International

Virtual

Observatory

Alliance

The UCD1+ controlled vocabulary Version 1.3

Update for Planetary and Solar data

IVOA Working Draft 2016 July 18

This version:

http://wiki.ivoa.net/internal/IVOA/PlanetaryUCD/WD-UCDlist-1.3-20160718.pdf

Latest version:

http://wiki.ivoa.net/internal/IVOA/PlanetaryUCD/WD-UCDlist-1.3-20150608.pdf

Previous version(s):

http://www.ivoa.net/Documents/REC/UCD/UCDlist-20070402.html

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Abstract

This document describes the list of controlled terms used to build the Unified Content Descriptors, Version 1+ (UCD1+). The document describing the UCD1+ can be found at the URL: http://www.ivoa.net/Documents/latest/UCD.html. This document reviews the structure of the UCD1+ and presents the current vocabulary.

This version contains new UCD words for the planetary data community as proposed in the Technical Note by Cecconi et al. [3]. The suggested list of line labels under the `em.line` branch is not included. A general solution is currently under study to deal with lists of element instances such spectral lines, chemical elements, elementary particles, etc. using either utypes or a vocabulary.

Status of This Document

This is an IVOA Working Draft. The first release of this document was 2014 August 21 under version 1.23, updated to 1.3 for consistency with the version numbering rules.

This document is an IVOA Working Draft for review by IVOA members and other interested parties. It is a draft document and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use IVOA Working Drafts as reference materials or to cite them as other than "work in progress".

A list of current IVOA Recommendations and other technical documents can be found at http://www.ivoa.net/Documents/.

Acknowledgements

This document is based on the W3C documentation standards as adapted for the IVOA.

Contents

1   Definition of atoms and words

A UCD is a string which contains textual tokens called 'words', separated by semicolons(;). A word is composed of 'atoms', separated by periods(.). The hierarchy is as follows:

atoms --> words --> composed words

UCD1+ are either single words, or a composition of several words.

UCDs are "controlled" through a process defined in the IVOA. See reference [4] and section 1.2 below. Control is exercised at the level of words (UCD1+) and at the level of the vocabulary (atoms) used to form words. A consistent list of atoms will be maintained, making sure that the same atom always means the same thing, even if used in combination with different other atoms.

1.1 Definition of atoms

Atoms are defined following these guidelines:

1. Abbreviations are used in contexts where their meaning is unambiguous. (**ra**, **dec** are acceptable, but **t** is ambiguous: **time** and **temperature** are used instead.)

2. Atoms are not hyphenated. The separation is marked by a capital letter to help readability (position angle = **posAng**) unless the composed word has a well known acronym (signal to noise ratio = **snr**) or short form (standard deviation = **stdev**). There are only two exceptions to this rule: (i) the X-ray band (**em.X-ray**) and (ii) the frequency / wavelength intervals defining regions of the e.m. spectrum (e.g. **em.radio.3-6GHz**).

1.2 Definition of words

The list of UCD1+ words presented in this document was initially generated applying the rules and recommendations of PR-UCD-20040823 to catalogues/tables in VizieR. The original motivation was to transform old UCD1 into an improved version, trying to build a list of combinations of new words that could describe all the existing UCD1 terms.

The list of UCD1+ words is maintained by the UCD Scientific Board, following the procedure defined in the UCD Recommendation document [4] and described in detail in http://www.ivoa.net/Documents/latest/UCDlistMaintenance.html[1] .

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[1] An earlier draft of this document, still at http://www.ivoa.net/documents/PR/UCD/UCD-20040823.html includes more details about the process of the change from the earlier "UCD1" standard, and may be of historical interest, or provide more rationale.

2   The structure of the UCD1+ tree

All existing UCD1+ words are grouped into 12 main categories. These categories are expressed by the first atom of the word, whose possible values are:

1. **arith** (arithmetics)

   This section includes concepts involving or indicating some mathematical operation performed on the primary 'concept' or just the presence of an arithmetic factor or operator.

2. **em** (electromagnetic spectrum)

   This section describes the electromagnetic spectrum, either in a monochromatic way or in predefined intervals. The complete list of proposed bands (in seven classical regions of the e.m. spectrum: radio, millimeter, infrared, optical, ultraviolet, x-ray and gamma-ray), can be found in the document Note-EMSpectrum-20040520

3. **instr** (instrument)

   This section includes all quantities related to astronomical instrumentation, e.g. detectors (plates, CCDs, etc.), spectrographs, and telescopes (including observatories or missions), etc.

4. **meta** (metadata)

   This section includes all the information that is not coming directly from a measurement, and information that could not be included in other sections.

5. **obs** (observation)

   In principle under this section should go all words describing an observation (the name of the observer or PI, the observing conditions, the name of the field). In practice, the section is very 'thin' and could be deleted, if the sparse content could be housed elsewere.

6. **phot** (photometry)

   All the words describing photometric measures are included in this section. The definitions distinguish between a flux density (flux per unit frequency interval), a flux density integrated over a given e.m. interval (flux if expressed linearly, mag if expressed by a log), or a flux expressed in counts/s (if the setup of the detector is photon counting observing mode). 'Colors', which are differences of magnitudes (i.e. ratios of fluxes) measured in different bandpasses, are also included.

7. **phys** (physics)

This section includes atomic and molecular data (mainly used for spectroscopy) and basic physical quantities (temperature, mass, gravity, luminosity, etc.)

8. **pos** (positional data)

   This section describes all quantities related to the position of an object on the sky:

   - Angular coordinates, and projections from spherical to rectangular systems.
   - Angular measurements in general ~~(the angular size of an object is in this section, its linear size is in the **phys** section).~~
   - The WCS FITS keywords.

9. **spect** (spectral data)

   For historical reasons, photometric data taken in narrow spectral bands with instruments called spectrographs are classified as spectroscopic data. These definitions should not be confused with those in the **em** category. **em** represents the independent variable, or dispersion axis, and **phot** and **spect** describe the dependent variable, or flux axis.

10. **src** (source)

    This is a rather generic section, mainly devoted to source classifications. Variability, orbital, and velocity data are also included in this section.

11. **stat** (statistics)

    This section includes statistical information on measurements.

12. **time** (time)

    Quantities related to time (age, date, period, etc.) are described in this section.

Appendix A: List of valid words

All words are preceded by a 'syntax' code that can help in the process of building composed UCD1+.

