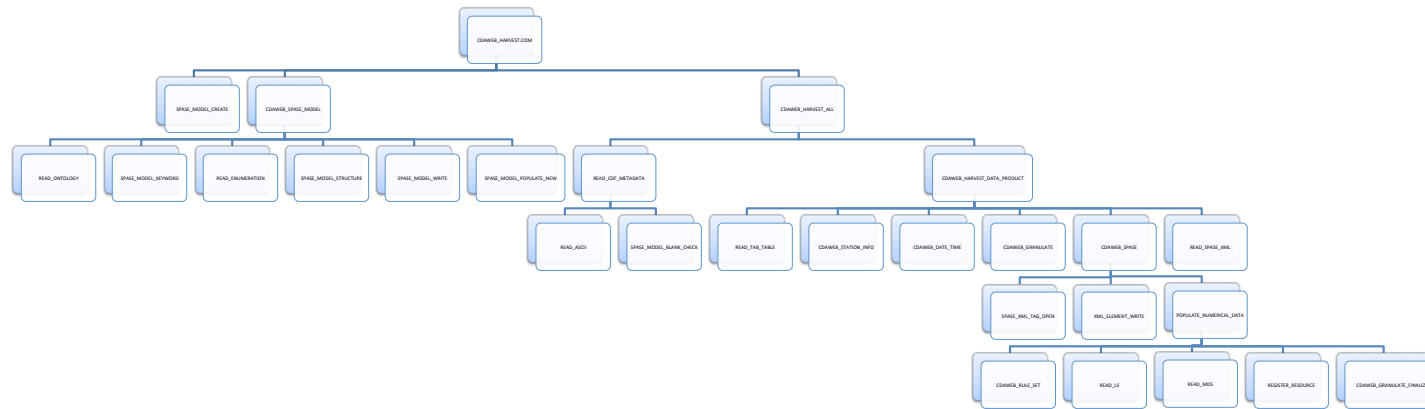# ADAPT for SPDF CDF Data Products

ADAPT - Active Data Archive Product Tracking

ADAPT Objectives and Philosophy

- Enable automatic generation of SPASE XML metadata files to document self-describing, i.e., Heliophysics data products – Numerical Data

- The ADAPT effort is committed to providing accurate, precise, and complete SPASE documentation for data products through the implementation of quality control methods and the adoption of and adherence to uniform metadata populating standards. Complete SPASE documents must include Parameter level metadata.

- Think HAPI be happy.

- We must strive to register SPASE documentation that at least surpasses the quality and quantity of information that is already available.

- Aiming any lower bar is simply a waste of our time and effort.

SPASE 2.3.1 Populate and Write IDL Routines

For Example: populate_numerical_data.pro and write_numerical_data.pro

Access Information	Document	Numerical Data	Rendering Hints
Access URL	Element	Observation Extent	Repository
Annotation	Energy Range	Observatory	Resource Header
Association	Field	Operating Span	Service
Azimuthal Angle Range	Frequency Range	Parameter	Source
Bin	Funding	Particle	Spase
Catalog	Granule	Person	Structure
Checksum	Information URL	Pitch Angle Range	Support
Contact	Instrument	Polar Angle Range	Temporal Description
Coordinate System	Location	Publication Info	Time Span
Data Extent	Mass Range	Registry	Wave
Display Data	Mixed	Rendering Hints	Wavelength Range

Create SPASE 2.3.1 IDL Container Routines

- **Read generic SPASE schema**

- **Custom edit SPASE schema occurrence_number and occurrence_required Settings, i.e., Contact occur number, Information URL occur required settings**

