



ISWI Data Subcommittee Report

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ISWI Steering Committee Meeting, February 19, 2021

Discussion Topics

- ISWI (Open) Data Policy Status
- Quart chart for instrument update
- Enhancing ISWI Data Discoverability & Accessibility
- Opportunities for International collaboration and coordination
 - SCOSTEP/PRESTO
 - COSPAR/ISWAT
 - International Heliophysics Data Environment Alliance (IHDEA)

ISWI Data Policy Status

- The ISWI data policy has been established since November 2017
 - Facilitate ISWI data flow across geo-political & organizational boundaries
 - Promote international collaborations & coordination in data exchange to enable space weather research and capacity building
- Last updated on February 12, 2021 (version 1.3.8)
 - 19 ISWI instruments (see Projects under <http://www.iswi-secretariat.org/>)
 - PDMP updates (3): Callisto, CHAIN, GMDN
 - PDMPs remain outstanding (4):
 - AMMA
 - CIDR
 - RENOIR
 - SCINDA

ISWI Instrument & Data Product Updates (1/2)

Instrument name: e.g., AWESOME

PI: Please indicate changes

Tech Lead/POC: Please indicate changes

Science objectives: Please indicate changes

Measurement objectives: Please indicate changes

Science Activity Updates

Instrument and Data Product Updates

Instrument updates:

Station updates:

Data product updates:

Capacity Building Activity Updates

ISWI Instrument & Data Product Updates (2/2)

- Continuation of Instrument and Data Product Updates (if needed)
- Continuation of Science Activity Updates (if needed)
- Continuation of Capacity Building Activity Updates (if needed)
- References

Enhancing ISWI Data Discoverability & Accessibility

Best supported by leveraging existing data service infrastructure:

1. Data from e-Callisto & AWESOME (in WALDO database) are now accessible and searchable from two NASA data services:
 - a. [NASA Heliophysics Data Portal](#)
 - b. [Virtual Wave Observatory](#)
2. Enabled by
 - a. Adopting the [SPASE metadata model](#) for describing ISWI data, and
 - b. Registering ISWI metadata on the [SPASE metadata registry](#)
3. SPASE is now the [COSPAR recommended metadata standard](#)

“Naming Authority” in SPASE Metadata Registry

- ISWI is now a [SPASE Metadata Registry](#) registered Naming Authority
 - All registered ISWI instrument data products will be attributed to ISWI at the highest level

Advantages to ISWI:

- 1) Data become more discoverable by broader user community
- 2) Searchable along with other related space-based & ground-based data resources

NASA GODDARD SPACE FLIGHT CENTER Space Physics Data Facility | + Goddard Home + Visit NASA.gov

Heliophysics Data Portal

“Find it. Browse it. Get it.” **SPASE inside**

Help Geo Orbits Helio Orbits SPASE Registry ADS Abstracts Feedback

Text Restriction
callisto Add

Time Span Restriction
YYYY-MM-dd or YYYY-DDD
from: to: Add

Element Restriction
Resource type Measurement type Observatory Group Observatory

Current Product Restrictions
Remove All
Metadata contains 'callisto' Remove
Showing 1 - 2 of 2 Results Sort by Observatory

#	Products (& SPASE descriptions)	Access Links
1	CALLISTO Quicklook Solar Spectrogram Plots	<ul style="list-style-type: none"> Callisto Quicklook Plots e-Callisto International Network of Solar Radio Spectrometers List of e-Callisto member stations and their operating status
2	CALLISTO Solar Spectrogram FITS files	<ul style="list-style-type: none"> Callisto FITS files Callisto FITS files e-Callisto International Network of Solar Radio Spectrometers List of e-Callisto member stations and their operating status

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Text Restriction
awesome Add

Time Span Restriction
YYYY-MM-dd or YYYY-DDD
from: to: Add

Element Restriction
Resource type Measurement type Observatory Group Observatory

Current Product Restrictions
Remove All
Metadata contains 'awesome' Remove
Showing 1 - 6 of 6 Results Sort by Observatory

#	Products (& SPASE descriptions)	Access Links
1	AWESOME receiver system quick-look Broadband Summary Charts for VLF Data	<ul style="list-style-type: none"> Worldwide Archive of Low-Frequency Data and Observations (WALDO) Broadband Summary Charts Worldwide Archive of Low-Frequency Data and Observations (WALDO)
2	AWESOME receiver system broadband VLF data https://doi.org/10.48322/fzcf-f191	<ul style="list-style-type: none"> Worldwide Archive of Low-Frequency Data and Observations (WALDO) Broadband Data Worldwide Archive of Low-Frequency Data and Observations (WALDO)

Virtual Wave Observatory

— QUERY + TUTORIALS + EDUCATION + ANNOTATION + EVENTS + RESOURCES

+ Home version: 3.0

WVO Query Builder

Restrict your query to the following available Data Sources then press Apply This Condition button

Double click on a data source element to view its metadata.