1. The code "P" means that the word can only be used as "primary" or first word;
2. "S" stands for only secondary: the word cannot be used as the first word to describe a single quantity;
3. "Q" means that the word can be used indifferently as first or secondary word;

4. "E" means a photometric quantity, and can be followed by a word describing a part of the electromagnetic spectrum
5. "C" is a colour index, and can be followed by two successive word describing a part of the electromagnetic spectrum;
6. "V" stands for vector. Such a word can be followed by another describing the axis or reference frame in which the measurement is done

Q	arith	Arithmetic quantities
S	arith.diff	Difference between two quantities described by the same UCD
P	arith.factor	Numerical factor
P	arith.grad	Gradient
P	arith.rate	Rate (per time unit)
S	arith.ratio	Ratio between two quantities described by the same UCD
S	arith.squared	Squared quantity
S	arith.sum	Summed or integrated quantity
S	arith.variation	Generic variation of a quantity
Q	arith.zp	Zero point
S	em	Electromagnetic spectrum
S	em.IR	Infrared part of the spectrum
S	em.IR.J	Infrared between 1.0 and 1.5 micron
S	em.IR.H	Infrared between 1.5 and 2 micron
S	em.IR.K	Infrared between 2 and 3 micron
S	em.IR.3-4um	Infrared between 3 and 4 micron
S	em.IR.4-8um	Infrared between 4 and 8 micron
S	em.IR.8-15um	Infrared between 8 and 15 micron
S	em.IR.15-30um	Infrared between 15 and 30 micron
S	em.IR.30-60um	Infrared between 30 and 60 micron
S	em.IR.60-100um	Infrared between 60 and 100 micron
S	em.IR.NIR	Near-Infrared, 1-5 microns
S	em.IR.MIR	Medium-Infrared, 5-30 microns
S	em.IR.FIR	Far-Infrared, 30-100 microns
S	em.UV	Ultraviolet part of the spectrum
S	em.UV.10-50nm	Ultraviolet between 10 and 50 nm EUV extreme UV
S	em.UV.50-100nm	Ultraviolet between 50 and 100 nm
S	em.UV.100-200nm	Ultraviolet between 100 and 200 nm FUV Far UV
S	em.UV.200-300nm	Ultraviolet between 200 and 300 nm NUV near UV
S	em.X-ray	X-ray part of the spectrum
S	em.X-ray.soft	Soft X-ray (0.12 - 2 keV)
S	em.X-ray.medium	Medium X-ray (2 - 12 keV)
S	em.X-ray.hard	Hard X-ray (12 - 120 keV)
Q	em.bin	Channel / instrumental spectral bin coordinate (bin number)
Q	em.energy	Energy value in the em frame
Q	em.freq	Frequency value in the em frame
Q	em.freq.cutoff	cutoff frequency
Q	em.freq.resonance	resonance frequency
S	em.gamma	Gamma rays part of the spectrum
S	em.gamma.soft	Soft gamma ray (120 - 500 keV)
S	em.gamma.hard	Hard gamma ray (>500 keV)
S	em.line	Designation of major atomic lines
S	em.line.HI	21cm hydrogen line
S	em.line.Lyalpha	H-Lyalpha line
S	em.line.Halpha	H-alpha line
S	em.line.Hbeta	H-beta line
S	em.line.Hgamma	H-gamma line

S	em.line.Hdelta	H-delta line
S	em.line.Brgamma	Bracket gamma line
S	em.line.OIII	[OIII] line whose rest wl is 500.7 nm
S	em.line.CO	CO radio line , e.g 12CO(1-0)at 115GHz
S	em.mm	Millimetric/submillimetric part of the spectrum
S	em.mm.30-50GHz	Millimetric between 30 and 50 GHz
S	em.mm.50-100GHz	Millimetric between 50 and 100 GHz
S	em.mm.100-200GHz	Millimetric between 100 and 200 GHz
S	em.mm.200-400GHz	Millimetric between 200 and 400 GHz
S	em.mm.400-750GHz	Millimetric between 400 and 750 GHz
S	em.mm.750-1500GHz	Millimetric between 750 and 1500 GHz
S	em.mm.1500-3000GHz	Millimetric between 1500 and 3000 GHz
S	em.opt	Optical part of the spectrum
S	em.opt.U	Optical band between 300 and 400 nm
S	em.opt.B	Optical band between 400 and 500 nm
S	em.opt.V	Optical band between 500 and 600 nm
S	em.opt.R	Optical band between 600 and 750 nm
S	em.opt.I	Optical band between 750 and 1000 nm
S	em.pw	Plasma waves (trapped in local medium)
S	em.radio	Radio part of the spectrum
S	em.radio.20MHz	Radio below 20 MHz
S	em.radio.20-100MHz	Radio between 20 and 100 MHz
S	em.radio.100-200MHz	Radio between 100 and 200 MHz
S	em.radio.200-400MHz	Radio between 200 and 400 MHz
S	em.radio.400-750MHz	Radio between 400 and 750 MHz
S	em.radio.750-1500MHz	Radio between 750 and 1500 MHz
S	em.radio.1500-3000MHz	Radio between 1500 and 3000 MHz
S	em.radio.3-6GHz	Radio between 3 and 6 GHz
S	em.radio.6-12GHz	Radio between 6 and 12 GHz
S	em.radio.12-30GHz	Radio between 12 and 30 GHz
Q	em.wavenumber	Wavenumber value in the em frame
Q	em.wl	Wavelength value in the em frame
Q	em.wl.central	Central wavelength
Q	em.wl.effective	Effective wavelength
Q	instr	Instrument
E	instr.background	Instrumental background
Q	instr.bandpass	Bandpass (e.g.: band name) of instrument
Q	instr.bandwidth	Bandwidth of the instrument
Q	instr.baseline	Baseline for interferometry
S	instr.beam	Beam
Q	instr.calib	Calibration parameter
S	instr.det	Detector
Q	instr.det.noise	Instrument noise
Q	instr.det.psf	Point Spread Function
Q	instr.det.qe	Quantum efficiency
Q	instr.dispersion	Dispersion of a spectrograph
Q	instr.experiment	Experiment or group of instruments
S	instr.filter	Filter
S	instr.fov	Field of view
S	instr.obsty	Observatory, satellite, mission
Q	instr.obsty.seeing	Seeing
Q	instr.offset	Offset angle respect to main direction of observation
Q	instr.order	Spectral order in a spectrograph
Q	instr.param	Various instrumental parameters
S	instr.pixel	Pixel (default size: angular)
S	instr.plate	Photographic plate
Q	instr.plate.emulsion	Plate emulsion
Q	instr.precision	Instrument precision
Q	instr.rmsf	Rotation Measure Spread Function
Q	instr.saturation	Instrument saturation threshold