- **Auto generate SPASE Populate and Write IDL routines**

- **Edit population_numerical_data.pro IDL routine**

Generic vesus Custom SPASE Numerical Data Template

```
<ResourceHeader>
  <ResourceName></ResourceName>
  <ReleaseDate></ReleaseDate>
  <Description></Description>
  <Acknowledgement></Acknowledgement>
  <Contact>
    <PersonID></PersonID>
    <Role></Role>
  </Contact>
  <InformationURL>
    <Name></Name>
    <URL></URL>
    <Description></Description>
  </InformationURL>
</ResourceHeader>
```

```
<ResourceHeader>
  <ResourceName></ResourceName>
  <ReleaseDate></ReleaseDate>
  <Description></Description>
  <Acknowledgement></Acknowledgement>
  <Contact>
    <PersonID></PersonID>
    <Role></Role>
  </Contact>
  <Contact>
    <PersonID></PersonID>
    <Role></Role>
  </Contact>
  <Contact>
    <PersonID></PersonID>
    <Role></Role>
  </Contact>
  <InformationURL>
    <Name></Name>
    <URL></URL>
    <Description></Description>
  </InformationURL>
  <InformationURL>
    <Name></Name>
    <URL></URL>
    <Description></Description>
  </InformationURL>
  <InformationURL>
    <Name></Name>
    <URL></URL>
    <Description></Description>
  </InformationURL>
</ResourceHeader>
```

Populate Numerical Data IDL Routine - Generic

```
numerical_data.resource_id=''

numerical_data.resource_header.resource_name=''
numerical_data.resource_header.alternate_name=''
numerical_data.resource_header.doi=''
numerical_data.resource_header.release_date=''
numerical_data.resource_header.expiration_date=''
numerical_data.resource_header.description=''
numerical_data.resource_header.acknowledgement=''

numerical_data.resource_header.publication_info.authors=''
numerical_data.resource_header.publication_info.publication_date=''
numerical_data.resource_header.publication_info.published_by=''

numerical_data.resource_header.funding.agency=''
numerical_data.resource_header.funding.project=''
numerical_data.resource_header.funding.award_number=''

for contact_loop=0,14 do begin

   numerical_data.resource_header.contact(contact_loop).person_id=''

   for role_loop=0,4 do $
      numerical_data.resource_header.contact(contact_loop).role(role_loop)=''

   numerical_data.resource_header.contact(contact_loop).start_date=''
   numerical_data.resource_header.contact(contact_loop).stop_date=''
   numerical_data.resource_header.contact(contact_loop).note=''

endfor
```

```
for information_url_loop=0,5 do begin

   numerical_data.resource_header.information_url(information_url_loop).name=''
   numerical_data.resource_header.information_url(information_url_loop).url=''
   numerical_data.resource_header.information_url(information_url_loop).description=''
   numerical_data.resource_header.information_url(information_url_loop).language=''

endfor

numerical_data.resource_header.association.association_id=''
numerical_data.resource_header.association.association_type=''
numerical_data.resource_header.association.note=''

for prior_id_loop=0,8 do numerical_data.resource_header.prior_id(prior_id_loop)=''
```

Populate Numerical Data IDL Routine - Custom

Generic:

resource_name_text=''

Custom:

resource_name_text= $
    strtrim(strcompress(cdaweb_master_notes.mission_name_acronym+' '+ $
            cdaweb_master_notes.instrument+' ('+ $
            cdaweb_master_notes.instrument_acronym+') '+ $
            cdaweb_master_notes.instrument_detail+', '+ $
            strtrim(strcompress(cdaweb_master_notes.processing_level))+' '+ $
            strtrim(strcompress(cdaweb_master_notes.processing_level_acronym))+', '+ $
            cadence_final+' Data'),2)

