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## Utype list for the Characterisation Data Model Version 1.0

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**This version:**

<http://www.ivoa.net/Documents/UtypeListCharacterisationDM1.1.html>

**Latest version:**

<http://www.ivoa.net/Documents/latest/CharacterisationDM.html>

**Previous versions:**

no

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### Abstract

We present here the list of utypes for the Characterisation data model version 1.1.

### Acknowledgements

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## Status of this document

This is a complement to the Characterisation DM IVOA draft available at :

<http://alinda.u-strasbg.fr/Model/Characterisation/CharacterisationIvoadraft-v1.1.pdf>.

In discussion in the Char DM subgroup.

## 1 Introduction

Here is a list of Utypes derived from the Characterisation data model and made explicit to the user. Each item is listed with its name, meaning, and data type or structure used to store the corresponding values of this item. It is derived from the XML serialisation of the Model and inherits its tree structure. An extra column is provided with the status for compliance of each metadata. An Xml description is compliant to the Characterisation DM if it contains at least all the mandatory fields.

## 2 Some interpretation rules

All Utypes below are prefixed by the "cha:" namespace in order to mention the Data model it has been built from. The first level elements of the Utypes tree are then : **CharacterisationAxis**, shorten as **ChAxis** in the tables below. The mandatory status of each element is expressed at two different levels: the status of main elements is expressed in uppercase while the one of sub elements is expressed in lower case, with respect to its parent element. For instance ChAxis.resolution **SHOULD** be given, and therefore has a RECOMMENDED status: **R**; if this element is present, then the sub-element ChAxis.resolution.ResolutionRefval **must** be given and therefore gets a Mandatory status: **m**.

This does not totally reflects the recursivity of this property, so we could state that (mandatory recommended optional) in lower case always represent relative mandatory status with respect to the parent element. If not specified, the default mandatory status is "optional". "Mandatory", "Recommended" and "Optional", will be coded as "M", "R", "O" respectively in the following Utypes tables.

Utype	Meaning	Type	Status
<i>ChAxis</i>	General description of the axis		M
<i>SpatialAxis</i>	General description of the spatial axis. Can replace the head <i>ChAxis</i> string in any of utypes below		o
<i>TimeAxis</i>	General description of the time axis. Can replace the head <i>ChAxis</i> string in any of utypes below		o
<i>SpectralAxis</i>	General description of the spectral axis. Can replace the head <i>ChAxis</i> string in any of utypes below		o
<i>ChAxis.AxisName</i>	Axis name (representing the physical nature of the axis like Spatial, Spectral, Time, Velocity, or any other free name)	free string	M
<i>ChAxis.calibrationStatus</i>	Defines if and how the axis is calibrated	one string in (CALIBRATED, UNCALIBRATED,RELATIVE, NORMALIZED)	r
<i>ChAxis.ucd</i>	Axis ucd: physical meaning	standard UCD vocabulary	m
<i>ChAxis.unit</i>	Default unit for the axis	controlled unit vocabulary following the VOTABLE unit definitions	m
<i>ChAxis.coordsystem</i>	Reference coordinate system for the axis	stc AstrocoordSys or xlink	m
<i>ChAxis.ObsyLoc</i>	Observatory location	stc observatoryLocationType or xlink	o
<i>ChAxis.accuracy</i>	Global accuracy description of the axis		r
<i>ChAxis.accuracy.quality</i>	A combination of flags attesting the data quality	string:free or from restricted list vocabulary	o
<i>ChAxis.accuracy.statError</i>	Statistical error of the axis		r
<i>ChAxis.accuracy.statError.flavor</i>	Type of the Error described (statistical, systematic, global ...)	Here fixed to "statistical"	
<i>ChAxis.accuracy.statError.ErrorRefVal</i>	Typical statistical Error on the axis		m if no ErrorBounds
<i>ChAxis.accuracy.statError.ErrorRefVal.ErrorReValue</i>	Typical statistical error value on the axis generic utype for Error, Error2, Error3, Error2Matrix Error3Matrix Error2Radius Error3Radius	can be 1D Error: stc:double1Type 2D Errors: stc:size2Type or double1Type (error2 radius) 3D Errors: stc:size3Type or double3Type or double1Type (error3 radius)	m