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Q | instr.scale                | Instrument scale (for CCD, plate, image)
Q | instr.sensitivity          | Instrument sensitivity, detection threshold
Q | instr.setup                | Instrument configuration or setup
Q | instr.skyLevel             | Sky level
Q | instr.skyTemp              | Sky temperature
Q | instr.tel                  | Telescope
Q | instr.tel.focalLength       | Telescope focal length
S | instr.voxel                | Related to a voxel ( n-D volume element with n>2)
P | meta                       | Metadata
P | meta.abstract             | Abstract (of paper, proposal,etc.)
P | meta.bib                   | Bibliographic reference
P | meta.bib.author           | Author name
P | meta.bib.bibcode          | Bibcode
P | meta.bib.fig              | Figure in a paper
P | meta.bib.journal          | Journal name
P | meta.bib.page             | Page number
P | meta.bib.volume           | Volume number
Q | meta.calibLevel           | Processing/calibration level
P | meta.code                 | Code or flag
P | meta.code.class           | Classification code
P | meta.code.error           | limit uncertainty error flag
P | meta.code.member          | Membership code
P | meta.code.mime            | MIME type
P | meta.code.multip          | Multiplicity or binarity flag
P | meta.code.qual            | Quality, precision, reliability flag or code
P | meta.code.status          | Status code (e.g.: status of a proposal/observation)
P | meta.cryptic              | Unknown or impossible to understand quantity
P | meta.curation             | Identity of man/organization responsible for the data
Q | meta.dataset              | Dataset
Q | meta.email                | Curation/contact e-mail
S | meta.file                 | File
S | meta.fits                 | FITS standard
P | meta.id                   | Identifier, name or designation
P | meta.id.assoc             | Identifier of associated counterpart
P | meta.id.CoI               | Name of Co-Investigator
P | meta.id.cross             | Cross identification
P | meta.id.parent            | Identification of parent source
P | meta.id.part              | Part of identifier, suffix or sub-component
P | meta.id.PI                | Name of Principal Investigator or Co-PI
S | meta.main                 | Main value of something
S | meta.modelled             | Quantity was produced by a model
P | meta.note                 | Note or remark (longer than a code or flag)
P | meta.number               | Number (of things; e.g. nb of object in an image)
Q | meta.preview              | Related to a preview operation for a dataset
Q | meta.query                | Related to query posed to an information system or
                                database
P | meta.record               | Record number
P | meta.ref                  | Reference, or origin
Q | meta.ref.ivorn            | IVORN, Int. VO Resource Name (ivo://)
Q | meta.ref.uri              | URI, universal resource identifier
P | meta.ref.url              | URL, web address
S | meta.software            | Software used in generating data
S | meta.table                | Table or catalogue
P | meta.title                | Title or explanation
Q | meta.ucd                  | UCD
P | meta.unit                 | Unit
P | meta.version              | Version
S | obs                       | Observation
Q | obs.airMass               | Airmass
S | obs.atmos                 | Atmosphere, atmospheric phenomena affecting an
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                                    observation
Q | obs.atmos.extinction           | Atmospheric extinction
Q | obs.atmos.refractAngle         | Atmospheric refraction angle
S | obs.calib                      | Calibration observation
S | obs.calib.flat                 | Related to flat-field calibration observation (dome, sky, ..)
S | obs.calib.dark                 | Related to dark current calibration
S | obs.exposure                   | Exposure
S | obs.field                      | Region covered by the observation
S | obs.image                      | Image
Q | obs.observer                   | Observer, discoverer
S | obs.occult                     | observation of occultation phenomenon by solar system
                                     objects
S | obs.transit                    | observation of transit phenomenon  : exo-planets
Q | obs.param                      | various observation or reduction parameter
S | obs.proposal                   | observation proposal
Q | obs.proposal.cycle             | proposal cycle
S | obs.sequence                   | Sequence of observations, exposures or events
E | phot                           | Photometry
E | phot.antennaTemp               | Antenna temperature
Q | phot.calib                     | Photometric calibration
C | phot.color                     | Color index or magnitude difference
Q | phot.color.excess              | Color excess
Q | phot.color.reddFree            | Dereddened color
E | phot.count                     | Flux expressed in counts
E | phot.fluence                   | Radiant photon energy received by a surface per unit
                                     area or irradiance of a surface integrated over time of
                                     irradiation
E | phot.flux                      | Photon flux or irradiance
Q | phot.flux.bol                  | Bolometric flux
E | phot.flux.density              | Flux density (per wl/freq/energy interval)
E | phot.flux.density.sb           | Flux density surface brightness
E | phot.flux.sb                   | Flux surface brightness
E | phot.limbDark                  | Limb-darkening coefficients
E | phot.mag                       | Photometric magnitude
E | phot.mag.bc                    | Bolometric correction
Q | phot.mag.bol                   | Bolometric magnitude
Q | phot.mag.distMod               | Distance modulus
E | phot.mag.reddFree              | Dereddened magnitude
E | phot.mag.sb                    | Surface brightness in magnitude units
E | phot.radiance                  | Radiance as energy flux per solid angle
Q | phys                           | Physical quantities
Q | phys.SFR                       | Star formation rate
E | phys.absorption                | Extinction or absorption along the line of sight
Q | phys.absorption.coeff          | Absorption coefficient (e.g. in a spectral line)
Q | phys.absorption.gal            | Galactic extinction
Q | phys.absorption.opticalDepth   | Optical depth
Q | phys.abund                     | Abundance
Q | phys.abund.Fe                  | Fe/H abundance
Q | phys.abund.X                   | Hydrogen abundance
Q | phys.abund.Y                   | Helium abundance
Q | phys.abund.Z                   | Metallicity abundance
Q | phys.acceleration              | Acceleration
S | phys.aerosol                   | Relative to aerosol
Q | phys.albedo                    | Albedo or reflectance
Q | phys.angArea                   | Angular area
Q | phys.angMomentum               | Angular momentum
E | phys.angSize                   | Angular size width diameter dimension extension major
                                     minor axis extraction radius
E | phys.angSize.smajAxis          | Angular size extent or extension of semi-major axis
E | phys.angSize.sminAxis          | Angular size extent or extension of semi-minor axis
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Q	phys.area	<mark>Area (in surface, not angular units)</mark>
S	phys.atmol	Atomic and molecular physics (shared properties)
Q	phys.atmol.branchingRatio	Branching ratio
Q	phys.atmol.collisional	Related to collisions
Q	phys.atmol.collStrength	Collisional strength
Q	phys.atmol.configuration	Configuration
Q	phys.atmol.crossSection	Atomic / molecular cross-section
Q	phys.atmol.element	Element
Q	phys.atmol.excitation	Atomic molecular excitation parameter
Q	phys.atmol.final	Quantity refers to atomic/molecular final/ground state, level, etc.
Q	phys.atmol.initial	Quantity refers to atomic/molecular initial state, level, ecc.
Q	phys.atmol.ionStage	Ion, ionization stage
S	phys.atmol.ionization	Related to ionization
Q	phys.atmol.lande	Lande factor
S	phys.atmol.level	Atomic level
Q	phys.atmol.lifetime	Lifetime of a level
Q	phys.atmol.lineShift	Line shifting coefficient
Q	phys.atmol.number	Atomic number Z
Q	phys.atmol.oscStrength	Oscillator strength
Q	phys.atmol.parity	Parity
Q	phys.atmol.qn	Quantum number
Q	phys.atmol.radiationType	Type of radiation characterizing atomic lines (electric dipole/quadrupole, magnetic dipole)
Q	phys.atmol.symmetry	Type of nuclear spin symmetry
Q	phys.atmol.sWeight	Statistical weight
Q	phys.atmol.sWeight.nuclear	Statistical weight for nuclear spin states
Q	phys.atmol.term	Atomic term
S	phys.atmol.transition	Transition between states
Q	phys.atmol.transProb	Transition probability, Einstein A coefficient
Q	phys.atmol.wOscStrength	Weighted oscillator strength
Q	phys.atmol.weight	Atomic weight
Q	phys.columnDensity	Column density
S	phys.composition	Quantities related to composition of objects
Q	phys.composition.massLightRatio	Mass to light ratio
Q	phys.composition.yield	Mass yield
S	phys.cosmology	Related to cosmology
Q	phys.damping	Generic damping quantities
Q	phys.density	Density (of mass, electron, ...)
Q	phys.density.phaseSpace	Density in the phase space
Q	phys.dielectric	Complex dielectric function
Q	phys.dispMeasure	Dispersion measure
S	phys.dust	Relative to dust
V	phys.electField	Electric field
S	phys.electron	Electron
Q	phys.electron.degen	Electron degeneracy parameter
Q	phys.emissMeasure	Emission measure
Q	phys.emissivity	Emissivity
Q	phys.energy	Energy
Q	phys.energy.Gibbs	Gibbs (free) energy or free enthalpy [G=H -TS]
Q	phys.energy.Helmholtz	Helmholtz free energy [A=H -TS]
Q	phys.energy.density	Energy density
Q	phys.enthalpy	Enthalpy [H=U+pv]
Q	phys.entropy	Entropy
Q	phys.eos	Equation of state
Q	phys.excitParam	Excitation parameter U
E	phys.fluence	Particle energy received by a surface per unit area and integrated over time
Q	phys.flux	Flux or flow of particle, energy, etc.

