International
Virtual
Observatory
Alliance

The UCD1+ controlled vocabulary
Version 1.02

IVOA Proposed Recommendation 2005-07-12

This version:
http://www.ivoa.net/Documents/PR/UCD/UCDlist-20050712.pdf

Latest version:
http://www.ivoa.net/Documents/latest/UCDlist.html

Previous versions:
http://www.ivoa.net/Documents/WD/UCD/UCDlist-20050503.pdf

Editor(s):
S. Derriere, A. Preite Martinez

Authors:
Andrea Preite Martinez (andrea@rm.iasf.cnr.it)
Sébastien Derriere (derriere@astro.u-strasbg.fr)
Norman Gray (norman@astro.gla.ac.uk)
Robert Mann (rgm@roe.ac.uk)
Jonathan McDowell (jcm@cfa.harvard.edu)
Thomas Mc Glynn (Thomas.A.McGlynn@nasa.gov)
François Ochsenbein (francois@astro.u-strasbg.fr)
Pedro Osuna (Pedro.Osuna@esa.int)
Guy Rixon (gtr@ast.cam.ac.uk)
Roy Williams (roy@cacr.caltech.edu)

Abstract

This document describes the list of controlled terms used to build the Unified Content Descriptors, Version 1+ (UCD1+).

The document describing the current proposal for a new set of UCD called UCD1+ can be found at the url: http://www.ivoa.net/Documents/latest/UCD.html. Here we briefly recall the structure of the proposed UCD1+ and the origin of the present lists.

Status of this document

This is an IVOA Proposed Recommendation made available for public review. It is appropriate to reference this document only as a recommended standard that is under review and which may be changed before it is accepted as a full recommendation.

Comments on this document can be posted on the dedicated RFC page at http://www.ivoa.net/twiki/bin/view/IVOA/UCDListRFC General discussion on UCD can be sent to ucdivoa.net, a mailing list with a public archive.

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

Acknowledgments

This document is based on the W3C documentation standards, but has been adapted for the IVOA.

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(.). So the hierarchy is the following:

atoms $\longrightarrow$ words $\longrightarrow$ composed words

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

UCDs should be "controlled" (through a process that is also indicated in the reference document above). Control should be exercised at the level of words (ucd1+) but also at the level of the vocabulary (atoms) used to form words. A consistent list of atoms should be mantained, making sure that the same atom means always the same thing, even if used in combination with different other atoms.

1.1 Definition of atoms

Atoms were defined following these guidelines:

1. abbreviations are kept to a minimum, and only if the result is not ambiguous (**ra**, **dec** are OK, but **t** is ambiguous: we use **time** and **temperature** 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**)

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 (http://www.ivoa.net/Documents/latest/UCD.html).

A few words in the present list do not strictly comply with one of the recommendations (*for any two words at the same level in the hierarchy, one can't be a starting substring of the other*), mostly for readibility reasons.

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)
   We include in this section 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)
   In this section we gather all the quantities related to astronomical instrumentation, e.g. detectors (plates, CCDs, etc.), spectrographs, telescopes (but also observatories or missions), etc.
4. **meta** (metadata)
   This section includes all the information that is not coming directly from a measure, and info 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. Basically we 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). We also include "colors", which are differences of magnitudes (i.e. ratios of fluxes) measured in different e.m. bands. In the present proposal we tried to simplify the PHOT section of old UCD1, keeping only the most important (used, diffuse) colors.
7. **phys** (physics)
   Atomic and molecular data (mainly used for spectroscopy) and basic physical quantities (temperature, mass, gravity, luminosity, etc.)
8. **pos** (positional data)
   All quantities related to the position of an object, in general on the sky. Angular quantities, with the exception of projections from spherical to rectangular systems. Also 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 are placed here for the moment.
9. **spect** (spectral data)

For historical reasons, photometric data taken in narrow spectral bands with instruments called spectrographs are classified as spectroscopic data. Don't miss up with "**em**". Bi-dimensionally speaking, **em** represents the x axis, **phot** and **spect** the y axis.

10. **src** (source)
    This is a rather generic section, mainly devoted to source classifications. For no other than practical reasons, variability, orbital and velocity data are also included in this section.
11. **stat** (statistics)
    Statistical information on measurements.
12. **time** (time)
    Quantities related to time (age, date, period, etc.)

