

# UCD for Planetary Sciences

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# Plasma environment modeling

- **New identified needs**

- magnetic potential vector.

- `phys.magfield;phys.potential` OR **`phys.magfield.potentialvector`**

- electric current density (total current density of all charged particles: electrons, protons, ions...)

- `phys.flux;phys.atmol.ionstage` is not satisfactory.

# Spectroscopic and photometric measurements

- **Note**

In Spectrum DM, spectral dependencies are given in UCD. For instance:

- Flux Density per unit wave: `phys.flux.density;em.wl`

- Surface Brightness per unit frequency: `phys.flux.density.sb;em.freq`

Is this something that we want to keep for the future?

- **New identified needs**

- Illumination map: fraction of total input flux received on a given location of a planetary surface.

- reflectance vs albedo: Albedo is a spectrally integrated value, where as reflectance is characterizing the spectral variation of the reflection properties.

  - `phys.albedo;em.wl` ? OR **`phys.reflectance`**

- Radiance: an intrinsic property of source characterizing the radiated flux in a given direction. Unit is  $W/m^2/sr$ ,  $W/m^2/sr/nm$  for spectral radiance (wl in nm).

  - `phys.luminosity;phys.angArea;em.wl` ? OR **`phys.radiance;em.wl`**

*NB: change `phot.radiance` to `phys.radiance` ? (this is an intrinsic property, not observed quantity)*

# Illumination conditions

- **Note**  
only `pos.phaseAngle` available.
- **New identified needs**
  - Incidence angle. Same as “solar zenithal angle”  
**`pos.incidenceAng`**
  - Emergence angle:  
**`pos.emergenceAng`**
  - Azimuth angle:  
**`pos.azimuthAng`**
- **Lab Experiments**  
More detailed study required.

# Coordinates and ephemeris (1)

- **Coordinates**

- planetary magnetospheric coordinates use colatitude and not latitude.

- pos.bodyrc.colat**

- **Orbital Parameter**

- perifocal distance:

- pos.distance;src.orbital.perifocal**

- **Generic coordinate systems**

- current coordinate systems in “pos.” UCDs are: AZ, BodyRC, Cartesian, Earth, Ecliptic, EQ, Galactic.

- Adding generic cylindrical system would be useful:

- pos.cylindrical.r / pos.cylindrical.th / pos.cylindrical.z**

# Coordinates and ephemeris (2)

- **Vector or matrix components**

- Adding a way to say “this a component of a vector or a matrix, and not the full set of information”:

- phys.component**

- **Rotation parameter description**

- necessary for describing attitude and orientation parameters

- pos.rotation.eulerAng**

- pos.rotation.quaternion**

- pos.rotation.matrix**

- pos.rotation.axis**

- **More info here**

- <https://voparis-confluence.obspm.fr/display/VES/VESPA+Contribution+to+NASA-JPL+WebGeoCalc+tool>

# EPN TAP keywords

- **Spatial Resolution**

- We need spatial resolution (spatial sampling: in situ or projected on target) and angular resolution

- pos.resolution**

- pos.angResolution**

- **Heliospheric coordinates**

- There is a heliocentric related UCD, but it is a generic reference frame qualifier. Adding heliocentric longitude coordinates would be useful.

- pos.heliocentric.lon**

- while there, let's add also heliocentric latitude.

- pos.heliocentric.lat**

# Metadata

- **New identified needs**

- checksums: MD5 hash

- `meta.cryptic;meta.file (?)` OR `meta.checksum;meta.file`

- modification date

- `time.processing;meta.file` OR `time.update;meta.file`

- to be compared with creation date

- `time.creation;meta.file`

- and release date

- `time.release;meta.file`



# Status and update of UCD

- What is the status of the UCD update discussed last year?
- What is the result of the tests done with provided examples?
- Dedicated working group needed?