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Q | phys.flux.energy              | Energy flux, heat flux
Q | phys.gauntFactor              | Gaunt factor/correction
Q | phys.gravity                  | Gravity
Q | phys.ionizParam               | Ionization parameter
Q | phys.ionizParam.coll          | Collisional ionization
Q | phys.ionizParam.rad           | Radiative ionization
E | phys.luminosity               | Luminosity
Q | phys.luminosity.fun           | Luminosity function
E | phys.magAbs                   | Absolute magnitude
Q | phys.magAbs.bol               | Bolometric absolute magnitude
V | phys.magField                 | Magnetic field
Q | phys.mass                     | Mass
Q | phys.mass.inertiaMomentum     | Momentum of inertia or rotational inertia
Q | phys.mass.loss                | Mass loss
Q | phys.mol                      | Molecular data
Q | phys.mol.dipole               | Molecular dipole
Q | phys.mol.dipole.electric      | Molecular electric dipole moment
Q | phys.mol.dipole.magnetic      | Molecular magnetic dipole moment
Q | phys.mol.dissociation         | Molecular dissociation
Q | phys.mol.formationHeat        | Formation heat for molecules
Q | phys.mol.quadrupole           | Molecular quadrupole
Q | phys.mol.quadrupole.electric  | Molecular electric quadrupole moment
S | phys.mol.rotation             | Molecular rotation
S | phys.mol.vibration            | Molecular vibration
S | phys.particle                 | Related to physical particles
S | phys.particle.neutrino        | Related to neutrino
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
E | phys.polarization             | Polarization degree (or percentage)
Q | phys.polarization.circular    | Circular polarization
Q | phys.polarization.linear      | Linear polarization
Q | phys.polarization.rotMeasure  | Rotation measure polarization
Q | phys.polarization.stokes      | Stokes polarization
Q | phys.polarization.stokes.I    | Stokes polarization coefficient I
Q | phys.polarization.stokes.Q    | Stokes polarization coefficient Q
Q | phys.polarization.stokes.U    | Stokes polarization coefficient U
Q | phys.polarization.stokes.V    | Stokes polarization coefficient V
Q | phys.potential                | Potential ( electric, gravitational, etc)
Q | phys.pressure                 | Pressure
Q | phys.recombination.coeff      | Recombination coefficient
Q | phys.refractIndex             | Refraction index
Q | phys.size                     | Linear size, length (not angular)
Q | phys.size.axisRatio           | Axis ratio (a/b) or (b/a)
Q | phys.size.diameter            | Diameter
Q | phys.size.radius              | Radius
Q | phys.size.smajAxis            | Linear semi major axis
Q | phys.size.sminAxis            | Linear semi minor axis
Q | phys.size.smedAxis            | Linear semi median axis for 3D ellipsoids
Q | phys.temperature              | Temperature
Q | phys.temperature.effective    | Effective temperature
Q | phys.temperature.electron     | Electron temperature
Q | phys.transmission             | Transmission (of filter, instrument, ...)
V | phys.veloc                    | Space velocity
Q | phys.veloc.ang                | Angular velocity
Q | phys.veloc.dispersion         | Velocity dispersion
Q | phys.veloc.escape             | Escape velocity
Q | phys.veloc.expansion          | Expansion velocity
Q | phys.veloc.microTurb          | Microturbulence velocity
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Q | phys.veloc.orbital          | Orbital velocity
Q | phys.veloc.pulsat           | Pulsational velocity
Q | phys.veloc.rotat            | Rotational velocity
Q | phys.veloc.transverse       | Transverse / tangential velocity
Q | phys.virial                 | Related to virial quantities (mass, radius, ..)
Q | phys.volume                 | Volume (in cubic units)
Q | pos                         | Position and coordinates
Q | pos.angDistance             | Angular distance, elongation
Q | pos.angResolution           | Angular resolution
Q | pos.az                      | Position in alt-azimutal frame
Q | pos.az.alt                  | Alt-azimutal altitude
Q | pos.az.azi                  | Alt-azimutal azimut
Q | pos.az.zd                   | Alt-azimutal zenith distance
S | pos.barycenter              | Barycenter
S | pos.bodyrc                  | Body related coordinates
Q | pos.bodyrc.alt              | Body related coordinate (altitude on the body)
Q | pos.bodyrc.lat              | Body related coordinate (latitude on the body)
Q | pos.bodyrc.lon              | Body related coordinate (longitude on the body)
S | pos.cartesian               | Cartesian (rectangular) coordinates
Q | pos.cartesian.x             | Cartesian coordinate along the x-axis
Q | pos.cartesian.y             | Cartesian coordinate along the y-axis
Q | pos.cartesian.z             | Cartesian coordinate along the z-axis
S | pos.centroid                | Centroid position
S | pos.cmb                     | Cosmic Microwave Background reference frame
Q | pos.dirCos                  | Direction cosine
V | pos.distance                | Linear distance
S | pos.earth                   | Coordinates related to Earth
Q | pos.earth.altitude          | Altitude, height on Earth  above sea level
Q | pos.earth.lat               | Latitude on Earth
Q | pos.earth.lon               | Longitude on Earth
S | pos.ecliptic                | Ecliptic coordinates
Q | pos.ecliptic.lat            | Ecliptic latitude
Q | pos.ecliptic.lon            | Ecliptic longitude
S | pos.eop                     | Earth orientation parameters
Q | pos.ephem                   | Ephemeris
Q | pos.eq                      | Equatorial coordinates
Q | pos.eq.dec                  | Declination in equatorial coordinates
Q | pos.eq.ha                   | Hour-angle
Q | pos.eq.ra                   | Right ascension in equatorial coordinates
Q | pos.eq.spd                  | South polar distance in equatorial coordinates
S | pos.errorEllipse            | Positional error ellipse
Q | pos.frame                   | Reference frame used for positions
S | pos.galactic                | Galactic coordinates
Q | pos.galactic.lat            | Latitude in galactic coordinates
Q | pos.galactic.lon            | Longitude in galactic coordinates
S | pos.galactocentric          | Galactocentric coordinate system
S | pos.geocentric              | Geocentric coordinate system
Q | pos.healpix                 | Hierarchical Equal Area IsoLatitude Pixelization
S | pos.heliocentric            | Heliocentric position coordinate (solar system bodies)
Q | pos.HTM                     | Hierarchical Triangular Mesh
S | pos.lambert                 | Lambert projection
S | pos.lg                      | Local Group reference frame
S | pos.lsr                     | Local Standard of Rest reference frame
Q | pos.lunar                   | Lunar coordinates
Q | pos.lunar.occult            | Occultation by lunar limb
Q | pos.nutation                | Nutation (of a body)
