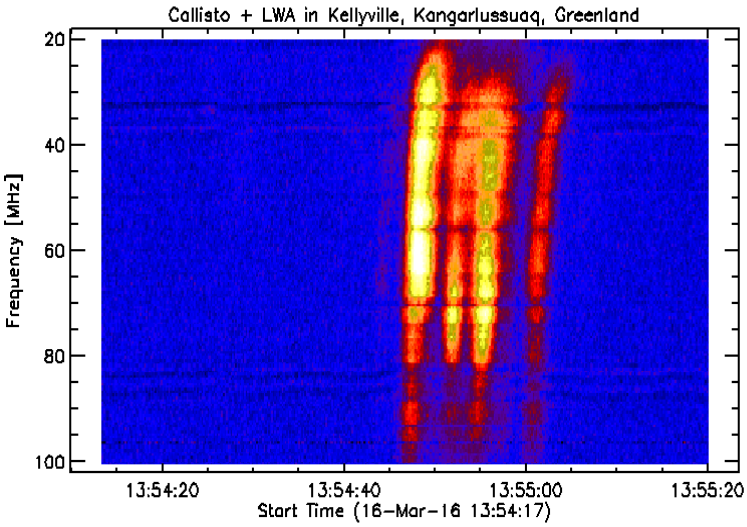

Fig. 5: First light, a small group of type III bursts. The burst is very clear on a rfi-free background. We had a big concern that the ionospheric radar may interfere with our observations, but it's not the case. This station is is one of very very few which is able to observe in the FM-range, there is no FM here at all.

Callisto station upgraded in Bulgaria

The station at Rhozen observatory in Bulgaria has been upgraded with a HAM rotator Yaesu G-5500, while the antenna is a commercial CLP-5130-1N.

Fig. 5: Kamen Kozarev at the antenna location.
Further information through: kamen.kozarev@gmail.com

Update on Callisto Malaysia by Zety Sharizat

Recently, we went to the National Space Center to check the CALLISTO system. The CALLISTO system has been re-allocated to the antenna farm. But the data still cannot be provided to the CALLISTO network because of internet cable or WiFi still not connected to the site.

So far, I have 4 Master students that will use the CALLISTO system. The title of their masters studies are:

1. Investigation of Bremsstrahlung , Non-Thermal Radiation and Langmuir Waves in solar radio burst type III- Marhana
2. Effect of The Moreton Waves On The Structure Of Coronal Mass Ejections Events (CMEs) Based On Solar Radio Burst Type II Characteristics- Dayah
3. Effect Of The Magnetic Re-Connection On The Structure Of Solar Flares And Coronal Mass Ejections Events Based On Solar Radio Burst Type II And III
4. Investigation on the Evolution of Unstable 'Beta-Gamma' Magnetic Fields of Active Region detected by Solar Radio Burst.

I have also 2 grants for this CALLISTO projects. The title of the grants are:
1. OBSERVING THE EFFECT OF THE MAGNETIC RE-CONNECTION ON THE STRUCTURE OF SOLAR FLARES AND CORONAL MASS EJECTIONS EVENTS BASED ON SOLAR RADIO BURST TYPE II AND III
2. EFFECT OF THE MORETON WAVES ON THE STRUCTURE OF CORONAL MASS EJECTIONS EVENTS (CMES) BASED ON SOLAR RADIO BURST TYPE II CHARACTERISTICS

AOB

- In case you plan to publish a paper based on e-Callisto data, please invite the observer and me as the PI of the network for co-authorship. This, according to the UN/ISWI resolution addressed during the last UN/Japan workshop at Fukuoka university. We are working on a document regarding data policy which will be published soon (Fung Shing NASA). In the meantime the document has been accepted during the ISWI steering committee meeting in Vienna.

- CALLISTO or Callisto denotes to the spectrometer itself while e-Callisto denotes to the worldwide network.

- General information and data access here: http://e-callisto.org/

- Callisto software does operate also under Win 8.1 and Win 10

- After the successful SCOSTEP/ISWI International Space Science School (ISSS) in Indonesia, Kenya, and Peru, we are organizing the next school in Sangli, Maharashtra, India, during November 7 - 17, 2016 (Nat Gopalswamy).

- e-Callisto data are hosted at Fachhochschule Nordwestschweiz (University of applied sciences FHNW) in Brugg/Windisch, Switzerland. Process control, user communication and scripts are conducted at institute for Astronomy, ETH Zurich.

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