numerical_data.resource_header.resource_name=resource_name_text

```xml
<ResourceHeader>
  <ResourceName>ERG Ephemeris, Definitive Spacecraft Position, Velocity, Footpoint, and Model Magnetic Field, Level 2 (L2), 6 s Data</ResourceName>
  <ReleaseDate>2019-10-14T12:34:56.789Z</ReleaseDate>
  <Description>Arase, Exploration of Energization and Radiation in Geospace, ERG, Definitive Orbit, Level 2, 6 s Data. The International Geomagnetic Reference Field, IGRF, Model was used for the Internal Magnetic Field for these Coordinate and Mapping Calculations. The International Radiation Belt Environment Modeling, IRBEM, Library was used for calculating the L-shell Parameters and Adiabatic Invariants in this File. See: https://craterre.onecert.fr/prbem/irbem/description.html.</Description>
  <Acknowledgement>Please acknowledge I. Shinohara, Y. Miyoshi, M. Teramotofor use of the Data.
Rules of the Road for Users of the ERG/Arase Mission Data Products:
* 1. Users of all Level of Scientific Products from the ERG/Arase Project should contact Instrument PI Team(s), Project Manager, PM, and Project Scientist, PS, before using the Data for any Presentation and Publication. The PI(s), PM: Iku Shinohara, iku@stp.isas.jaxa.jp, or PS: Yoshizumi Miyoshi, miyoshi@isee.nagoya-u.ac.jp may suggest potential Coauthor(s) from the ERG/Arase Project Side for any Presentation and Publication. Some necessary Articles suggested by the PI(s) should be cited.
* 2. Users should always use the latest Version of Data Files in CDF provided from the ERG Science Center or from the NASA Space Physics Data Facility, SPDF, for their Data Analysis, Presentation and Publications. Redistribution of the Data Files is strictly prohibited.
* 3. Users should send Presentation Materials and Papers including ERG/Arase Data to Instrument PI Team(s), PM, and PS enough before Presentation and Paper Submission, so that sufficient Time is available for those responsible for the Data to check if the Data are properly processed/used and to get necessary Comments back to the Data Users.
* 4. Publications that use ERG/Arase Satellite Data should cite the Project Overview Paper (Miyoshi et al., Earth Planets Space, DOI:10.1186/s40623-018-0862-0, 2018) and include the following Text in the Paper Acknowledgements: "&quot;Science Data of the Arase, ERG, Satellite are obtainable from the ERG Science Center operated by ISAS/JAXA and ISEE/Nagoya University, see https://ergsc.isee.nagoya-u.ac.jp/index.shtml.en.&quot;</Acknowledgement>
  <Contact>
    <PersonID>spase://SMWG/Person/Iku.Shinohara</PersonID>
    <Role>PrincipalInvestigator</Role>
  </Contact>
  <Contact>
    <PersonID>spase://SMWG/Person/Yoshizumi.Miyoshi</PersonID>
    <Role>PrincipalInvestigator</Role>
  </Contact>
  <InformationURL>
    <Name>The ERG/Arase Website</Name>
    <URL>http://ergsc.isee.nagoya-u.ac.jp</URL>
    <Description>The ERG/Arase Science Center Website operated by ISAS/JAXA and ISEE/Nagoya University</Description>
  </InformationURL>
    <InformationURL>
    <Name>Rules of the Road, ERG/Arase Project, Japanese</Name>
    <URL>https://ergsc.isee.nagoya-u.ac.jp/data_info/rules_of_the_road.shtml.ja</URL>
    <Description>Rules of the Road for Users of the ERG/Arase Mission Data Products, Japanese</Description>
  </InformationURL>
</ResourceHeader>
```

```xml
<AccessInformation>
    <RepositoryID>spase://SMWG/Repository/NASA/GSFC/SPDF</RepositoryID>
    <Availability>Online</Availability>
    <AccessRights>Open</AccessRights>
    <AccessURL>
        <Name>FTP access to files at SPDF</Name>
        <URL>ftps://spdf.gsfc.nasa.gov/pub/data/erg/orb/l2/</URL>
        <Description>Access to Data in CDF Format via ftp from SPDF</Description>
    </AccessURL>
    <AccessURL>
        <Name>HTTP access to files at SPDF</Name>
        <URL>https://spdf.gsfc.nasa.gov/pub/data/erg/orb/l2/</URL>
        <Description>Access to Data in CDF Format via http from SPDF</Description>
    </AccessURL>
    <AccessURL>
        <Name>CDAWeb</Name>
        <URL>https://cdaweb.sci.gsfc.nasa.gov/cgi-bin/eval2.cgi?dataset=ERG_ORB_L2&amp;index=sp_phys</URL>
        <ProductKey>ERG_ORB_L2</ProductKey>
        <Description>Access to ASCII, CDF, and Plots via NASA/GSFC CDAWeb</Description>
    </AccessURL>
    <Format>CDF</Format>
    <Encoding>None</Encoding>
    <Acknowledgement>Please acknowledge I. Shinohara, Y. Miyoshi, M. Teramoto. Please acknowledge the Data Providers
and CDAWeb when using these Data.</Acknowledgement>
</AccessInformation>
<ProcessingLevel>Calibrated</ProcessingLevel>
<InstrumentID>spase://SMWG/Instrument/Arase/Ephemeris</InstrumentID>
<MeasurementType>Ephemeris</MeasurementType>
<MeasurementType>MagneticField</MeasurementType>
<TemporalDescription>
    <TimeSpan>
        <StartDate>2016-12-20T00:00:00.000</StartDate>
        <RelativeStopDate>-P7D</RelativeStopDate>
    </TimeSpan>
    <Cadence>PT6S</Cadence>
</TemporalDescription>
```