Q | pos.outline                 | Set of points outlining a region (contour)
Q | pos.parallax                | Parallax
Q | pos.parallax.dyn            | Dynamical parallax
Q | pos.parallax.phot           | Photometric parallaxes
```

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Q | pos.parallax.spect        | Spectroscopic parallax
Q | pos.parallax.trig         | Trigonometric parallax
Q | pos.phaseAng              | Phase angle, e.g. elongation of earth from sun as seen
                                from a third cel. object
V | pos.pm                    | Proper motion
Q | pos.posAng               | Position angle of a given vector
V | pos.precess              | Precession (in equatorial coordinates)
S | pos.supergalactic        | Supergalactic coordinates
Q | pos.supergalactic.lat    | Latitude in supergalactic coordinates
Q | pos.supergalactic.lon    | Longitude in supergalactic coordinates
P | pos.wcs                  | WCS keywords
P | pos.wcs.cdmatrix         | WCS CDMATRIX
P | pos.wcs.crpix            | WCS CRPIX
P | pos.wcs.crval            | WCS CRVAL
P | pos.wcs.ctype            | WCS CTYPE
P | pos.wcs.naxes            | WCS NAXES
P | pos.wcs.naxis            | WCS NAXIS
P | pos.wcs.scale            | WCS scale or scale of an image
Q | spect                    | Spectroscopy
Q | spect.binSize            | Spectral bin size
S | spect.continuum          | Continuum spectrum
Q | spect.dopplerParam       | Doppler parameter b
E | spect.dopplerVeloc       | Radial velocity, derived from the shift of some spectral
                                feature
E | spect.dopplerVeloc.opt   | Radial velocity derived from a wavelength shift using the
                                optical convention
E | spect.dopplerVeloc.radio | Radial velocity derived from a frequency shift using the
                                radio convention
E | spect.index             | Spectral index
S | spect.line              | Spectral line
E | spect.line.asymmetry    | Line asymmetry
E | spect.line.broad        | Spectral line broadening
Q | spect.line.broad.Stark  | Stark line broadening coefficient
E | spect.line.broad.Zeeman | Zeeman broadening
E | spect.line.eqWidth      | Line equivalent width
E | spect.line.intensity    | Line intensity
E | spect.line.profile      | Line profile
Q | spect.line.strength     | Spectral line strength S
E | spect.line.width        | Spectral line full width half maximum
Q | spect.resolution        | Spectral (or velocity) resolution
S | src                     | Observed source viewed on the sky
S | src.calib               | Calibration source
S | src.calib.guideStar     | Guide star
Q | src.class               | Source classification (star, galaxy, cluster, comet,
                                asteroid )
Q | src.class.color         | Color classification
Q | src.class.distance      | Distance class e.g. Abell
Q | src.class.luminosity    | Luminosity class
Q | src.class.richness      | Richness class e.g. Abell
Q | src.class.starGalaxy    | Star/galaxy discriminator, stellarity index
Q | src.class.struct        | Structure classification e.g. Bautz-Morgan
Q | src.density             | Density of sources
Q | src.ellipticity         | Source ellipticity
Q | src.impactParam         | Impact parameter
Q | src.morph               | Morphology structure
Q | src.morph.param         | Morphological parameter
Q | src.morph.scLength      | Scale length for a galactic component (disc or bulge)
Q | src.morph.type          | Hubble morphological type (galaxies)
S | src.net                 |  Qualifier indicating that a quantity (e.g. flux) is
                                background subtracted rather than total
```

```
Q | src.orbital              | Orbital parameters
Q | src.orbital.eccentricity | Orbit eccentricity
Q | src.orbital.inclination  | Orbit inclination
Q | src.orbital.meanAnomaly  | Orbit mean anomaly
Q | src.orbital.meanMotion   | Mean motion
Q | src.orbital.node         | Ascending node
Q | src.orbital.periastron   | Periastron
Q | src.orbital.Tisserand    | Tisserand parameter (generic)
Q | src.orbital.TissJ        | Tisserand parameter with respect to Jupiter
Q | src.redshift             | Redshift
Q | src.redshift.phot        | Photometric redshift
Q | src.sample               | Sample
Q | src.spType               | Spectral type MK
Q | src.var                  | Variability of source
E | src.var.amplitude        | Amplitude of variation
Q | src.var.index            | Variability index
Q | src.var.pulse            | Pulse
Q | stat                     | Statistical parameters
Q | stat.asymmetry           | Measure of asymmetry
P | stat.correlation         | Correlation between two parameters
P | stat.covariance          | Covariance between two parameters
P | stat.error               | Statistical error
P | stat.error.sys           | Systematic error
Q | stat.filling             | Filling factor (volume, time, ..)
Q | stat.fit                 | Fit
P | stat.fit.chi2            | Chi2
P | stat.fit.dof             | Degrees of freedom
P | stat.fit.goodness        | Goodness or significance of fit
S | stat.fit.omc             | Observed minus computed
Q | stat.fit.param           | Parameter of fit
P | stat.fit.residual        | Residual fit
Q | stat.Fourier             | Fourier coefficient
Q | stat.Fourier.amplitude   | Amplitude of Fourier coefficient
S | stat.fwhm                | Full width at half maximum
S | stat.interval            | Generic interval between two limits (defined as a pair of
                                values)
P | stat.likelihood          | Likelihood
S | stat.max                 | Maximum or upper limit
S | stat.mean                | Mean, average value
S | stat.median              | Median value
S | stat.min                 | Minimum or lowest limit
Q | stat.param               | Parameter
Q | stat.probability         | Probability
P | stat.rank                | Rank or order in list of sorted values
P | stat.rms                 | Root mean square  Square root of sum of squared values
                                or quadratic mean
P | stat.snr                 | Signal to noise ratio
P | stat.stdev               | Standard deviation as the square root of the variance
S | stat.uncalib             | Qualifier of a generic uncalibrated quantity
Q | stat.value               | Miscellaneous value
P | stat.variance            | Variance
P | stat.weight              | Statistical weight
Q | time                     | Time, generic quantity in units of time or date
Q | time.age                 | Age
Q | time.creation            | Creation time/date (of dataset, file, catalogue,...)
Q | time.crossing            | Crossing time
Q | time.duration            | Interval of time describing the duration of a generic event
                                or phenomenon
Q | time.end                 | End time/date of a generic event
Q | time.epoch               | Instant of time related to a generic event (epoch, date,
```