A List of valid words

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

- The code "P" means that the word can only be used as "primary" or first word;
- "S" stands for only secondary: it can't be used as the first word to describe a single quantity;
- "Q" means that the word can be used indifferently as first or secondary word;
- "E" means a photometric quantity, and can be followed by a word describing a part of the electromagnetic spectrum
- "C" is a colour index, and can be followed by two successive word describing a part of the electromagnetic spectrum;
- "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
Q | arith.zp                 |  Zero point
S | em                       |  Electromagnetic spectrum
S | em.IR                    |  Infrared part of the spectrum
S | em.IR.15-30um            |  Infrared between 15 and 30 micron
S | em.IR.3-4um              |  Infrared between 3 and 4 micron
S | em.IR.30-60um            |  Infrared between 30 and 60 micron
S | em.IR.4-8um              |  Infrared between 4 and 8 micron
S | em.IR.60-100um           |  Infrared between 60 and 100 micron
S | em.IR.8-15um             |  Infrared between 8 and 15 micron
S | em.IR.H                  |  Infrared between 1.5 and 2 micron
S | em.IR.J                  |  Infrared between 1.0 and 1.5 micron
S | em.IR.K                  |  Infrared between 2 and 3 micron
S | em.UV                    |  Ultraviolet part of the spectrum
S | em.UV.10-50nm            |  Ultraviolet between 10 and 50 nm
S | em.UV.100-200nm          |  Ultraviolet between 100 and 200 nm
S | em.UV.200-300nm          |  Ultraviolet between 200 and 300 nm
S | em.UV.50-100nm           |  Ultraviolet between 50 and 100 nm
S | em.X-ray                 |  X-ray part of the spectrum
S | em.X-ray.hard            |  Hard X-ray (12 - 120 keV)
S | em.X-ray.medium          |  Medium X-ray (2 - 12 keV)
S | em.X-ray.soft            |  Soft X-ray (0.2 - 2 keV)
Q | em.energy                |  Energy value in the em frame
Q | em.freq                  |  Frequency value in the em frame
```

S	em.gamma	Gamma rays part of the spectrum
S	em.gamma.hard	Hard gamma ray (>500 keV)
S	em.gamma.soft	Soft gamma ray (120 - 500 keV)
S	em.line	Designation of major atomic and molecular lines
S	em.line.HI	21cm hydrogen line
S	em.line.Brgamma	Bracket gamma 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.OIII	[OIII] line
S	em.mm	Millimetric part of the spectrum
S	em.mm.100-200GHz	Millimetric between 100 and 200 GHz
S	em.mm.1500-3000GHz	Millimetric between 1500 and 3000 GHz
S	em.mm.200-400GHz	Millimetric between 200 and 400 GHz
S	em.mm.30-50GHz	Millimetric between 30 and 50 GHz
S	em.mm.400-750GHz	Millimetric between 400 and 750 GHz
S	em.mm.50-100GHz	Millimetric between 50 and 100 GHz
S	em.mm.750-1500GHz	Millimetric between 750 and 1500 GHz
S	em.opt	Optical part of the spectrum
S	em.opt.B	Optical band between 400 and 500 nm
S	em.opt.I	Optical band between 750 and 1000 nm
S	em.opt.R	Optical band between 600 and 750 nm
S	em.opt.U	Optical band between 300 and 400 nm
S	em.opt.V	Optical band between 500 and 600 nm
S	em.radio	Radio part of the spectrum
S	em.radio.100-200MHz	Radio between 100 and 200 MHz
S	em.radio.12-30GHz	Radio between 12 and 30 GHz
S	em.radio.1500-3000MHz	Radio between 1500 and 3000 MHz
S	em.radio.20-100MHz	Radio between 20 and 100 MHz
S	em.radio.200-400MHz	Radio between 200 and 400 MHz
S	em.radio.3-6GHz	Radio between 3 and 6 GHz
S	em.radio.400-750MHz	Radio between 400 and 750 MHz
S	em.radio.6-12GHz	Radio between 6 and 12 GHz
S	em.radio.750-1500MHz	Radio between 750 and 1500 MHz
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.filter	Filter
Q	instr.filter.transm	Filter transmission
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
S	instr.plate	Photographic plate
Q	instr.plate.emulsion	Plate emulsion
Q	instr.precision	Instrument precision
Q	instr.saturation	Instrument saturation threshold
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
P	meta	Metadata
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
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.cryptic	Unknown or impossible to understand quantity
P	meta.curation	Identity of man/organization responsible for the data
Q	meta.dataset	Dataset
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.cross	Cross identification
P	meta.id.parent	Identification of parent source
P	meta.id.part	Part of identifier, suffix or sub-component
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)
P	meta.record	Record number
P	meta.ref	Reference, or origin
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
Q	obs.atmos.extinction	Atmospheric extinction
Q	obs.atmos.refractAngle	Atmospheric refraction angle
S	obs.calib	Calibration observation
S	obs.field	Region covered by the observation
S	obs.image	Image
Q	obs.observer	Observer, discoverer
Q	obs.param	Various observation or reduction parameter
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	fluence
E	phot.flux	Photon flux
Q	phot.flux.bol	Bolometric flux
E	phot.flux.sb	Flux surface brightness
E	phot.fluxDens	Flux density (per wl/freq/energy interval)
E	phot.fluxDens.sb	Flux density surface brightness
E	phot.limbDark	Limb-darkening coefficients
E	phot.mag	Photometric magnitude
Q	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
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
Q | phys.albedo                  |  Albedo or reflectance
Q | phys.angArea                 |  Angular area
Q | phys.angMomentum             |  Angular momentum
V | phys.angSize                 |  Angular size width diameter dimension extension major minor axis extraction radius
Q | phys.angSize.smajAxis        |  angular size extent or extension of semi-major axis
Q | phys.angSize.sminAxis        |  angular size extent or extension of semi-minor axis
Q | phys.area                    |  Area (in linear units)
Q | phys.at                      |  Atomic physics
Q | phys.at.collStrength         |  Collisional strength
Q | phys.at.damping              |  Atomic damping quantities (van der Waals)
Q | phys.at.lande                |  Lande factor
Q | phys.at.number               |  Atomic number Z
Q | phys.at.oscStrength          |  Oscillator strength
