Characterisation2 path-utypes and design of a « CharTAP » service

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Characterisation 2 status

- Internal draft available since August 2011
- Working draft available since December 2012
  - No comment at the moment
  - A generic ToolKit model ?
- Utype list available, Xml and UML revisited
- Implementation issue: a proposed solution

Excerpt of Char2 utype list

Description of spatial axis properties.			
Utype	Meaning	Type	Status
char.spatialAxis			
char.spatialAxis			
char.spatialAxis.axisName			
char.spatialAxis.ucd			
char.spatialAxis.unit			
char.spatialAxis.coordsystem			
char.spatialAxis.ObsyLoc		stc:ObservatoryLocation	
char.spatialAxis.accuracy			
char.spatialAxis.accuracy.quality			
char.spatialAxis.accuracy.statError			
char.spatialAxis.accuracy.statError.refVal			
char.spatialAxis.accuracy.statError.refVal.CError		stc:Error	
char.spatialAxis.accuracy.statError.refVal.CError		stc:Error2	
char.spatialAxis.accuracy.statError.refVal.CError		stc:Error2Radius	
char.spatialAxis.accuracy.statError.refVal.CError		stc:Error2Matrix	
char.spatialAxis.accuracy.statError.refVal.CError		stc:Error3	
char.spatialAxis.accuracy.statError.refVal.CError		stc:Error3Radius	
char.spatialAxis.accuracy.statError.refVal.CError		stc:Error3Matrix	
char.spatialAxis.accuracy.statError.bounds			
char.spatialAxis.accuracy.statError.bounds.limits		stc:coord1ScalarInterval	
char.spatialAxis.accuracy.statError.bounds.limits		stc:coord2VecInterval	
char.spatialAxis.accuracy.statError.bounds.limits		stc:coord3VecInterval	
char.spatialAxis.accuracy.statError.variationMap			
char.spatialAxis.accuracy.statError.variationMap.Type			
char.spatialAxis.accuracy.statError.variationMap.DataModel			
char.spatialAxis.accuracy.statError.variationMap.Access			
char.spatialAxis.accuracy.statError.variationMap.Access.			
char.spatialAxis.accuracy.statError.variationMap.Access.Format			
char.spatialAxis.accuracy.statError.variationMap.Access.Size			
char.spatialAxis.accuracy.statError.variationMap.Access.access_reference			
char.spatialAxis.accuracy.statError.variationMap.Access.Moment			
char.spatialAxis.accuracy.statError.variationMap.Access.Parametric			
char.spatialAxis.accuracy.sysError			
char.spatialAxis.accuracy.sysError.refVal			
char.spatialAxis.accuracy.sysError.refVal.CError		stc:Error	
char.spatialAxis.accuracy.sysError.refVal.CError		stc:Error2	
char.spatialAxis.accuracy.sysError.refVal.CError		stc:Error2Radius	
char.spatialAxis.accuracy.sysError.refVal.CError		stc:Error2Matrix	
char.spatialAxis.accuracy.sysError.refVAl.CError		stc:Error3	
char.spatialAxis.accuracy.sysError.refVal.CError		stc:Error3Radius	