Julian date, time stamp/tag,...)

Q	time.equinox	Equinox
Q	time.interval	Time interval, time-bin, time elapsed between two events, not the duration of an event
Q	time.lifetime	Lifetime
Q	time.period	Period, interval of time between the recurrence of phases in a periodic phenomenon
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)
Q	time.phase	Phase, position within a period
Q	time.processing	A time/date associated with the processing of data
Q	time.publiYear	Publication year
Q	time.relax	Relaxation time
Q	time.release	The time/date data is available to the public
Q	time.resolution	Time resolution
Q	time.scale	Timescale
Q	time.start	Start time/date of generic event

Appendix B: Changes from previous versions

Changes from v1.23-20160719
Additions:

	New UCD word	Description
S	arith.squared	Squared quantity
S	arith.sum	Summed or integrated quantity
S	arith.variation	Generic variation of a quantity
S	instr.voxel	Related to a voxel (n-D volume element with n>2)
Q	pos.outline	Set of points outlining a region (contour)
Q	stat.asymmetry	Measure of asymmetry
Q	phys.polarization.stokes.I	Stokes polarization coefficient I
Q	phys.polarization.stokes.Q	Stokes polarization coefficient Q
Q	phys.polarization.stokes.U	Stokes polarization coefficient U
Q	phys.polarization.stokes.V	Stokes polarization coefficient V
Q	stat.asymmetry	Measure of asymmetry
S	stat.fwhm	Full width at half maximum
S	stat.interval	Generic interval between two limits (defined as a pair of values)
P	stat.rank	Rank or order in list of sorted value
P	stat.rms	Root mean square Square root of sum of squared values or quadratic mean

Amendments/clarifications:

Definition for
phys.area: Area (in surface, not angular units)
stat.stdev: Standard deviation as the square root of the variance

Changes from v1.23-20150608

Text of Abstract, last two lines. Added reference to Technical Note by Ceconni et al.
Section 1.1 Definition: "Abbreviations are used in contexts where their meaning is unambiguous"
instead of "kept to a minimum…"

Amendments/clarifications:

Description changed in words:
em.UV.10-50nm, em.UV.100-200nm, em.UV.200-300nm,
meta.id.PI, phot.flux, phot.fluence, src.class

Additions:

	New UCD word	Description
Q	em.freq.cutoff	Cutoff frequency
Q	em.freq.resonance	Resonance frequency
S	em.pw	Plasma waves (trapped in local medium)
S	em.radio.20MHz	Radio below 20 MHz
Q	instr.experiment	Experiment or group of instruments
Q	meta.calibLevel	Processing/calibration level
S	meta.preview	Related to a preview operation (for a dataset)
Q	meta.query	Related to query posed to an information system or database
S	obs.calib.dark	Related to dark current calibration
S	obs.occult	Observation of occultation phenomenon by solar sy
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
E	phys.fluence	Radiant photon energy received by a surface per unit area, or irradiance of a surface integrated over time of irradiation
Q	phys.flux	Flux or flow of particle, energy, etc.
Q	phys.flux.energy	Energy flux, heat flux
Q	phys.mass.inertiaMomentum	Momentum of inertia or rotational inertia
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	pos.outline	Set of points outlining a region (contour)
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 year)
Q	time.period.rotation	Period of rotation of a body around its axis (similar

Deletions/replacements:

deleted: em.UV.FUV
deleted: phys.mol.qn   replaced by: phys.atmol.qn
deleted: pos.bodyrc.long   replaced by: pos.bodyrc.lon
deleted: pos.eop.nutation   replaced by: pos.nutation

Changes from v1.22

Text of par. 1.1 (2), last three lines;
List of em bands reordered according to wl/freq.

