PDS4 Data Within the PSA – A Cross-Mission and Cross-Discipline Approach to a PDS4 Archive

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Bundles – The PSA Approach

- PSA is a multi-discipline and multi-mission archive:


cassini-huygens


mars express


venus express


smart-1


giotto


rosetta

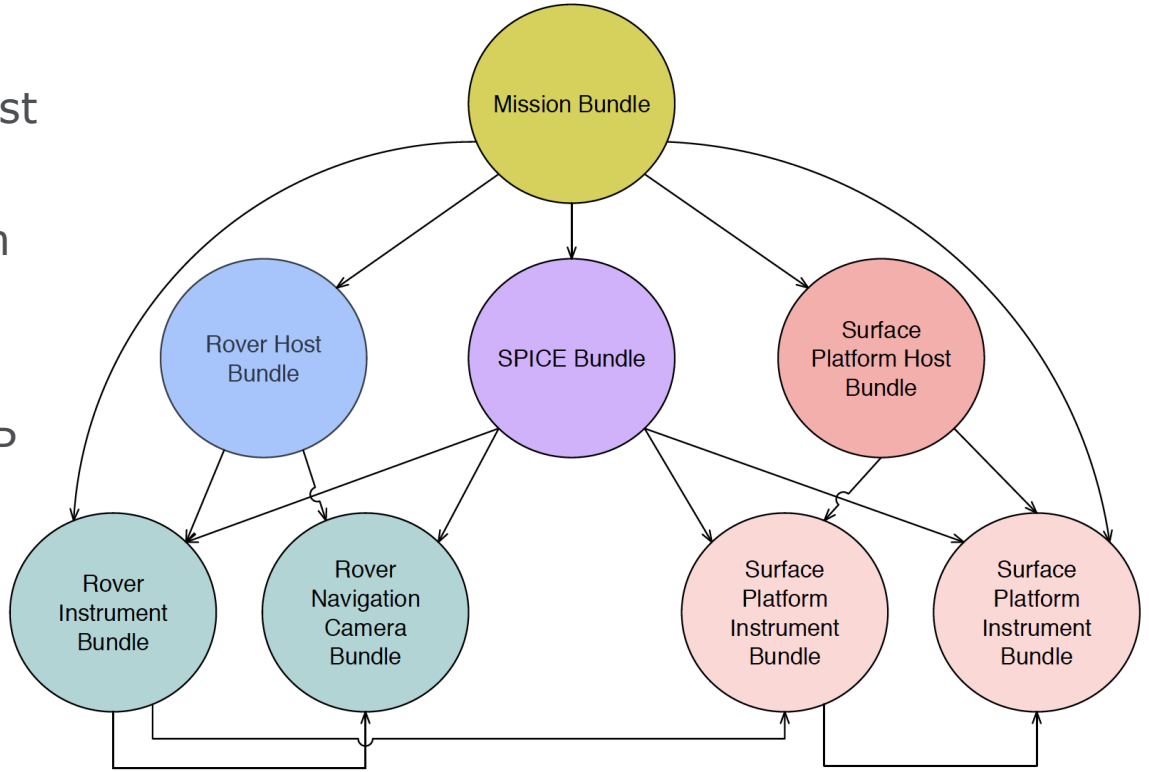

juice


exomars

- On moving to PDS4 we decided to impose some common approaches:
- We agreed to have:
  - **Common cross-mission bundle structures**
  - **PSA data dictionary to store cross-mission metadata**
  - **Some PSA policies regarding use of PDS4 e.g. use of Target**

