International

Virtual

Observatory

Alliance

The UCD1+ controlled vocabulary Version 1.21

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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.

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.
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 that is also indicated in the reference document above). 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 mantained, 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 kept to a minimum, and only if the result is not ambiguous. (**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**).

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), and described in detail in http://www.ivoa.net/Documents/latest/UCDlistMaintenance.html .

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:

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

Code	Word	Description
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.FIR	Far-Infrared
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.IR.MIR	Medium-Infrared
S	em.IR.NIR	Near-Infrared
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.UV.FUV	Far-Ultraviolet
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 (0.12 - 2 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
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 lines
S	em.line.Brgamma	Bracket gamma line
S	em.line.HI	21cm hydrogen line
S	em.line.Halpha	H-alpha line

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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
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.saturation          | Instrument saturation threshold
Q | instr.scale               | Instrument scale (for CCD, plate, image)
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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.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
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, archive
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
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
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, service endpoint
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
                                 observation
Q | obs.atmos.extinction       | Atmospheric extinction
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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.exposure                  | Exposure
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
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, reddening-free 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.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
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
Q | 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)
S | phys.atmol                    | Atomic and molecular physics
Q | phys.atmol.branchingRatio     | Branching ratio
Q | phys.atmol.collStrength       | Collisional strength
Q | phys.atmol.collisional        | Related to collisions
Q | phys.atmol.configuration      | Configuration
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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.ionStage	Ion
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	Atomic 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
Q	phys.atmol.transProb	Atomic transition probability, Einstein A coefficient
S	phys.atmol.transition	Transition between states
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.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.energy.density	Energy-density
Q	phys.entropy	Entropy
Q	phys.eos	Equation of state
Q	phys.excitParam	Excitation parameter U
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

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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.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
S | phys.particle.neutrino            | Related to neutrino
Q | 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.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                | Linear diameter
Q | phys.size.radius                  | Linear 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 | phys.virial                       | Related to virial quantities (mass, radius, ..)
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.long                   | Body related coordinate (longitude on the body)
S | pos.cartesian                     | Cartesian (rectangular) coordinates
Q | pos.cartesian.x                   | Cartesian coordinate along the x-axis
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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 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.eop.nutation         | Earth nutation
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
S | pos.errorEllipse         | Positional error ellipse
Q | pos.frame                | Reference frame used for positions (FK5, ICRS,..)
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 parallax
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
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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 fwhm
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...)
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.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.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
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                | Generic statistical arameter
Q | stat.probability          | Probability
P | stat.snr                  | Signal to noise ratio
P | stat.stdev                | Standard deviation
S | stat.uncalib              | Qualifier of a generic incalibrated quantity
Q | stat.value                | Miscellaneous statistical 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.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 v1.2

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.continuum, 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.

References

[1] R. Hanisch, *Resource Metadata for the Virtual Observatory* , http://www.ivoa.net/Documents/latest/RM.html
[2] R. Hanisch, M. Dolensky, M. Leoni, *Document Standards Management: Guidelines and Procedure* , http://www.ivoa.net/Documents/latest/DocStdProc.html