SPDF File Resources used for SPASE Numerical Data Generation and some Example of the Merits of Automation

- filelist.gz – A complete list of the CDAWeb files including file sizes and file change time stamps.

- The CDAWeb CDF Master files – Master CDFs, one per Data Product if available, include no data observations. Instead the Master CDFs provide text-glossed metadata to correct errors in the CDF self-documentation or to enhance such information.

SPDF CDF Data Product Assay – 2019-10-06

- **Total number of CDFs:** 8932810

- **Number of Data Products: 2835 (1750)**

- **CDF File Naming Formats: 20**

CDF File Name Format Data Product Counts

1715	YYYYMMDD
47	YYYYDOYHHMMSS
177	YYYYMMDDHHMMSS_MMS
18	YYYYMMDDHHMM
243	YYYYMMDD_RBSP
5	YYYYMMDDHHMMSS_FAST
78	YYYYMMDD_RBSP_DASH
4	YYYYMMDDHH_RBSP
472	YYYYMMDDHHMMSS
8	YYYYMMDDHH
16	YYYYMMDD_ARASE
34	YYYYMMDD_MAVEN
1	YYYYMMDD_ULYSSES
1	YYDOY
1	YYYYDOY
1	YYYYDOY_HAWKEYE
1	YYYYMMDDHHMM_SOHO
1	YYYYMMDD_NO_VERSION
4	YYYYMMDD_IBEX_MAP
8	YYYYMMDD_IBEX_YEAR

The identification of file name formats allows one to get a complete and accurate list of CDF data products. Also, the same work yields automated determination of the following global level SPASE metadata term content:

- Access URL
- Time Span, Start Date
- Time Span, Stop Date

These values are determined with accuracy and precision at the time of the SPDF file list snap shot.

SPDF CDF Assay Serendipity: 0.00272%

50 Bad Data Product Directory
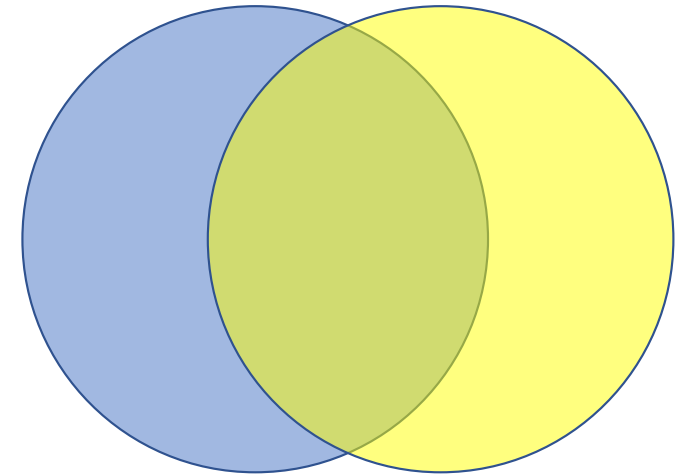
1   Bad Directory Path DOY-File DOY Match

177 Bad Directory Path Node Num

15 Bad Directory Path Year-File Year Match

CDF Global Attribute to SPASE Metadata Mapping

Table 1 Transform Schema for mapping CDF Global Attributes to SPASE Numerical Data