Utype	Meaning	Type	Status
ChAxis.accuracy.statError.ErrorRefVal.documentation	A description of the Error value.	Any URI type	o
ChAxis.accuracy.statError.ErrorBounds	Error value range along the axis	ErrorRefVal	m if no
ChAxis.accuracy.statError.ErrorBounds.ErrorLimits	Hi and Low values of statistical errors on this axis.	stc:coordScalarInterval	m
ChAxis.accuracy.statError.ErrorBounds.documentation	A description of the Error value range.	Any URI type	o
ChAxis.accuracy.statError.ErrorVariability	A detailed description of the local error values error values. Could be conveyed with the data as in IVOA Spectrum data model systematic error along the axis the type of the error (here systematic)	any URI type pointing to such map	o
ChAxis.accuracy.sysError	Same subtree as the statError above subtree		o
ChAxis.accuracy.sysError.flavor	Tells us if the axis is dependent or not from the others. For observable this is false. number of bins for this axis.	Type : boolean	r
ChAxis.accuracy.Error	a flag to tell if the data are undersampled.	array of 1 2 or 3 integers	r
ChAxis.independentaxis	a flag to tell if the data are regularly sampled.	boolean	o
ChAxis.numBins		boolean	o
ChAxis.undersamplingStatus		boolean	o
ChAxis.regularsamplingStatus		boolean	o

Utype	Meaning	Type	Status
<i>ChAxis.coverage</i>	How the observation is spanned along the axis		m
<i>ChAxis.coverage.unit</i>	Redefinition of unit for coverage		o
<i>ChAxis.coverage.coordsystem</i>	Redefinition of coordsystem		o
<i>ChAxis.coverage.location</i>	Typical coordinate value on this axis		m
<i>ChAxis.coverage.location.unit</i>	Redefinition of local unit		if no bounds o
<i>ChAxis.coverage.location.coordsystem</i>	Redefinition of coordsystem		o
<i>ChAxis.coverage.location.coord</i>	The typical coordinate value.		m
<i>ChAxis.coverage.location.documentation</i>	Any kind of documentation on location metadata		o
<i>ChAxis.coverage.bounds</i>	Limits of the observation on this axis	stc:astroCoordsType any URI type	m
<i>ChAxis.coverage.bounds.unit</i>	Unit redefinition for bounds		o
<i>ChAxis.coverage.bounds.coordsystem</i>	for bounds coord system redefinition		o
<i>ChAxis.coverage.bounds.extent</i>	The size of the region delimited by the bounds and centered on Location		o
<i>ChAxis.coverage.bounds.limits</i>	The actual values defining the bounds	Implemented either as an STC:Interval (Scalar, 2DVec or 3DVec) or as a cha:CharBox of dimension 1, 2 or 3 with center + size + roll angle	m
CharBox details :			m
<i>ChAxis.coverage.bounds.limits.charBox.size2.PosAngle</i>	The roll angle of a charc box		if no location o
<i>ChAxis.coverage.bounds.limits.charBox.size2</i>	the size of the box in 1, 2 or 3D		o
<i>ChAxis.coverage.bounds.limits.charBox.value</i>	the center or reference position of the box in 1, 2 or 3D		o
<i>ChAxis.coverage.bounds.documentation</i>	A document to mention how the bounds are defined	any URI type	o

Utype	Meaning	Type	Status
<i>ChAxis.coverage.support</i>	Describes the area where measurements are effectively present and interpretable		r
<i>ChAxis.coverage.support.unit</i>	Local redefinition if needed		o
<i>ChAxis.coverage.support.coordsystem</i>	Local redefinition if needed		o
<i>ChAxis.coverage.support.Extent</i>	The size of the effectively covered region along this axis		o
<i>ChAxis.coverage.support.Area Type</i>	Gives the name of the region's shape		m
<i>ChAxis.coverage.support.Area</i>	Defines the effective covered region for this axis	predefined list of string (circle,polygon,box)	m
<i>ChAxis.coverage.support.documentation</i>	Some text about the Support metadata	stc:AstroCoordArea any URI type	o
<i>ChAxis.coverage.sensitivity</i>	Encodes the variability of the response along the axis		o
<i>ChAxis.coverage.sensitivity.unit</i>	Local redefinition if needed		o
<i>ChAxis.coverage.sensitivity.coordsystem</i>	Local redefinition if needed		o
<i>ChAxis.coverage.sensitivity.sensitivityMap</i>	A map describes the variability of the response along the axis. Can be attached to the data	implemented as anyURI type	m
<i>ChAxis.coverage.sensitivity.documentation</i>	Documents the purpose, type and encoding of sensitivity information	any URI type	m

