Solar Radio Astronomy at IRSOL & FHNW

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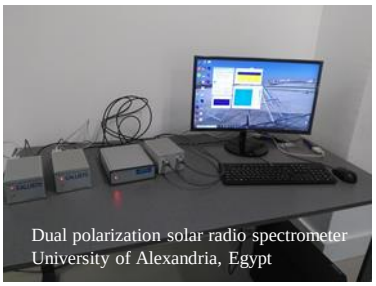
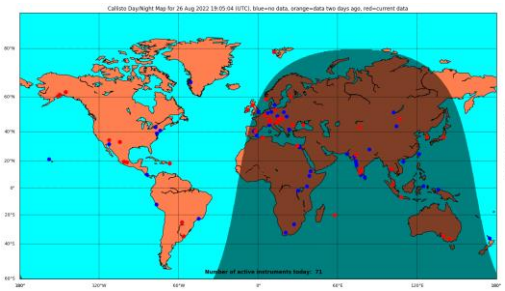
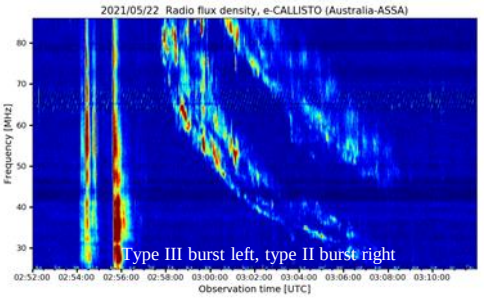
Contribution to IHY2007 and ISWI: Frequency Agile Radio Spectrometer CALLISTO

Worldwide > 200 instruments to observe dynamic solar radio bursts
Goal: understanding transient phenomenon in the solar corona


Dual polarization solar radio spectrometer
University of Alexandria, Egypt





Type III burst left, type II burst right

The CALLISTO spectrometer is a programmable heterodyne receiver built in the framework of IHY2007 and ISWI to support universities and institutes in developing countries. The instrument operates between 45 and 870 MHz using a modern, commercially available broadband cable-TV tuner CD1316 having a frequency resolution of 62.5 KHz. The data obtained from CALLISTO are FIT-files with up to 400 frequencies per sweep. The data are transferred via a RS-232 cable to a computer and saved locally. Time resolution is 0.25 sec at 200 channels per spectrum (800 pixels per second). The integration time is 1 ms and the radiometric bandwidth is about 300 KHz. The overall dynamic range is larger than 50 dB. For convenient data handling several IDL- and Python-routines were written.

Many CALLISTO spectrometers have already been deployed worldwide. Through the IHY/UNBSSI and ISWI instrument deployment program, CALLISTO is able to continuously observe the solar radio spectrum for 24h per day through all the year. All Callisto spectrometers together form the e-Callisto network. Callisto in addition is dedicated to do radio-monitoring within its frequency range with 13'200 channels per spectrum. The frequency range can be expanded to any range by switching-in a heterodyne up- or a down-converter. The data archive is hosted at Fachhochschule Nordwestschweiz (FHNW) and the network is operated from IRSOL, Switzerland. More information and data access here: https://e-callisto.org

Instruments distributed all over the world


Handover of a Callisto spectrometer to Timbul Manik of Space Science Center in Bandung, Indonesia during an ISWI/MAGDAS school in Indonesia.


Physics students on the roof of the University Kebangsaan Malaysia after erecting the logarithmic periodic dipole antenna.


Installation of a logarithmic periodic dipole antenna array (LPDA) at IRSOL.