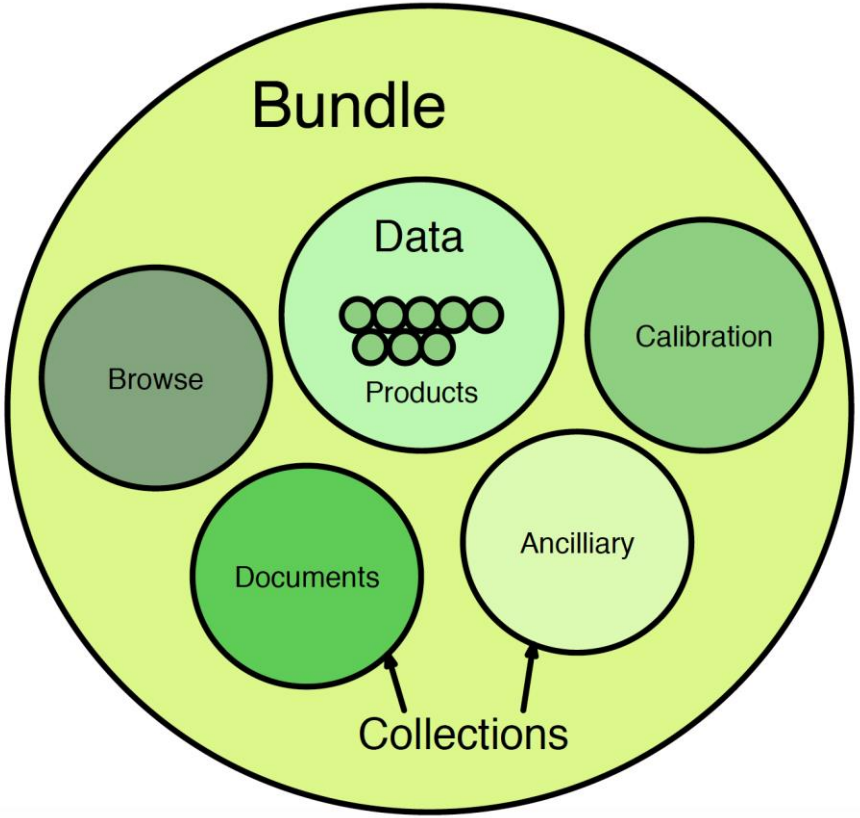
Bundles – PSA Implementation

- One Bundle for the mission
- If needed one bundle per host
  - Necessary for Rover and Surface Platform
- One bundle for SPICE per mission or host
  - TBD for ExoMars RSP
- One bundle for each instrument