Utype	Meaning	Type	Status
<i>ChAxis.resolution</i>	Minimum size of an interpretable signal along the axis		R
<i>ChAxis.resolution.unit</i>	Unit redefinition for whole resolution		o
<i>ChAxis.resolution.coordsystem</i>	Coord system redefinition for whole resolution		o
<i>ChAxis.resolution.resolutionRefVal</i>	Resolution Reference value		m if no bounds
<i>ChAxis.resolution.resolutionRefVal.unit</i>	Redefinition for Resolution Reference value		o
<i>ChAxis.resolution.resolutionRefVal.coordsystem</i>	Redefinition for Resolution Reference value		o
<i>ChAxis.resolution.resolutionRefVal.ReferenceValue</i>	Typical resolution value along the axis		m
<i>ChAxis.resolution.resolutionRefVal.documentation</i>	generic utype for Resolution: Resolution2, Resolution3, Resolution2Matrix, Resolution3Matrix, Resolution2Radius, Resolution3Radius	1D resolution: <code>double1Type</code> 2D resolution: <code>stc:size2Type</code> or <code>double4Type</code> 3D resolution: <code>stc:size3Type</code> or <code>double9Type</code> or <code>double1Type</code> (for resolution radius in 1D,2D,3D)	o
<i>ChAxis.resolution.resolutionRefVal.documentation</i>	Defines and explains how this reference value for resolution has been estimated	any <code>URIType</code>	o
<i>ChAxis.resolution.resolutionBounds</i>	Redefinition for resolution Bounds		r
<i>ChAxis.resolution.resolutionBounds.unit</i>	Redefinition for resolution Bounds		o
<i>ChAxis.resolution.resolutionBounds.coordsystem</i>	High and low values of resolution on this axis	<code>stc:coordScalarInterval</code> ,	o
<i>ChAxis.resolution.resolutionBounds.resolutionLimits</i>	utype for resolutionLimits		
<i>ChAxis.resolution.resolutionBounds.resolutionLimits</i>	<code>resolutionLimits2</code> , <code>resolutionLimits3</code>		
<i>ChAxis.resolution.resolutionBounds.documentation</i>	Defines and explains how this resolution has been estimated	2D or 3D <code>Vec</code>	o
<i>ChAxis.resolution.resolutionSupport</i>	Just for local redefinition		o
<i>ChAxis.resolution.resolutionSupport.unit</i>	Just for local redefinition		o
<i>ChAxis.resolution.resolutionSupport.coordsystem</i>	Set of High an Low values for resolution ranges on this axis: <code>resolutionLimits2</code> , <code>resolutionLimits3</code> cf. <code>resolutionBounds</code> . Many possibilities	<code>stc:coordScalarInterval</code>	o
<i>ChAxis.resolution.resolutionSupport.resolutionLimits</i>	Any kind of documentation on the current piece of metadata.	2D <code>Vec</code> or 3D <code>Vec</code>	m
<i>ChAxis.resolution.resolutionSupport.documentation</i>	Just for local redefinition	any <code>URIType</code>	o
<i>ChAxis.resolution.resolutionVariability</i>	Just for local redefinition		o
<i>ChAxis.resolution.resolutionVariability.unit</i>	Just for local redefinition		o
<i>ChAxis.resolution.resolutionVariability.coordsystem</i>	This map describes the variability of resolution along the axis, the varying shape of the point spread fonction, or both. Can be attached to the data	any <code>URIType</code>	o
<i>ChAxis.resolution.resolutionVariability.resolutionMap</i>	Defines and explains how this resolution variability has been estimated		m
<i>ChAxis.resolution.resolutionVariability.documentation</i>	Defines and explains how this resolution variability has been estimated	any <code>URIType</code>	m