Q | phys.at.qn                   |  Atomic quantum number
Q | phys.at.qn.I                 |  Nuclear spin quantum number
Q | phys.at.radiationType        |  Type of radiation characterizing atomic lines (electric dipole/quadrupole, magnetic dipo
Q | phys.at.term                 |  Atomic term
Q | phys.at.transProb            |  Atomic transition probability, Einstein A coefficient
Q | phys.at.wOscStrength         |  Weighted oscillator strength
Q | phys.at.weight               |  Atomic weight
Q | phys.atmol                   |  Atomic and molecular physics (shared properties)
Q | phys.atmol.branchingRatio    |  Branching ratio
Q | phys.atmol.coll              |  Related to collisions
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, ecc.
Q | phys.atmol.initial           |  Quantity refers to atomic/molecular initial state, level, ecc.
Q | phys.atmol.ion               |  Ion
S | phys.atmol.ionization        |  Related to ionization
S | phys.atmol.level             |  Atomic level
Q | phys.atmol.lifetime          |  Lifetime of a level
Q | phys.atmol.lineShift         |  Line shifting coefficient
Q | phys.atmol.parity            |  Parity
Q | phys.atmol.sweight           |  Statistical weight
S | phys.atmol.trans             |  Transition between states
Q | phys.columnDensity           |  Column density
Q | phys.density                 |  Density (of mass, electron, ...)
Q | phys.dielectric              |  Complex dielectric function
Q | phys.dispMeasure             |  Dispersion measure
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.energyDensity           |  Energy-density
Q | phys.eos                     |  Equation of state
Q | phys.excitParam              |  Excitation parameter U
Q | phys.gauntFactor             |  Gaunt factor/correction
```

```
Q | phys.gravity                 |  Surface 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.light              |  Mass to light ratio
Q | phys.mass.loss               |  Mass loss
Q | phys.massYield               |  Mass yield
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.qn                  |  Molecular quantum numbers
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
Q | phys.polarization            |  Polarization
Q | phys.polarization.rotMeasure |  Rotation measure polarization
Q | phys.polarization.stokes     |  Stokes polarization
Q | phys.pressure                |  Pressure
Q | phys.recombination.coeff     |  Recombination coefficient
Q | phys.refractIndex            |  Refraction index
Q | phys.size                    |  Size (not angular)
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.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
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 | pos                          |  Position and coordinates
Q | pos.angDistance              |  Angular distance, elongation
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
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.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 above the Earth's surface
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.eop.nutation            |  Earth nutation
S | pos.errorEllipse            |  Positional error ellipse
Q | pos.ephem                   |  Ephemeris
S | 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
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.parallax                |  Parallax
Q | pos.parallax.dyn            |  Dynamical parallax
Q | pos.parallax.phot           |  Photometric parallaxes
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)
Q | pos.resolution              |  Angular resolution
Q | pos.satellite               |  Position/coordinates of satellite or planet
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.doppler               |  Doppler parameter b
E | spect.index                 |  Spectral index
E | 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
E | spect.line.width            |  Spectral line fwhm
Q | spect.resolution            |  Spectral (or velocity) resolution
E | spect.dopplerVeloc          |  Radial velocity, derived from the shift of some spectral feature
E | spect.dopplerVeloc.radio    |  Radial velocity derived from a frequency shift using the radio convention
E | spect.dopplerVeloc.opt      |  Radial velocity derived from a wavelength shift using the optical convention
S | src                         |  Observed source viewed on the sky
Q | src.class                   |  Source classification (star, galaxy, cluster...)
```

```
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)
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.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.Fourier                 |  Fourier coefficient
Q | stat.Fourier.amplitude       |  Amplitude Fourier coefficient
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.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
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
P | stat.snr                     |  Signal to noise ratio
P | stat.stdev                   |  Standard deviation
Q | stat.value                   |  Miscellaneous value
P | stat.variance                |  Variance
P | stat.weight                  |  Statistical weight
Q | time                         |  Time
Q | time.age                     |  Age
Q | time.crossing                |  Crossing time
Q | time.epoch                   |  Epoch, julian date
Q | time.equinox                 |  Equinox
Q | time.expo                    |  Exposure on-time, duration
Q | time.expo.end                |  End time of exposure
Q | time.expo.start              |  Start time of exposure
Q | time.interval                |  Interval of time
Q | time.lifetime                |  Lifetime
Q | time.obs                     |  Observation on-time, duration
Q | time.obs.end                 |  End time of observation
Q | time.obs.start               |  Start time of observation
Q | time.period                  |  Period
```

```
Q | time.phase                  |  Phase
Q | time.relax                  |  Relaxation time
Q | time.resolution             |  Time resolution
Q | time.scale                  |  Timescale
```

