Observatoire de Paris
IHDEA 2020 Highlights

- Instrumental and data activity in Heliophysics
- Registration of resources in SPASE
- MASER tools and services
- VESPA and VESPA-Cloud
- Solar data (BASS2000)
- Radio data

Instrumental/data activity

- Instrumental activity + data management

- Observatoire de Paris (with support of CNRS and CNES) are leading Heliophysics instrumentation:
  - Solar-Orbiter/RPW (PI+science ground segment)
  - JUICE/RPWI (co-PI)
  - Nançay (many instruments, old ones + new ones)
  - new SID antenna in Meudon

- Observatoire de Paris *Open Science* policy:
  - Open data: 2 data centres (PADC in Paris and CDN in Nançay),
  - DOI on data collections, ORCID for persons
  - Standard community API, standard community metadata
  - Data management plan = support tool for science team and data centre
  - Participation to the European Open Science Cloud (EOSC)

New SPASE Resources

- See “Registering Resources from Observatoire de Paris and Nançay in SPASE/HPDE” (B. Cecconi)

- Reorganised Observatory/Instruments
  New Repositories
  Updated Persons

- NumericalData/DisplayData: ongoing work (+questions and discussion points)

MASER tools and services

- **Reference:** Cecconi, Baptiste, et al. 2020. "*MASER: a Science Ready Toolbox for Low Frequency Radio Astronomy.*" Data Science Journal 19 (18): 1062. https://doi.org/10.5334/dsj-2020-012

- **Data collections** from spacecraft (Wind, Cassini, Ulysses, STEREO, ISEE3, Voyager…) and ground based instruments (Nançay)

- **Modeling tools:**
  - ExPRES *(Exoplanetary and Planetary Radio Emission Simulator), code available in Github + run-on-demand interface*
  - ARTEMIS-P *(Anisotropic Ray Tracer for Electromagnetic in Magnetospheres, Ionospheres and Solar-wind, including Polarisation)*

- **Interfaces:** Data discovery (VESPA) + data access (das2 + HAPI)

- **Software:** Python library (Maser4py)

- **Web page:** http://maser.lesia.obspm.fr

VESPA & VESPA-Cloud

- Virtual European Solar and Planetary Access (VESPA), under Europlanet-2024-RI (2020-2024)

- “Heliophysics” is one of the main topic, with solar remote sensing, solar system radio astronomy and in-situ plasma.

- VESPA = data discovery, with “coverage”, “provenance” and “access” standardised metadata

- Many “heliophysics” metadata catalogs available (current 1/3 of services), more to come.

VESPA & VESPA-Cloud

- VESPA goes on the “cloud”:
  - prototyping cloud-hosted VESPA services
  - goal = supporting small data providers
  - using the European Open Science Cloud (EOSC)

- On-going activity

- Observatoire de Paris will be member of “EOSC Association” to make sure that community needs are fulfilled.

Solar Data

- BASS2000 = Ground based solar observation database (See J. Aboudarham presentation)

- Content:
  - Daily solar images
  - Reference solar spectrum
  - Solar and Heliophysics feature catalog