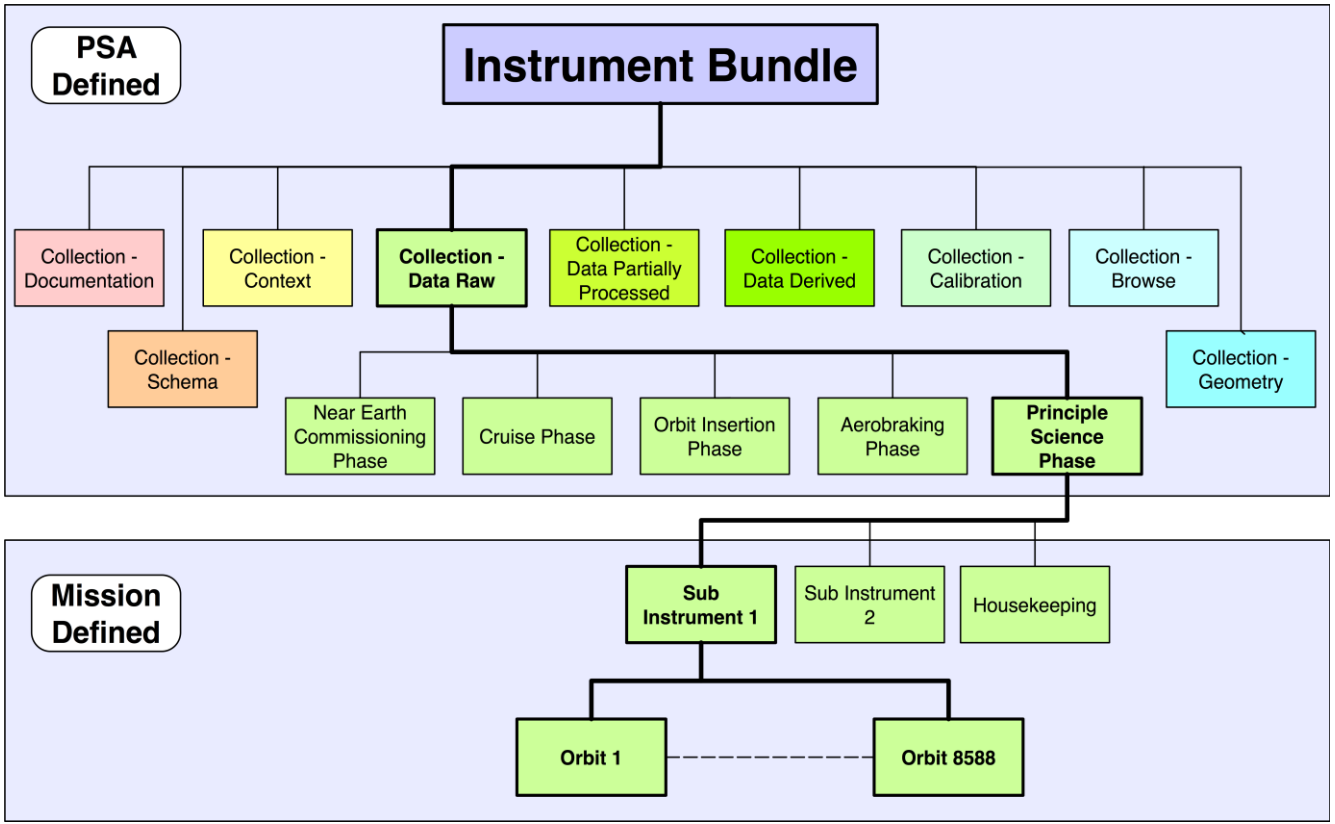


Bundles – PSA Implementation

Collections are standardised by the PSA as being formed and named by data type



EM16 Instrument Bundle



The PSA also prefers data to be separated by mission phase

Then separation by sub-instrument including HK

Collections

- Data_Raw
- Data_Partially_Processed
- Data_Calibrated
- Data_Derived
- Browse
- Geometry
- Calibration
- Document
- Context
- Schema
- Miscellaneous_Ancillary

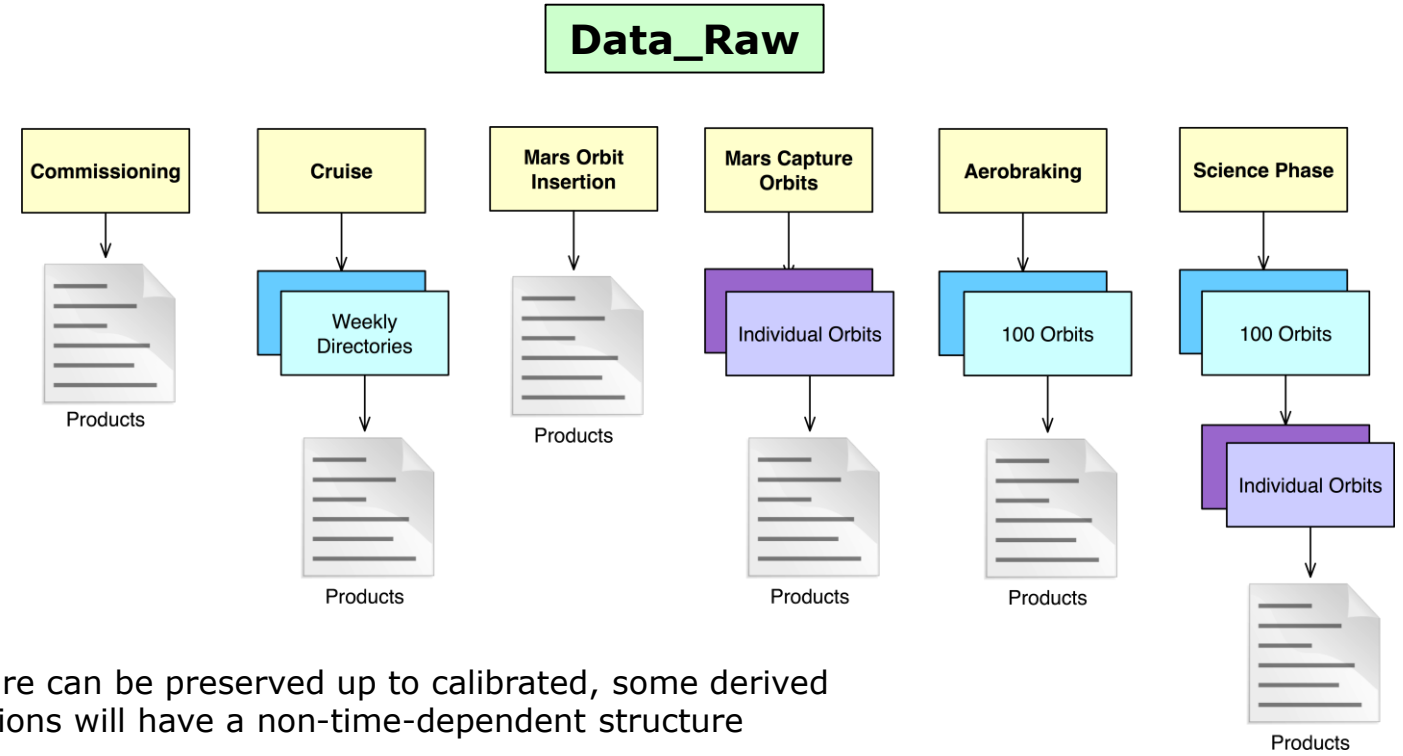
Browse may be split by data processing level e.g. Browse_Raw etc.