CDF Global Attribute	SPASE Numerical Data Mapping	Edit	Non CDF Metadata Sources, Processing Programs, Notes
LOGICAL_SOURCE	NumericalData/ResourceID	Yes	SMWG, cdaweb_sc_list.txt
LOGICAL_SOURCE	NumericalData/ResourceID	Yes	SMWG, cdaweb_spase_map_cadence.pro
MISSION_GROUP	NumericalData/ResourceID	Yes	SMWG, global_attribute_mission_group.sed, cdaweb_sc_list.txt
LOGICAL_SOURCE_DESCRIPTION	NumericalData/ResourceHeader/ResourceName	Yes	
TITLE	NumericalData/ResourceHeader/ResourceName	Yes	
DESCRIPTOR	NumericalData/ResourceHeader/Description	Yes	
TEXT	NumericalData/ResourceHeader/Description	Yes	
PI_NAME	NumericalData/ResourceHeader/Contact/Name	Yes	pi_name_to_person_resource_id.sed
PI_NAME	NumericalData/ResourceHeader/Contact/PersonID	Yes	pi_name_to_person_resource_id.sed
ACKNOWLEDGEMENT	NumericalData/ResourceHeader/Acknowledgement	Yes	global_attribute_acknowledgement.sed
ACKNOWLEDGEMENT	NumericalData/AccessInformation/Acknowledgement	Yes	global_attribute_acknowledgement.sed
PI_NAME	NumericalData/AccessInformation/Acknowledgement	Yes	global_attribute_pi_name_to_person_resource_id.sed
Not Applicable	NumericalData/AccessInformation/RepositoryID	Yes	SMWG
Not Applicable	NumericalData/AccessInformation/AccessURL/URL	Yes	CDAWEB ISTP Diectory Listing, Smoke and Mirrors
LINK_TITLE	NumericalData/ResourceHeader/InformationURL/Name		
LINK_TEXT	NumericalData/ResourceHeader/InformationURL/Description		
HTTP_LINK	NumericalData/ResourceHeader/InformationURL/URL		
PI_AFFILIATION	NumericalData/ResourceHeader/Acknowledgement		
LOGICAL_SOURCE	NumericalData/InstrumentID	Yes	SMWG
MISSION_GROUP	NumericalData/InstrumentID	Yes	SMWG
INSTRUMENT_TYPE	NumericalData/MeasurementType	Yes	cdaweb_spase_map_measurement_type.pro
Not Applicable	NumericalData/TemporalDescription/TimeSpan/StartDate	Yes	CDAWEB ISTP Diectory Listing, Smoke and Mirrors
.	NumericalData/TemporalDescription/TimeSpan/EndDate	Yes	CDAWEB ISTP Diectory Listing, Smoke and Mirrors
LOGICAL_SOURCE	NumericalData/TemporalDescription/Cadence	Yes	cdaweb_spase_map_cadence.pro
CAVEATS	NumericalData/Caveats	Yes	global_attribute_caveats.sed
TITLE	NumericalData/Keyword		
MISSION_GROUP	NumericalData/Keyword	Yes	global_attribute_mission_group.sed
PROJECT	NumericalData/Keyword	Yes	global_attribute_project.sed
DATA_VERSION	NumericalData/Keyword	Yes	global_attribute_data_version.sed
DISCIPLINE	NumericalData/Keyword	Yes	global_attribute_discipline.sed
DATA_TYPE	NumericalData/Keyword	Yes	global_attribute_data_type.sed
ADID_REF	NumericalData/Keyword	Yes	global_attribute_adid_ref.sed
GENERATION_DATE	NumericalData/Keyword	Yes	global_attribute_generation_date.sed
NSSDC_ID	NumericalData/Keyword	Yes	global_attribute_nssdc_id.sed
MODS	NumericalData/Keyword	Yes	global_attribute_mods.sed
SOFTWARE_VERSION	NumericalData/Keyword	Yes	global_attribute_software_version.sed
GENERATED_BY	NumericalData/Keyword	Yes	global_attribute_generated_by.sed
RULES_OF_USE	NumericalData/Keyword	Yes	global_attribute_rules_of_use.sed
TEXT_SUPPLEMENT_1	NumericalData/Keyword	Yes	global_attribute_text_supplement_1.sed
LOGICAL_FILE_ID	Used to cross check LOGICAL_SOURCE Metadata	Yes	global_attribute_logical_file_id.sed