Amendments/clarifications:

Description changed in words:
phys.atmol.qn

Additions:

em.line.Hdelta, em.line.Lyalpha, em.line.CO

Deletions/replacements:

deleted: phys.mol.qn   replaced by: phys.atmol.qn

Changes from v1.21

Amendments/clarifications:

Syntax flag changed in words:
phys.polarization

Description changed in words:
em.IR.FIR, em.IR.MIR, em.IR.NIR, em.line.OIII

Changes from v1.2

Additions:

spect.continuum

Changes from v1.11 (Rec20051231)

Amendments/clarifications:

Spelling: phys.atmol.sWeight

Syntax flag changed in words:
phys.atmol, spect.line

Description changed in words:

meta.dataset, obs.atmos, phot.color.reddFree, phys.size, phys.size.diameter, phys.size.radius, stat.param, stat.value, time, time.epoch, time.interval, time.period, time.phase

Additions:

em.bin, em.binSize, em.IR.FIR, em.IR.MIR, em.IR.NIR, em.UV.FUV, meta.abstract, meta.code.status, meta.email, meta.id.PI, meta.id.CoI, meta.ref.ivorn, meta.ref.uri, obs.calib.flat, obs.exposure, obs.proposal, obs.proposal.cycle, obs.sequence, phys.atmol.symmetry, phys.atmol.sWeight.nuclear, phys.cosmology, phys.damping, phys.entropy, phys.particle.neutrino, phys.virial, spect.line.strength, src.calib, src.calib.guideStar, src.net, stat.filling, stat.probability, stat.uncalib, time.creation, time.duration, time.end, time.processing, time.publiYear, time.release, time.start

Deletions/replacements:

deleted	replacement	description
phys.atmol.damping	phys.damping	Atomic damping quantities (van der Waals)
phys.atmol.qn.I	phys.atmol.qn	Nuclear spin quantum number
time.event	time.duration	Duration of an event or phenomenon
time.event.end	time.end	End time of event or phenomenon
time.event.start	time.start	Start time of event or phenomenon
time.expo	time.duration;obs.exposure	Exposure on-time, duration
time.expo.end	time.end;obs.exposure	End time of exposure
time.expo.start	time.start;obs.exposure	Start time of exposure
time.obs	time.duration;obs	Observation on-time, duration
time.obs.end	time.end;obs	End time of observation
time.obs.start	time.start;obs	Start time of observation

Changes from v1.10

1. A few minor changes to the text have been done
2. All UCD words are now compliant with the UCD recommendation. The corresponding changes are described below
3. The following words have been deprecated:

Deprecated UCD	New corresponding UCD
phot.fluxDens	phot.flux.density
phot.fluxDens.sb	phot.flux.density.sb
phys.at*	**phys.atmol***
phys.atmol.coll	phys.atmol.collisional
phys.atmol.ion	phys.atmol.ionStage
phys.atmol.trans	phys.atmol.transition
phys.energyDensity	phys.energy.density
phys.massToLight	phys.composition.massLightRatio
phys.massYield	phys.composition.yield
spect.doppler	spect.dopplerParam

4. The following word has been created: phys.composition
5. The section *Changes from previous versions* has been reformatted

Changes from v1.02

1. Descriptions have been changed for the following words: em.line, instr.pixel, phys.gravity, pos.earth.altitude
2. The syntax flags changed for words: instr.filter, phys.angSize
3. The following words have been deprecated:

Deprecated UCD	New corresponding UCD
instr.filter.transm	phys.transm;instr.filter
phys.mass.light	phys.massToLight
pos.resolution	pos.angResolution
pos.satellite	pos.bodyrc

4. The following words have been created: phys.polarization.circular, phys.polarization.linear, phys.size.axisRatio, pos.bodyrc.alt, pos.bodyrc.lat, pos.bodyrc.long, time.event, time.event.end, time.event.start

Changes from v1.01

1. The following words have been restored to their previous spelling (v1.00): phot.fluDensity, phys.energDensity, phys.mYield, phot.fluxDensity, phys.energyDensity, phys.massYield

   A note has been added to indicate that these words do not strictly comply with the UCD1+ Rec.

Changes from v1.00

1. Descriptions have been changed for the following words: em.IR.H, em.IR.J, em.IR.K, em.X-ray.hard, em.X-ray.medium, em.X-ray.soft, em.gamma.hard, em.gamma.soft, em.opt.B, em.opt.I, em.opt.R, em.opt.U, em.opt.V, instr.bandpass, phot.count, phys.density, phys.mol.dipole.electric, phys.mol.dipole.magnetic, phys.mol.quadrupole.electric, pos.angDistance, pos.precess, src, src.class.distance, src.class.richness, src.class.starGalaxy, src.class.struct, time.expo, time.expo.end, time.expo.start, time.interval
2. The following words have been deprecated:

Deprecated UCD	New corresponding UCD
instr.angRes	pos.resolution
instr.obsty.site	pos.earth.altitude;instr.obsty
instr.obsty.site.seeing	instr.obsty.seeing
instr.spect	instr
instr.spect.dispersion	instr.dispersion
instr.spect.order	instr.order
instr.spect.resolution	spect.resolution
instr.tel.focus	instr.tel.focalLength
meta.fits.software	meta.software
obs.air	obs.atmos
obs.air.extinction	obs.atmos.extinction
obs.air.mass	obs.airMass

phot.fluxDens	phot.fluDens
phot.fluxDens.sb	phot.fluDens.sb
phot.sb	phot.mag.sb
phys.at.branchingRatio	phys.atmol.branchingRatio
phys.at.crossSection	phys.atmol.crossSection
phys.at.lineShift	phys.atmol.lineShift
phys.at.moment	
phys.at.moment.electric	phys.at.radiationType
phys.at.moment.magnetic	phys.at.radiationType
phys.at.qn.S	phys.at.qn
phys.at.qn.L	phys.at.qn
phys.at.qn.J	phys.at.qn
phys.at.qn.F	phys.at.qn
phys.atmol.state.final	phys.atmol.final
phys.atmol.state.initial	phys.atmol.initial
phys.massYield	phys.mYield
phys.mol.quadrupole.magnetic	phys.at.radiationType
phys.refraction	phys.refractIndex
pos.az.ha	pos.eq.ha
pos.earth.nutation	pos.eop.nutation
spect.veloc	spect.dopplerVeloc
src.fwhm	phys.angSize;src
src.orbital.veloc	phys.veloc.orbital
src.veloc	phys.veloc
src.veloc.ang	phys.veloc.ang
src.veloc.cmb	phys.veloc;pos.cmb
src.veloc.dispersion	phys.veloc.dispersion
src.veloc.escape	phys.veloc.escape
src.veloc.expansion	phys.veloc.expansion
src.veloc.lg	phys.veloc;pos.lg
src.veloc.lsr	phys.veloc;pos.lsr
src.veloc.microTurb	phys.veloc.microTurb
src.veloc.pulsat	phys.veloc.pulsat
src.veloc.rotat	phys.veloc.rotat