Up to Calibrated level one Collection is preferred. More flexibility is given for Derived but is on a case by case basis.

Geometry is optional

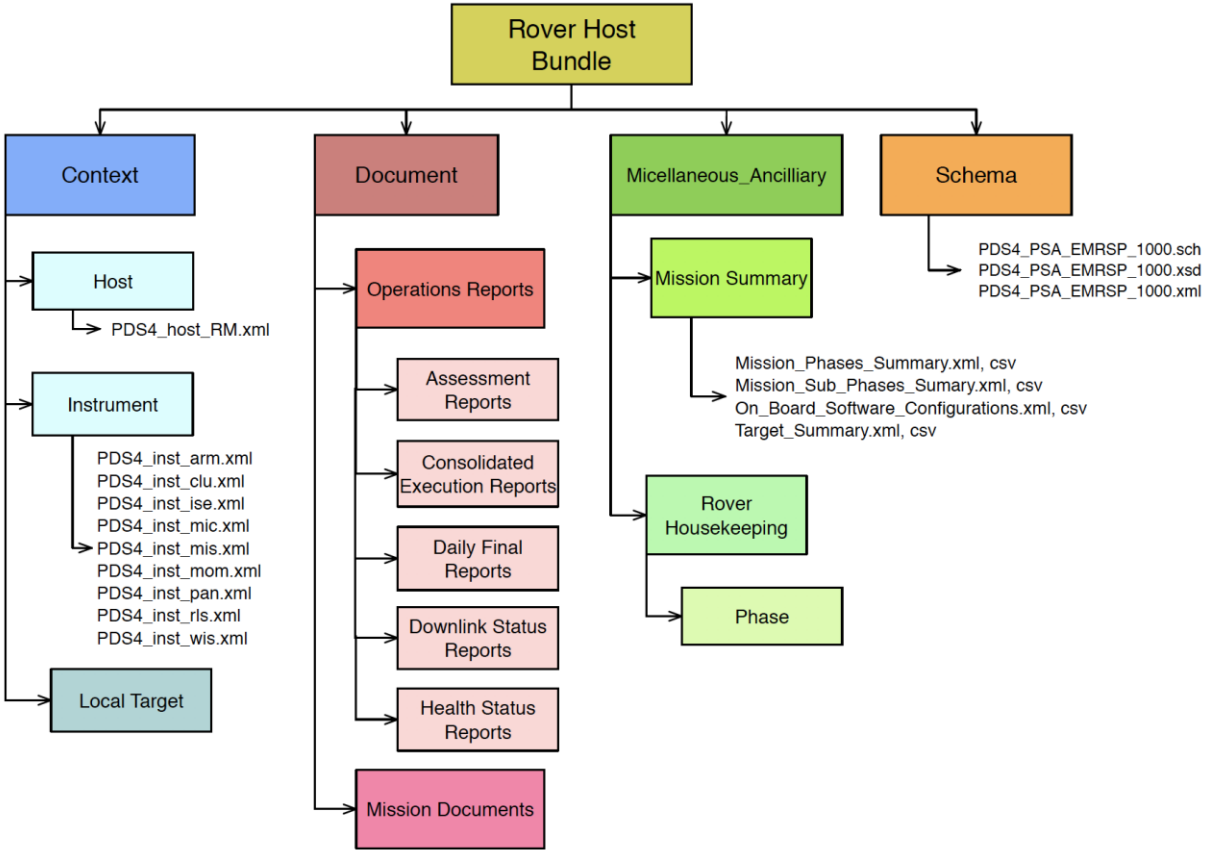
Miscellaneous_Ancillary may be used for TCH