SPASE Global Level Metadata Overriding

Tab separated table for Parameter Metadata with these Columns:

Mission Name
Mission Name Acronym
Instrument
Instrument Acronym
Instrument Detail
Processing Level
Processing Level Acronym
Time Resolution
PI Name
PI Institution

Relative Stop Date

CDF Variable Attribute to SPASE Parameter Metadata Mapping

CDF Variable Attribute	SPASE Numerical Data Parameter Mapping	Edit	Non CDF Metadata Sources, Processing Programs, Notes
FIELDNAM	NumericalData/Parameter/Name		
DEPEND_0	NumericalData/Parameter/Set		
CATDESC	NumericalData/Parameter/Set		
cdf_variable_info.name	NumericalData/Parameter/ParameterKey		Note that Parameter Key is populated without using Variable Attributes
VAR_NOTES	NumericalData/Parameter/Caveats		
AVG_PTR_1	NumericalData/Parameter/Caveats		
AVG_TYPE	NumericalData/Parameter/Caveats	Yes	variable_attribute_avg_type.sed
VIRTUAL	NumericalData/Parameter/Caveats	Yes	Virtual Variable designation flag
FUNCT	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
FUNCTION	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_0	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_1	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_2	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_3	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_4	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_5	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_6	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_7	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_8	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_9	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_10	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_11	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_12	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_13	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
COMPONENT_14	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
MONOTON	NumericalData/Parameter/Caveats	Yes	Virtual Variable support metadata
Not Applicable	NumericalData/Parameter/Cadence	Yes	cdaweb_spase_map_cadence.pro and the Global Variable LOGICAL_SOURCE
TIME_RES	NumericalData/Parameter/Cadence	Yes	variable_attribute_time_res_to_cadence.sed
RESOLUTION	NumericalData/Parameter/Cadence		
UNITS	NumericalData/Parameter/Units		
SI_CONVERSION	NumericalData/Parameter/UnitsConversion	Yes	variable_attribute_si_conversion.sed
DICT_KEY	NumericalData/Parameter/CoordinateSystem/CoordinateSystemName	Yes	variable_attribute_dict_key.sed
FRAME	NumericalData/Parameter/CoordinateSystem/CoordinateSystemName	Yes	variable_attribute_frame_to_coordinate_system_name.sed
COORDINATE_SYSTEM	NumericalData/Parameter/CoordinateSystem/CoordinateSystemName	Yes	
DICT_KEY	NumericalData/Parameter/CoordinateSystem/CoordinateRepresentation	Yes	variable_attribute_dict_key.sed
FRAME	NumericalData/Parameter/CoordinateSystem/CoordinateRepresentation	Yes	variable_attribute_frame_to_coordinate_representation.sed
REPRESENTATION_1	NumericalData/Parameter/CoordinateSystem/CoordinateRepresentation	Yes	
DISPLAY_TYPE	NumericalData/Parameter/RenderingHints/DisplayType	SPASE	SPASE Rendering Hints Structure needed inside of SPASE Element Structure
LABLAXIS	NumericalData/Parameter/RenderingHints/AxisLabel	SPASE	SPASE Rendering Hints Structure needed inside of SPASE Element Structure
	NumericalData/Parameter/RenderingHints/RenderingAxis	SPASE	SPASE Rendering Hints Structure needed inside of SPASE Element Structure
	NumericalData/Parameter/RenderingHints/Index	SPASE	SPASE Rendering Hints Structure needed inside of SPASE Element Structure
FORMAT	NumericalData/Parameter/RenderingHints/ValueFormat	SPASE	SPASE Rendering Hints Structure needed inside of SPASE Element Structure
FORM_PTR	NumericalData/Parameter/RenderingHints/ValueFormat	SPASE	SPASE Rendering Hints Structure needed inside of SPASE Element Structure
SCALEMIN	NumericalData/Parameter/RenderingHints/ScaleMin	SPASE	SPASE Rendering Hints Structure needed inside of SPASE Element Structure
SCALEMAX	NumericalData/Parameter/RenderingHints/ScaleMax	SPASE	SPASE Rendering Hints Structure needed inside of SPASE Element Structure
SCALETYP	NumericalData/Parameter/RenderingHints/ScaleType	SPASE	SPASE Rendering Hints Structure needed inside of SPASE Element Structure
PROPERTY	NumericalData/Parameter/Structure/Size		
SCALEMIN	NumericalData/Parameter/Structure/Size		
DEPEND_1	NumericalData/Parameter/Structure/Element/Name		
	NumericalData/Parameter/Structure/Element/Qualifier	***	
SI_CONVERSION	NumericalData/Parameter/Structure/Element/Index	Yes	Automatically loop indexed
LABL_PTR_1	NumericalData/Parameter/Structure/Element/ParameterKey		
UNIT_PTR	NumericalData/Parameter/Structure/Element/Units		
Not Applicable	NumericalData/Parameter/Structure/Element/UnitsConversion	Yes	variable_attribute_si_conversion.sed
VALIDMIN	NumericalData/Parameter/Structure/Element/ValidMin		
VALIDMAX	NumericalData/Parameter/Structure/Element/ValidMax		
FILLVAL	NumericalData/Parameter/Structure/Element/FillValue		
Not Applicable	NumericalData/Parameter/Particle/ParticleType	Yes	Not fully implemented
FIELDNAM	NumericalData/Parameter/Support/SupportQuantity	Yes	Not fully implemented
Not Applicable	NumericalData/Parameter/Support/SupportQuantity	Yes	Scan variable_info.name to search for ephemeris and other positional variables

