EPNcore DataModel v2.0

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EPNcore / Obscore

- Obscore = unified global data discovery and access for astronomy resources
- EPNcore = same for solar and planetary sciences
- Why two standards?
  - Obscore is dedicated to RA/Dec and observation of photons
  - in Solar System observations most observation axes are “resolved”: ranges are needed for all parameters
  - Search by target name, by location on a target
  - In-situ observations, not only photons…
- We propose a “flat schema”, with parameters grouped by physical parameter type. (Valid!) XSD schema is available, including links to STC types.
- **The proposition presented here is a new version (v2.0) as compared to published version (v1.0) in Astronomy and Computing**.
- **Wish**: getting an ivo-id for EPNcore DM.
- Validator at VOParis (see with P. Le Sidaner): TAP validation using TAPLINT, and we add check on EPNcore keywords/ucd/units.

EPNcore — Resource

- **publisher**:
  Publisher from VOResource
  vr:ResourceName

- **title**:
  full name given to the resource .

- **reference**:
  vr:Source

- **processing_level**:
  Now using CODMAC levels
  in future, we will go for NASA/
  PDS data levels

- publisher_id

- obs_title

- bib_reference

- calib_level
  not the same definition/values

EPNcore — Product

- **granule_uid**:
  unique id for granule in database

- **obs_id**:
  original observation id, to cross-reference granules with various processing, but from the same original observation.

- **granule_gid**:
  granule group id for granules that have same processing, coordinate system, etc, to cross-reference granules with comparable processing

- **dataproduct_type**:
  predefined list: **im** (image), **sp** (spectrum), **ds** (dynamic spectrum), **sc** (spectral cube), **pr** (profile), **vo** (volume), **mo** (movie), **cu** (cube), **ts** (timeseries), **ca** (catalog), **sv** (spatial vector)

- **instrument_host_name**:
  spacecraft of observatory name (archive names recommended).

- **instrument_name**:
  name of instrument (archive names recommended)

- **measurement_type**:
  ucd

- obs_publisher_did?
  definition are alike

- obs_id
  same definition

- obs_collection?
  very similar definition

- dataproduct_type
  predefined list: image, cube, spectrum, sed, timeseries, visibility, or event.
  same name, but not the same list!

- facility_name
  from VODataService (but no constraints)

- instrument_name

- o_ucd

EPNcore — Target

- **target_name**:
  target name, from IAU standard list

- **target_class**:
  predefined list: *star, interplanetary_medium, dust, planet, satellite, exoplanet, sample, ring, comet, sky, spacecraft, spacejunk, dwarf_planet, asteroid*

- target_name
  (which standard?)

- target_class
  (list to be defined?)

EPNcore — Temporal

- **time_min**,
  time_max:
  Time range min and max value of data product
  Unit: JD

- **time_exp_min**,
  time_exp_max:
  Exposure time min and max values of data product
  Unit: seconds

- **time_sampling_step_min**,
  time_sampling_step_max:
  Sampling step min and max values of data product
  Unit: seconds

- **time_scale**:
  stc:timeScaleType (TT, TAI…)

- **time_origin**:
  stc:stdRefPosType (named origin of time)

- t_min
  t_max
  same definition, but in MJD

- t_exptime

  single valued (no min/max)

- t_resolution

  single valued (no min/max)

EPNcore — Spectral

- **spectral_range_min**,
  spectral_range_max:
  Spectral range min and max value
  Unit: Hz

- **spectral_resolution_min**,
  spectral_resolution_max:
  Filter bandwidth min and max values
  Unit: Hz

- **spectral_sampling_step_min**,
  spectral_sampling_step_max:
  Spectral sampling min and max values
  Unit: Hz

- em_min
  em_max
  same definition, but unit in meter

- em_res_power
  not the same definition
  relative resolution here: λ/Δλ or Δf/f

EPNcore — Spatial

- **c1_min**, **c2_min**, **c3_min**,
  c1_max, **c2_max**, **c3_max**:
  Spatial ranges min and max values on 3 axes, as defined in Spatial_frame_type
  Unit: degrees or meters

- **c1_resol_min**, **c2_resol_min**, **c3_resol_min**
  c1_resol_max, c2_resol_max, c3_resol_max:
  Spatial resolutions min and max values
  Unit: degrees or meters

- **Spatial_frame_type**:
  celestial / body / cartesian / cylindrical / spherical

- **spatial_origin**:
  stc:stdRefPosType (named origin of spatial axes)

- **spatial_coordinate_description**:
  stc:coordRefFrameType

- s_ra
  s_dec
  s_fov

- s_resolution

EPNcore — Geometry

- **incidence_min**,
  incidence_max:
  The incidence angle parameters define the upper and lower bounds of the incidence angle variation in the data (also known as Solar Zenithal Angle)
  Unit: degrees (0° = normal to surface)

- **emergence_min**,
  emergence_max:
  The emergence angle parameters define the upper and lower bounds of the emergence angle variation in the data (viewing angle).
  Unit: degrees (0° = normal to surface)

- **phase_min**,
  phase_max:
  The phase angle parameters define the upper and lower bounds of the phase angle variation in the data
  Unit: degrees (0° = opposition)

- **solar_longitude**:
  parameter defining the “season” on the target at time of observation
  Unit: degrees

- **local_time**:
  sub-solar longitude on target at time of observation
  Unit: degrees (0° = midnight)

- **target_distance**:
  distance to center of target at time of observation

(no corresponding keywords in obscore)

EPNcore — Access

- **access_url**:
  URL used to download the data.

- **access_format**:
  A non-exhaustive list of formats is proposed:
  VOTable, Fits, CSV, ASCII, PDS (+ standard image formats).

- **access_estsize**:
  approximate size of data file
  Unit : kB

- **file_name**:
  name of the data file

- **preview_url**:
  URL used to get a preview of data as an image

- **thumbnail_url**:
  URL used to get a preview of data as a small sized image

- access_url

- access_format

- access_estsize

EPNcore — Particles

- **species**:
  The species parameter introduces the chemical species of interest in simple data services. The formatting is very basic and simply uses the standard formula in ascii, e. g., H2O for water, CO2 for carbon dioxide or Fe for iron.
  In future we may use InChiKeys as VAMDC here

- **particle_spectral_type**:
  This parameter and the following ones are related to the spectral distribution of particles only (see the spectral_* parameters for electro-magnetic waves).
  The particle_spectral_type parameter introduces the type of axis in use:
  - either energy (provided in eV),
  - mass (in amu),
  - or mass/charge ratio (in amu/qe).

- **particle_spectral_range_min**, **particle_spectral_range_max**:
  upper and lower bounds of the spectral domain for particles.
  Unit: eV, amu, or amu/qe.

  (no corresponding keywords in obscore)

- **particle_spectral_sampling_step_min**, **particle_spectral_sampling_step_max**:
  upper and lower bounds of the spectral sampling steps for particles.
  Unit: eV, amu, or amu/qe.

- **particle_spectral_resolution_min**, **particle_spectral_resolution_max**:
  upper and lower bounds of the spectral bandwidth for particles.
  Unit: eV, amu, or amu/qe.

Work Plan

- EPN-TAP document is being drafted. Last details to be worked out soon. Will then be sent to DM chair.
- XSD schema is already available. UML will soon be there. VO-DML may also be provided (with interaction with DM working group).
- Getting an ivo-id for EPNcore DM, in order to declare our EPN-TAP services in the registry.
- Validator at VOParis (see with P. Le Sidaner):
  - TAP validation using TAPLINT,
  - additional check on EPNcore keywords/ucd/units.