UCD for Planetary Sciences

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Previous proposal (1)

http://wiki.ivoa.net/internal/IVOA/PlanetaryUCD/WD-UCDlist-1.24-20140901.pdf

Additions:

	New UCD word	Description
Q	em.freq.cutoff	Cutoff frequency
Q	em.freq.resonance	Resonance frequency
S	em.line.C2	C2 line
S	em.line.C3	C3 line
S	em.line.C4	C4 line
S	em.line.CH	CH line
S	em.line.CH4	CH4 line or band
S	em.line.CN	CN line
S	em.line.CO2	CO2 radio line
S	em.line.FeKalpha	Fe K-alpha line
S	em.line.H2O	H2O line or band
S	em.line.K-7699	K line at 7699
S	em.line.NH2	NH2 line or band
S	em.pw	Plasma waves (trapped in local medium)
S	em.radio.20MHz	Radio below 20 MHz
S	em.radio.20-50MHz	Radio between 20 and 50 MHz
S	em.radio.50-100MHz	Radio between 50 and 100 MHz
Q	instr.experiment	Experiment or group of instruments

Previous proposal (2)

Q	meta.calibLevel	Processing/calibration level
S	obs.calib.dark	Related to dark current calibration
S	obs.occult	Observation of occultation phenomenon by solar system objects
S	obs.transit	Observation of transit phenomenon : exo-planets
E	phot.radiance	Radiance as energy flux per solid angle
S	phys.aerosol	Relative to aerosol
Q	phys.density.phaseSpace	Density in the phase space
S	phys.dust	Relative to dust
Q	phys.flux	Flux or flow of particle , energy, etc.
Q	phys.flux.energy	Energy flux, heat flux
S	phys.particle	Related to physical particles
S	phys.particle.neutron	Related to neutron
S	phys.particle.proton	Related to proton
S	phys.particle.alpha	Related to alpha particle
S	phys.phaseSpace	Related to phase space
Q	phys.potential	Potential (electric, gravitational, etc)
Q	phys.size.smedAxis	Linear semi median axis for 3D ellipsoids
Q	phys.volume	Volume (in cubic units)
Q	src.orbital.Tisserand	Tisserand parameter (generic)
Q	src.orbital.TissJ	Tisserand parameter with respect to Jupiter
Q	time.period.revolution	Period of revolution of a body around a primary one (similar to year)
Q	time.period.rotation	Period of rotation of a body around its axis (similar to day)

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?