B Changes from previous versions

Changes from v0.1

- Descriptions of the words were improved.
- 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.
- **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**.
- The **phot.color** section was significantly simplified.
- Missing nodes of the tree were added (e.g. **em.gamma**, **em.mm**, **pos.sg**).
- Creation of new words: **em.wavenumber**, **meta.ucd**, **stat.error.sys**
- Typos were corrected in **em.opt.*** units and a few other descriptions.

Changes from v0.2

- Section 1.2 has been simplified
- 3 new syntax codes (E, C, V) have been introduced, and described in appendix A
- 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

- The following words have been created:

```
instr.beam                  pos.cartesian.x
meta.code.error             pos.cartesian.y
meta.id.part                pos.cartesian.z
phot.flux.sb                pos.distance
phys.angArea                pos.eq.spd
```

phys.angSize	pos.galactocentric
phys.angSize.smajAxis	pos.geocentric
phys.angSize.sminAxis	pos.healpix
phys.area	pos.heliocentric
phys.at.damping	pos.htm
phys.at.weight	pos.lambert
phys.atmol.excitation	pos.satellite
phys.mol.dissociation	spect.line.broad.Stark
phys.recombination.coeff	spect.veloc
phys.size.smajAxis	src.redshift.phot
phys.size.sminAxis	stat.correlation
pos.cartesian	time.lifetime

- 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 v1.00

- Descriptions have been changed for the following words:

em.IR.H	phys.density
em.IR.J	phys.mol.dipole.electric
em.IR.K	phys.mol.dipole.magnetic
em.X-ray.hard	phys.mol.quadrupole.electric
em.X-ray.medium	pos.angDistance
em.X-ray.soft	pos.precess

em.gamma.hard	src
em.gamma.soft	src.class.distance
em.opt.B	src.class.richness
em.opt.I	src.class.starGalaxy
em.opt.R	src.class.struct
em.opt.U	time.expo
em.opt.V	time.expo.end
instr.bandpass	time.expo.start
phot.count	time.interval

- 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

- The syntax flags changed for words:

instr.fov
instr.obsty
meta.file
phys.angSize
pos.cartesian
stat.fit.omc

- 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 v1.01

- The following words have been restored to their previous spelling (v1.00):

phot.fluDensity	phot.fluxDensity
phys.energDensity	phys.energyDensity
phys.mYield	phys.massYield

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