3. The syntax flags changed for words: instr.fov, instr.obsty, meta.file, phys.angSize, pos.cartesian, stat.fit.omc
4. The following words have been created: instr.dispersion, instr.order, instr.tel.focalLength, meta.curation, meta.software, meta.version, obs.atmos, obs.atmos.extinction, obs.airMass, obs.atmos.refractAngle, obs.calib, phys.at.radiationType, phys.atmol.branchingRatio, phys.atmol.crossSection, phys.atmol.lifetime, phys.atmol.lineShift, phys.energDensity, phys.refractIndex, phys.transmission, pos.eq.ha, pos.az.azi, pos.bodyrc, pos.cmb, pos.earth.altitude, pos.eop, pos.eop.nutation, pos.lg, pos.lsr, pos.phaseAng, pos.resolution, spect.resolution, spect.dopplerVeloc, spect.dopplerVeloc.radio, spect.dopplerVeloc.opt, src.orbital.meanMotion, phys.veloc, phys.veloc.ang, phys.veloc.dispersion, phys.veloc.escape, phys.veloc.expansion, phys.veloc.microTurb, phys.veloc.orbital, phys.veloc.pulsat, phys.veloc.rotat, phys.veloc.transverse, time.obs, time.obs.end, time.obs.start

Changes from v0.2

1. Section 1.2 has been simplified
2. 3 new syntax codes (E, C, V) have been introduced, and described in appendix A
3. The following words have been renamed :

Deprecated UCD	New corresponding UCD
em.line.21cm	em.line.HI
instr.ang-res	instr.angRes
instr.sky-level	instr.skyLevel
instr.sky-temp	instr.skyTemp
instr.antenna-temp	phot.antennaTemp
phys.absorption.gf	phys.gauntFactor
phys.at.einstein	phys.at.transProb
phys.at.level	phys.atmol.level
phys.dispMeas	phys.dispMeasure
phys.distance	pos.distance
phys.polarization.rotMeas	phys.polarization.rotMeasure
phys.size.area	phys.area
pos.ang.separation	pos.angDistance
pos.ec	pos.ecliptic
pos.ec.lat	pos.ecliptic.lat
pos.ec.lon	pos.ecliptic.lon
pos.ee	pos.errorEllipse
pos.gal	pos.galactic
pos.gal.lat	pos.galactic.lat
pos.gal.lon	pos.galactic.lon
pos.sg	pos.supergalactic
pos.sg.lat	pos.supergalactic.lat
pos.sg.lon	pos.supergalactic.lon
src.class.star-galaxy	src.class.starGalaxy

4. The following words have been created: instr.beam, meta.code.error, meta.id.part, phot.flux.sb, phys.angArea, phys.angSize, phys.angSize.smajAxis, phys.angSize.sminAxis, phys.area, phys.at.damping, phys.at.weight, phys.atmol.excitation, phys.mol.dissociation, phys.recombination.coeff, phys.size.smajAxis, phys.size.sminAxis, pos.cartesian, pos.cartesian.x, pos.cartesian.y, pos.cartesian.z, pos.distance, pos.eq.spd, pos.galactocentric, pos.geocentric, pos.healpix, pos.heliocentric, pos.HTM, pos.lambert, pos.satellite, spect.line.broad.Stark, spect.veloc, src.redshift.phot, stat.correlation, time.lifetime

5. Some words have been removed. The following table summarizes, when relevant, the suggested replacement to be used.

Deprecated UCD	New corresponding UCD
instr.area	phys.area;instr
instr.beam-width	phys.angSize;instr.beam
meta.table.axis	phys.size;meta.table
phot.color.Cous	phot.color
phot.color.Gen	phot.color
phot.color.Gunn	phot.color

phot.color.JHN	phot.color
phot.color.STR	phot.color
phot.color.STR.c1	phot.color
phot.color.STR.b-y	phot.color
phot.color.STR.m1	phot.color
phys.at.lineBroad	spect.line.broad
phys.distance.compon	pos.distance;pos.cartesian.x (or y, z)
phys.distance.gc	pos.distance;pos.galactocentric
phys.electron.energy	phys.energy;phys.electron
phys.extension	phys.angSize or phys.size
phys.mass.fraction	phys.mass;arith.ratio
phys.polarization.posAng	pos.posAng;phys.polarization
pos.ang	
pos.det	pos.cartesian;instr.det
pos.eq.dec.arcsec	
pos.eq.ra.minutes	
pos.eq.ra.seconds	
pos.gal.compon	pos.cartesian;pos.galactic
pos.pm.dec	pos.pm;pos.eq.dec
pos.pm.ra	pos.pm;pos.eq.ra
pos.precess.dec	pos.precess;pos.eq.dec
pos.precess.ra	pos.precess;pos.eq.ra
pos.proj	
pos.sg.compon	pos.cartesian;pos.supergalactic
src.orbital.energy	phys.energy;src.orbital
src.orbital.separation	pos.angDistance;src.orbital
src.orbital.size	phys.size;src.orbital
src.separation	pos.angDistance;src
src.veloc.compon	src.veloc;pos.cartesian
src.veloc.gc	src.veloc;pos.galactocentric
src.veloc.geoc	src.veloc;pos.geocentric
src.veloc.hc	src.veloc;pos.heliocentric

Changes from v0.1

1. Descriptions of the words were improved.
2. Designation of commonly used lines have been moved to em.line.*. As a consequence, terms like em.IR.K.Brgamma or spect.index.Hbeta have been removed.
3. phys.at and phys.mol have been completely reorganized to improve the overall description of this domain. A new branch phys.atmol has been introduced to group concepts shared between phys.at and phys.mol.
4. The phot.color section was significantly simplified.
5. Missing nodes of the tree were added (e.g. em.gamma, em.mm, pos.sg).
6. Creation of new words: em.wavenumber, meta.ucd, stat.error.sys
7. Typos were corrected in em.opt.* units and a few other descriptions.

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