Apply The Following Conditions Reset

Time Range
Start: 2016-01-01T00:00:00.000Z = Stop: 2016-01-02T00:00:00.000Z + Events
-1 day | -1 hr | +1 hr | +1 day -1 day | -1 hr | +1 hr | +1 day

Data Set Selection
WVO VHO VMO VSO VIRBO VITMO VMR

Observatory	Instrument
Perth Townsville Vanimo Weipa Willis Island AWESOME e-Callisto GIRO IMAGE ISIS-1 ISIS-2	ASWS Willis Island AWESOME LF VLF e-Callisto Network Spectrometers GIRO IMAGE ISIS-1 ISIS-2

Run Query

Data Product

AWESOME LF
Broadband LF
AWESOME VLF
Broadband VLF
Narrowband
Network Spectrometers
CALLISTO Quicklook Solar Spectrogram Plots
CALLISTO Solar Spectrogram FITS files

Collaboration and Coordination with SCOSTEP/PRESTO

- ISWI and SCOSTEP share similar goals in science, international coordination and collaboration, and capacity building.
- PRESTO, the current SCOSTEP 5-year project, has announced a call for the creation of solar-terrestrial databases to support their 3 pillars of science studies:
 - i. Sun, interplanetary space and geospace
 - ii. Space weather and the Earth's atmosphere
 - iii. Solar activity and its influence on the climate of the Earth System
- ISWI instruments should be valuable data resources for SCOSTEP/PRESTO.

Collaborating with COSPAR/ISWAT

- International Space Weather Action Teams (ISWAT; <https://iswat-cospar.org/>)

- Space weather
 - Multi-disciplinary
 - Cuts across all domains
 - Requires the global community to work together.
- Action Teams
 - Self-guided collaborative efforts
 - Organized into [ISWAT Clusters](#).
- ISWI and ISWAT can collaborate to their mutual benefits.

The COSPAR ISWAT initiative is a global hub for collaborations addressing challenges across the field of space weather.

S: Space weather origins at the Sun	H: Heliosphere variability	G: Coupled geospace system	Impacts
S1: Long-term solar variability	H1: Heliospheric magnetic field and solar wind	G1: Geomagnetic environment	Climate
S2: Ambient solar magnetic field, heating & spectral irradiance	H2: CME structure, evolution and propagation through heliosphere	G2a: Atmosphere variability	Electric power systems/GICs
S3: Solar eruptions	H3: Radiation environment in heliosphere	G2b: Ionosphere variability	Satellite/debris drag
	H4: Space weather at other planets/planetary bodies	G3: Near-Earth radiation & plasma environment	Navigation/Communications
Overarching Activities:			(Aero)space assets functions
O1: Assessment			Human exploration
O2: Information Architecture & Data Utilization			
O3: Innovative Solutions			
O4: Education & Outreach			

Collaboration and exchange of ideas. The sum is worth more than its parts.

2020 COSPAR Activities...cont.

- 43rd Scientific Assembly (<https://www.cospar2020.org/>)
 - Jan 28- Feb 04, 2021, Sydney, Australia
 - COSPAR-20-PSW.4: Space Weather Information Architecture and Its Roles in Enhancing Data Access and Utilization
 - https://www.cospar-assembly.org/admin/session_cospar.php?session=968
 - Panel discussion: *Challenges of information architecture for space weather*
 1. More (international) data sources with interoperability and accessibility.
 - This means agreement on standards and open data access.
 2. Availability of raw data products to ensure that higher level data products can be created.
 3. Computational resources to enable AI/ML training & modeling, and ensemble forecasts.
 4. As many open-source models as possible to fix bugs which ultimately ensures better predictions.
 5. ...etc.

Collaborating with the International Heliophysics Data Environment Alliance (IHDEA; <https://ihdea.net>)

- Established in December 2019 with vision:

“To enable the international heliophysics and space weather research community to seamlessly find, access, & use all electronically accessible HP/SW data sets in accordance with the *FAIR principles (Findable, Accessible, Interoperable, and Reusable)*.”
- IHDEA focuses are on:
 - Enabling efficient exchange of and access to the diverse data products obtained from space missions, ground-based experiments, and models;
 - Fostering coordinated development of existing and future heliophysics standards for data, metadata, and services to enable interoperability; and
 - Promoting and assisting the adoption of the above standards (e.g. SPASE).
- **Through its international collaboration and coordination, the IHDEA can help promote and distribute ISWI instrument data.**