Utype	Meaning	Type	Status
<i>ChAxis.samplingPrecision</i>	How data have been sampled along this axis		O
<i>ChAxis.samplingPrecision.unit</i>	Redefinition for <i>samplingPrecision</i>		o
<i>ChAxis.samplingPrecision.coordsystem</i>	Redefinition for <i>samplingPrecision</i>		o
<i>ChAxis.samplingPrecision.samplingRefVal</i>	Typical values for <i>samplingPrecision</i> and <i>sampleExtent</i>		m
<i>ChAxis.samplingPrecisionRefVal.unit</i>	Redefinition for <i>samplingPrecisionRefVal</i>		o
<i>ChAxis.samplingPrecisionRefVal.coordsystem</i>	Redefinition for <i>samplingPrecisionRefVal</i>		o
<i>ChAxis.samplingPrecisionRefVal.samplingPeriod</i>	Typical <i>samplingPeriod</i> value of the axis	1D value <i>stc:double1Type</i>	m
	Generic utype for the <i>samplingPeriod</i>	2D <i>stc:size2Type</i> or <i>double4Type</i>	
	<i>PixSize2</i> , <i>PixSize3</i>	or <i>double1Type</i> (radius)	
	<i>PixSize2Matrix</i> , <i>PixSize3Matrix</i> ,	3D <i>stc:size3Type</i> or <i>double9Type</i>	
	<i>PixSize2Radius</i> , <i>PixSize3Radius</i>	or <i>double1Type</i> (radius)	
<i>ChAxis.samplingPrecision.samplingPrecisionRefVal.sampleExtent</i>	Typical <i>sampleExtent</i> value of the axis	1D: <i>stc:double1Type</i>	r
	Generic utype for the <i>sampleSize</i>	2D: <i>stc:size2Type</i> or <i>double4Type</i> or <i>double1Type</i> (resolution radius)	
		3D: <i>stc:size3Type</i> or <i>double9Type</i> or <i>double1Type</i> (3 radius)	o
<i>ChAxis.samplingPrecision.samplingPrecisionRefVal.fillFactor</i>	Fill factor can be defined as the ratio of <i>sampleExtent</i> / <i>samplingPeriod</i> . Useful to know the proportion of flux actually measured	implemented as a double any URI type	o
<i>ChAxis.samplingPrecision.samplingPrecisionRefVal.documentation</i>	Explains how the <i>samplingPrecision</i> typical values are estimated		o



Utype	Meaning	Type	Status
ChAxis.samplingPrecision.samplingPrecisionBounds	Redefinition for samplingPrecision bounds		O
ChAxis.samplingPrecision.samplingPrecisionBounds.unit	Redefinition for samplingPrecision bounds High and Low values of		o
ChAxis.samplingPrecision.samplingPrecisionBounds.coordsystem	Sampling Period along this axis generic utype for samplingPeriodLimits1 samplingPeriodLimits2, samplingPeriodLimits3	stc:coordScalarInterval	o
ChAxis.samplingPrecision.samplingPrecisionBounds.samplingPeriodLimits	High and Low values of sampleExtent along this axis generic utype for sampleExtentLimits1 sampleExtentLimits2, sampleExtentLimits3	2D Vec or 3D Vec	m
ChAxis.samplingPrecision.samplingPrecisionBounds.samplingExtentLimits	A place to hook some explanations about "how" the samplingBounds were assessed		o
ChAxis.samplingPrecision.samplingPrecisionBounds.documentation	Redefinition for samplingPrecision Support	any URI type	o
ChAxis.samplingPrecision.samplingPrecisionSupport	Redefinition for samplingPrecision Support		o
ChAxis.samplingPrecision.samplingPrecisionSupport.unit	Set of High and Low values of		o
ChAxis.samplingPrecision.samplingPrecisionSupport.coordsystem	Sampling Period along this axis generic utype for samplingPeriodLimits1 samplingPeriodLimits2, samplingPeriodLimits3	stc:coordScalarInterval	o
ChAxis.samplingPrecision.samplingPrecisionSupport.samplingPeriodLimits	set of Hi and Low values of	2D Vec or 3D Vec	o
ChAxis.samplingPrecision.samplingPrecisionSupport.sampleExtentLimits	Sample Extent along this axis generic utype for sampleExtentLimits1 sampleExtentLimits2, sampleExtentLimits3	stc:coordScalarInterval	o
ChAxis.samplingPrecision.samplingPrecisionSupport.documentation	Explains "how" the Sampling Support was done and assessed	2D Vec or 3D VEC	o
ChAxis.samplingPrecision.samplingPrecisionVariability	Redefinition for sampling variability	any URI type	r
ChAxis.samplingPrecision.samplingPrecisionVariability.unit	Redefinition for sampling variability		O
ChAxis.samplingPrecision.samplingPrecisionVariability.coordsystem	This map describes the variability of the sampling along the axis, or the varying shape of the sampling function, or both. Can be seen as explanatory data	any URI type	o
ChAxis.samplingPrecision.samplingPrecisionVariability.samplingPrecisionMap	Explains how the samplingPrecision variation map has been assessed	any URI type	r

## Updates of this document

- Changed mandatory relative status of ErrorRefVal and ErrorBounds relative to ChAxis.accuracy.statErrors and sysError
- update pixel size comments in samplingPrecision.samplingPeriod and samplingExtent