SPASE Parameter Metadata Overriding

Tab separated table for Parameter Metadata with these Columns:

- **Units**
- **Units Conversion**
- **Name**
- **Description**
- **Measurement Type**
- **Parameter Keyword**
- **Type**
- **Quantity**
- **Qualifier**
- **Instrument ID**
- **Coordinate System Name**
- **Coordinate Representation**

Units and Units Conversion Normalization

(cm^2 s sr keV)^-1
(cm^2-s-sr-keV)^-1
cm^-2 s^-1 sr^-1 keV^-1
#\/s-cm2-sr-keV
1\/keV-sr-s-cm2

(cm^2 s sr keV)^-1   6.24161e-16>(m^2 s sr J)^-1

SunPy? – Probably Yes

Table 1. Heliophysics Data Portal, HDP, SPASE Description Status Report   **2019-10-12T01:00:01**

Number of Data Products with complete SPASE Metadata: 1333

Number of Data Products without Parameter Metadata: 151

Number of Data Products without SPASE Metadata: 266

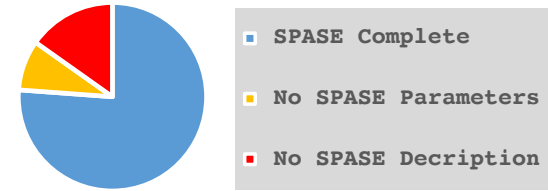Total Number of Data Products: 1750

■ SPASE Complete

■ No SPASE Parameters

■ No SPASE Decription

Table 2. HDP Status Report: Data Products without SPASE Metadata, Summary by Mission