EM16 Example Sub-division by phase



This structure can be preserved up to calibrated, some derived data collections will have a non-time-dependent structure

The ExoMars 2020 Rover Host Bundle (So Far…)



Logical Identifiers

- PSA Namespace urn:esa:psa

- Mission: urn:esa:psa:emrsp
- Rover Bundle: urn:esa:psa:emrsp_rm
- Rover Instrument Bundle: urn:esa:psa:emrsp_rm_clu
- Rover Instrument Collection: urn:esa:psa:emrsp_rm_clu:document
- Rover Instrument Product: urn:esa:psa:emrsp_rm_clu:document:document_name

- Context LIDS:
- Mission: urn:esa:psa:context:investigation:mission.emrsp
- Host: urn:esa:psa:context:instrument_host:spacecraft.rm
- Instrument: urn:esa:psa:context:instrument:clupi.rm

Local Dictionaries:

- **PSA:** Schema and Schematron

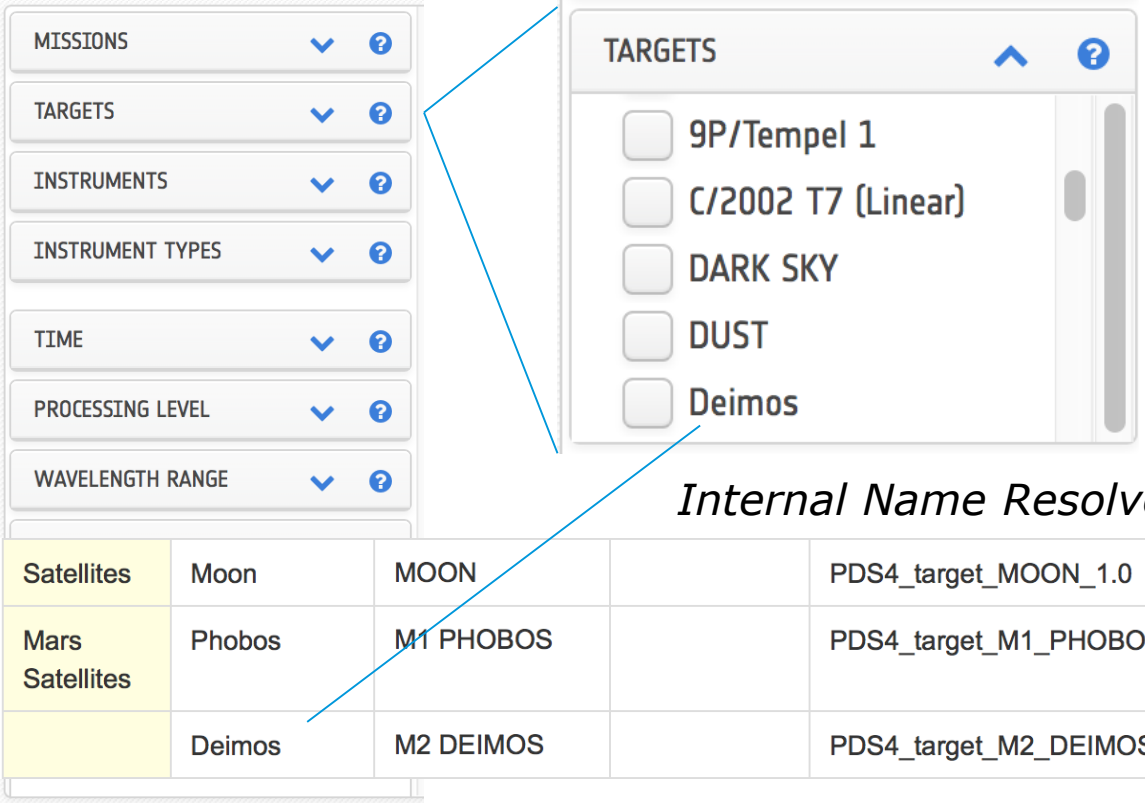
- ExoMars 2016 Mission: Schematron only (to PSA Schema e.g. mission phase)
- ExoMars 2016 TGO Host: Nothing planned
- ExoMars 2016 Instruments: Schema only (so far) for 3 instruments

