

MASER: A Science Ready Toolbox for Low Frequency Radio Astronomy

Wednesday, October 21, 2020 1:30 PM (10 minutes)

MASER (Measuring, Analysing and Simulating Radio Emissions) provides a comprehensive infrastructure dedicated to low frequency radio emissions (typically < 50 to 100 MHz). The four main radio sources observed in this frequency are the Earth, the Sun, Jupiter and Saturn. They are observed either from ground (down to 10 MHz) or from space (down to a few kHz). Ground observatories are more sensitive than space observatories and capture high resolution data streams (up to a few TB per day for modern instruments). Conversely, space-borne instruments can observe below the ionospheric cut-off (10 MHz) and can be placed closer to the studied object.

Several tools have been developed in the last decade for sharing space physics data. Data visualization tools developed by the **CDPP** (Centre de Données de la Physique des Plasmas, in Toulouse, France) and the University of Iowa (**Autoplot**) are available to display and analyse space physics time series and spectrograms. A planetary radio emission simulation software is developed in LESIA (**ExPRES**: Exoplanetary and Planetary Radio Emission Simulator). The **VESPA** (Virtual European Solar and Planetary Access) provides a search interface that allows to discover data of interest for scientific users, and is based on **IVOA** standards (astronomical International Virtual Observatory Alliance). The University of Iowa also develops **Das2** that allows to distribute data with adjustable temporal resolution.

MASER is making use of all these tools and standards to distribute datasets from space and ground radio instruments available from the Observatoire de Paris, the Station de Radioastronomie de Nançay and the CDPP deep archive. These datasets include Cassini/RPWS, STEREO/Waves, WIND/Waves, Ulysses/URAP, ISEE3/SBH, Voyager/PRA, Nançay Decameter Array (Routine, NewRoutine, JunoN), RadioJove archive, swedish Viking mission, Interball/POLRAD... MASER also includes a Python software library for reading raw data.

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Abstract

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