- DOIs for collections

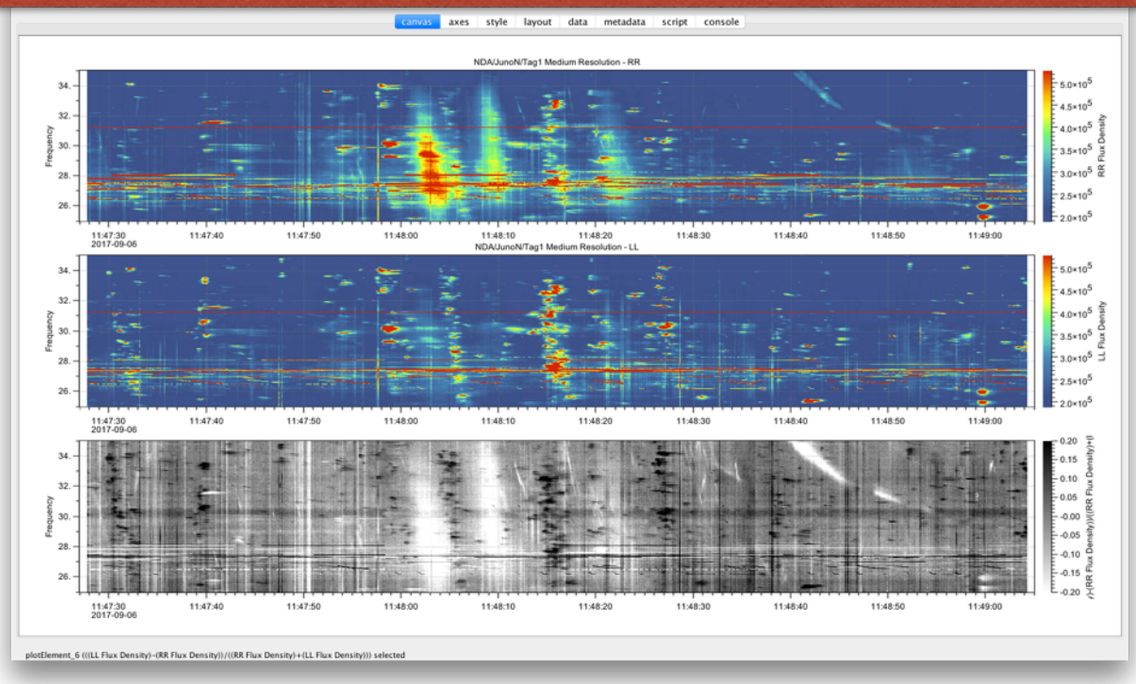
- Certification: WDS/ICSU

Radio Data

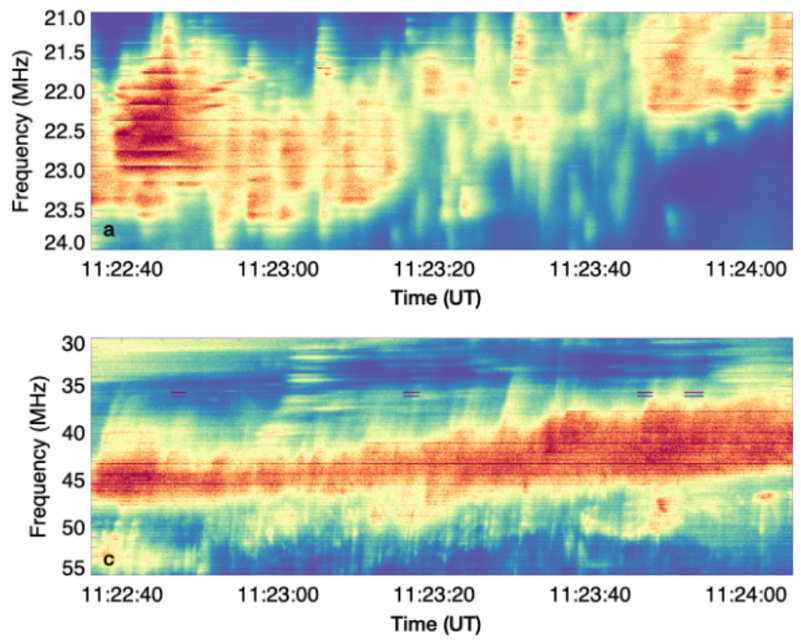
- Nançay Data Centre (CDN):
  Storage and computing for radio astronomy in Nançay

- Heliophysics instruments (support to space missions)
  - NRH-Nançay Radio Heliograph (under heavy maintenance)
  - NDA-Nançay Decameter Array (Jupiter + Sun, routine since1990)
  - NenuFAR (new observatory <80 MHz, with “Sun key-project”)

NDA+JunoN+das2+Autoplot



NenuFAR Sun-KP observation



Overall data volume

Collection	Repository	Volume (TB)
MASER	PADC	35 TB
BASS2000	PADC	1 TB
NDA	CDN	90 TB
NenuFAR	CDN	45 TB
NRH+ORFEES	CDN	35 TB
WIND/STEREO	PADC	10 TB
	TOTAL	**216 TB**

Inventory in progress