- Bepi Mission: Schema only (so far)

- ExoMars 2020 Mission: Schema (TBW, only for host context?)
- ExoMars 2020 Rover Host: Schema and Schematron
- ExoMars 2020 Instrument: Schema for 2 instruments (first draft)

- *We are not yet using LDD Tool, this is being tested*

Searchability



PSA Targets

- PDS4_target_HD_15318_1.1.xml
- PDS4_target_HD_30739_1.1.xml
- PDS4_target_HD_42560_1.1.xml
- PDS4_target_HD_48915_1.0.xml
- PDS4_target_HD_100889_1.1.xml
- PDS4_target_HD_172167_1.0.xml
- PDS4_target_LANDOLT_SA_92_1.0.xml
- PDS4_target_LANDOLT_SA_104_1.0.xml
- PDS4_target_PLEIADES_1.0.xml

Internal Name Resolver

Satellites	Moon	MOON		PDS4_target_MOON_1.0		None
Mars Satellites	Phobos	M1 PHOBOS		PDS4_target_M1_PHOBOS_1.0	M1	PDS4_target_PHOBOS_1.0
	Deimos	M2 DEIMOS		PDS4_target_M2_DEIMOS_1.0	M2	PDS4_target_DEIMOS_1.0

PSA proposal for instrument-types: 39

In-situ and Radio

- Radio science
- Radar
- Magnetometer
- Radiometer
- Particle detector
- Dust analyser
- Active plasma experiment
- Spectral power receiver
- Waveform receiver
- Electric field instrument
- Plasma analyser
- Sounder

Remote sensing-like

- Imager
- Imaging spectrometer
- Spectrometer
- Mass spectrometer
- Neutron detector
- Gamma ray detector
- Altimeter
- Polarimeter

Laboratory-like

- Microscope
- Surface tool
- Sub-surface tool
- Biology experiment
- Weather station
- Gas analyser
- Sensor suite
- Chemistry laboratory
- Temperature sensor

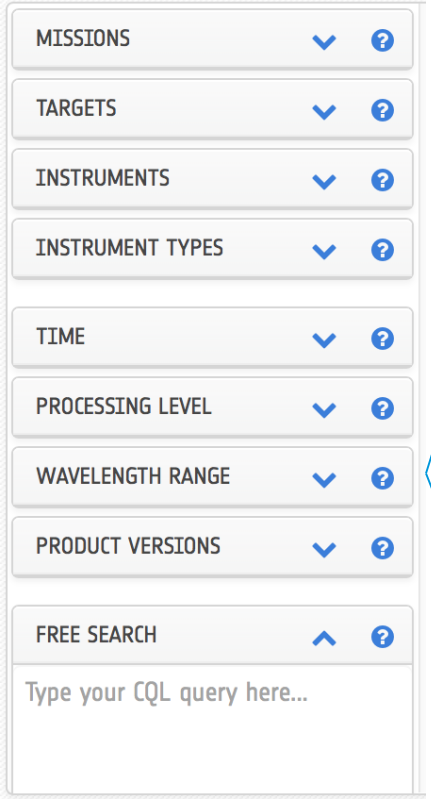
Others

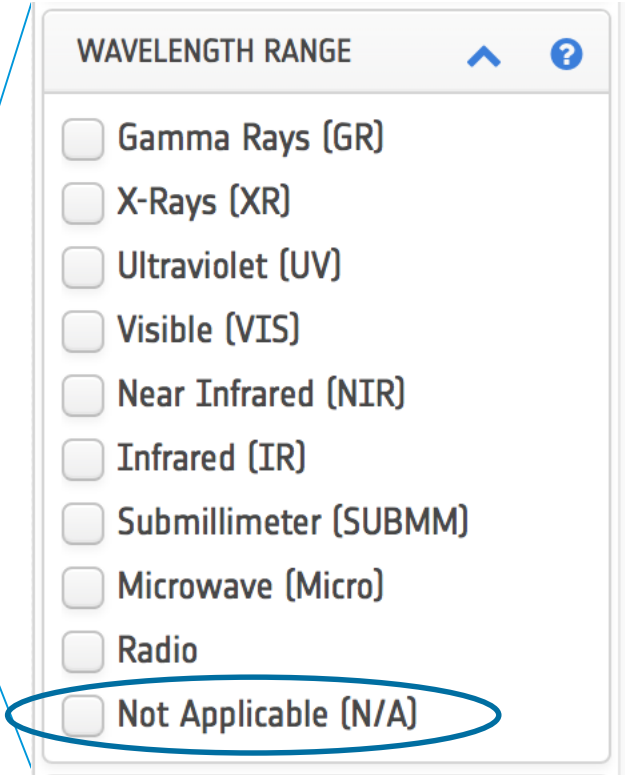
- Seismometer
- Interferometer
- Gravimeter
- Spectrograph
- SPICE kernels
- Compilation
- N/A