Count	Data Product Acronym	Mission Group/Name
22	ERG	Arase Geospace Probe, Exploration of energization and Radiation in Geospace, ERG
42	HELIO1DAY	Helio Daily Position Data Products
4	MMS[1-4]	Magnetosphere Multiscale Mission, MMS 1, MMS 2, MMS 3, MMS 4, Satellites
2	OMNI	OMNI near-Earth Solar Wind Magnetic Field and Plasma Parameter Data Products
195	TSS	Space Shuttle Tethered Sub Satellite
1	VOYAGER[12]	Voyager 1, Voyager 2, Satellites
266	Total	

Table 3. HDP Status Report: Data Products without Parameter Metadata, Summary by Mission

Count	Data Product Acronym	Mission Group/Name
1	ALOUETTE2	Alouette 2 Satellite
4	APOLLO1[25]	Apollo 12, Apollo 15 Mission Experiments
1	CN	Canadian Auroral Network for the OPEN Program Unified Study, CANOPUS, Program
5	CNOFS	Communications/Navigation Outage Forecasting System, C/NOFS, Satellite
1	CRRES	Combined Release and Radiation Effects Satellite
2	CSSWE	Colorado Student Space Weather Experiment CubeSat
9	DE[12]	Dynamics Explorer, DE 1, DE 2, Satellites
6	EQ	Equator-S Satellite
8	GE	Geotail Satellite, ISTP Program
3	GPS	Global Positioning System Satellites
4	G[O67], GOES1[01]*[0-9]	Geostationary Operational Environmental Satellites, GOES, 5 to 17
2	HELIOS[12]	Helios 1, Helios 2, Satellites
1	HK	Hawkeye Satellite
13	IA, IT	Interball Auroral, Interball Tail Probes
16	IM	Imager for Magnetopause-to-Aurora Global Exploration, IMAGE, Satellite
3	I[12]	International Satellite for Ionosphere Studies, ISIS 1, ISIS 2, Satellites
2	L[79]	LANL 1989 (1989-046A), LANL 1997 (LANL 97A), Satellites
1	MESSENGER	Mercury Surface, Space Environment, Geochemistry and Ranging Satellite
17	PO, POLAR	Polar Satellite, ISTP Program
1	RS	Republic of China Satellite, ROCSAT
5	SE	Sentinel-1 SAR companion Multistatic Explorer, SESAME, Satellite
2	SNOE	Student Nitric Oxide Explorer Satellite
11	ST[AB]	Solar-Terrestrial Relations Observatory, STEREO A, STEREO B, Satellites
1	SX	Solar Anomalous and Magnetospheric Particle Explorer, SAMPEX, Satellite
1	TIMED	Thermosphere-Ionosphere-Mesosphere Energetics and Dynamics Satellite
2	TWINS[12]	Two Wide-angle Imaging Neutral-atom Spectrometer, TWINS 1, TWINS 2, Satellites
22	UY	Ulysses Satellite
7	WI	Wind Satellite, ISTP Program
151	Total	

ADAPT - Merits and VSPO Content Summary

- Rapid iteration and generation of high quality SPASE data descriptions. Minimization of human error.

- ADAPT lowers Impact on Personnel during Review and Registration.

- ADAPT is schema independent – Proof of concept: ADAPT generated SPASE Simulation Extension IDL Programs.

- ADAPT can be used for any self-describing data types given the metadata can be read reliably

19	ACE
2	AMPTE-CCE
6	Alouette2
288	BARREL
1	Cassini
1	DE1
1	DE2
6	DMSP_5D-3
2	ELFIN
6	FAST
2	Helios1
2	Helios2
2	ISEE3
15	ISIS1
23	ISIS2
3	ISS
1	Interball
2	MAVEN
228	MMS
3	NewHorizons
3	OGO
1	OMNI
6	POLAR
1	Pioneer10
62	RBSP
9	RENU2
3	SOHO
10	STEREO-A
8	STEREO-B
191	THEMIS
17	TIMED
2	TWINS1
2	TWINS2
9	Ulysses
51	Voyager1
89	Voyager2