Hardware

- Accelerometer
- Spacecraft sensors
- Microphone

Searchability

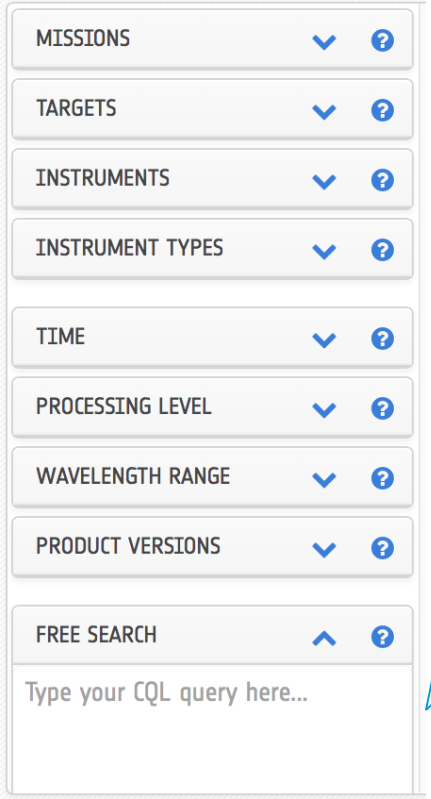




Wavelength Range in Science Facets

- Gamma Ray
- X-ray
- Ultraviolet
- Visible
- Near Infrared (0.65 and 5.0)
- Far Infrared (30-300)
- Infrared (0.75-300)
- Submillimeter
- Microwave
- Millimeter
- Radio

Searchability



CASSIS Instrument:

- cassis_off_nadir_angle
- phase_angle_filter
- incidence_angle_filter
- emission_angle_filter
- sub_cassis_longitude
- sub_cassis_latitude
- filter

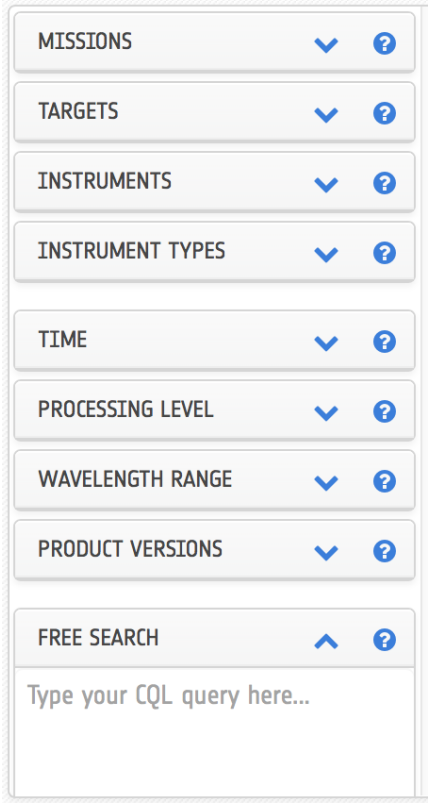
product_class = 'Product_Observational' AND instrument_name = 'ACS'

start_date_time > '2016-12-01' AND stop_date_time < '2016-12-10'

PDS:

- spacecraft_target_subspacecraft_distance
- phase_angle
- solar_longitude
- spacecraft_heliocentric_distance
- solar_elongation
- subsolar_longitude
- subsolar_latitude

Future Plans



- Expand CQL search to all metadata
  - This will be implemented incrementally
- Ability to save searches in a user profile
- Expand the Filter Menu
  - *Instrument views (far future)*
- Improved Data Distribution for PDS4
- Viewer for PDS4 labels
- New UIs – Planet/Comet Surface views, Rover Track