Excerpt of Char2 utype list

Accuracy along this Characterisation Axis			
Utype	Meaning	Type	Status
char.spatialAxis.accuracy.sysError.refVal.CError		stc:Error3Matrix	
char.spatialAxis.accuracy.sysError.bounds			
char.spatialAxis.accuracy.sysError.bounds.limits		stc:coord1ScalarInterval	
char.spatialAxis.accuracy.sysError.bounds.limits		stc:coord2VecInterval	
char.spatialAxis.accuracy.sysError.bounds.limits		stc:coord3VecInterval	
char.spatialAxis.accuracy.CustError			
char.spatialAxis.accuracy.CustError.refVal			
char.spatialAxis.accuracy.CustError.refVal.CError		stc:Error	
char.spatialAxis.accuracy.CustError.refVal.CError		stc:Error2	
char.spatialAxis.accuracy.CustError.refVal.CError		stc:Error2Radius	
char.spatialAxis.accuracy.CustError.refVal.CError		stc:Error2Matrix	
char.spatialAxis.accuracy.CustError.refVal.CError		stc:Error3	
char.spatialAxis.accuracy.CustError.refVAl.CError		stc:Error3Radius	
char.spatialAxis.accuracy.CustError.refVal.CError		stc:Error3Matrix	
char.spatialAxis.accuracy.statError.bounds			
char.spatialAxis.accuracy.CustError.bounds.limits		stc:coord1ScalarInterval	
char.spatialAxis.accuracy.CustError.bounds.limits		stc:coord2VecInterval	
char.spatialAxis.accuracy.CustError.bounds.limits		stc:coord3VecInterval	
char.spatialAxis.independentAxis			
char.spatialAxis.calibrationStatus			
char.spatialAxis.numBins			
char.spatialAxis.numBins.l1			
char.spatialAxis.numBins.l2			
char.spatialAxis.numBins.l3			
char.spatialAxis.undersamplingStatus			
char.spatialAxis.regularsamplingStatus			
char.spatialAxis.coverage			
char.spatialAxis.coverage.unit			
char.spatialAxis.coverage.coordsystem			
char.spatialAxis.coverage.location			
char.spatialAxis.coverage.location.unit			
char.spatialAxis.coverage.location.coordsystem			
char.spatialAxis.coverage.location.coord		stc:AstroCoord	
char.spatialAxis.coverage.location.coord.Position2D		stc:Position2D	
char.spatialAxis.coverage.location.coord.documentation			
char.spatialAxis.coverage.bounds			
char.spatialAxis.coverage.bounds.unit			
char.spatialAxis.coverage.bounds.coordsystem			

Char 2 use cases : a reminder (Sao Paulo and ... before)

- Discovering image PSF
- Discovering response (sensitivity) maps
- Discovering resolution maps (spectral...)
- Describing composed datasets:
  - CCD mosaics
  - Polarization parameters
  - Sensitivity observables and uv planes

Char 2 Use cases exist: What kind of services to implement them

- New FIELDS in DAL responses (SSA, SIA, ObsTAP) ---> limited solution
- Ad hoc Char (or Observation) service
  - Native char xml

  ---> Client must parse them. Require a new RegExt to be regisered?
  - Mapping of classes and attributes in a TAP service

  ---> CharTAP service concept
  - Discovered via Registry or via DataLink (service or functionnality)
  - No other parsing needed than VOTABLE and utype recognition (path-utypes)

Char2 : CharTAP design

- TAP service using TAP CDS library
- TAP Schema using the following organisation
  - Per « CharAxis » container tables
  - Properties container tables for each axis
  - « Levels » as set of columns or extra tables
  - Only pertinent attributes implemented
  - Linkage done by Foreign Keys

Example 1: PSF ADQL Query (simplified)

- SELECT spatialAxis.PubDID,
  spatialAxis.resolutionRefval,
  spatialAxis.resolutionPSF_Type,
  spatialAxis.resolutionPSF_Format,
  spatialAxis.resolutionPSF_Access

  FROM spatialAxis

  WHERE spatialAxis.PubDID = « .... »

---> 5 columns , 1 row

Example 2 : Image sensivity map query (simplified)

- SELECT spatialAxis.PubDID, spatialAxis.locationCoord, spatialAxis.sensitivityMapReference FROM spatialAxis

  WHERE INTERSECTS(locationCoord, CIRCLE('ICRS', 161.0, -52., 2.)) = 1

---> 3 columns, 10 rows

Example 3 : Polarization parameter ranges (simplified)

- SELECT observableAxis.PubDID, observableAxis.name, observableAxis.ucd, observableAxis.coverageRange

  FROM observableAxis

  WHERE spatialAxis.PubDID = « .... »

--->4 columns, 4 rows (one per Stokes Parameter)

Problems and Issues

- ADQL query for « normal » TABLES may be huge
- Problem
  - Is not in interpreting the output (path-utypes are there and give the column role)
  - but in generating the query

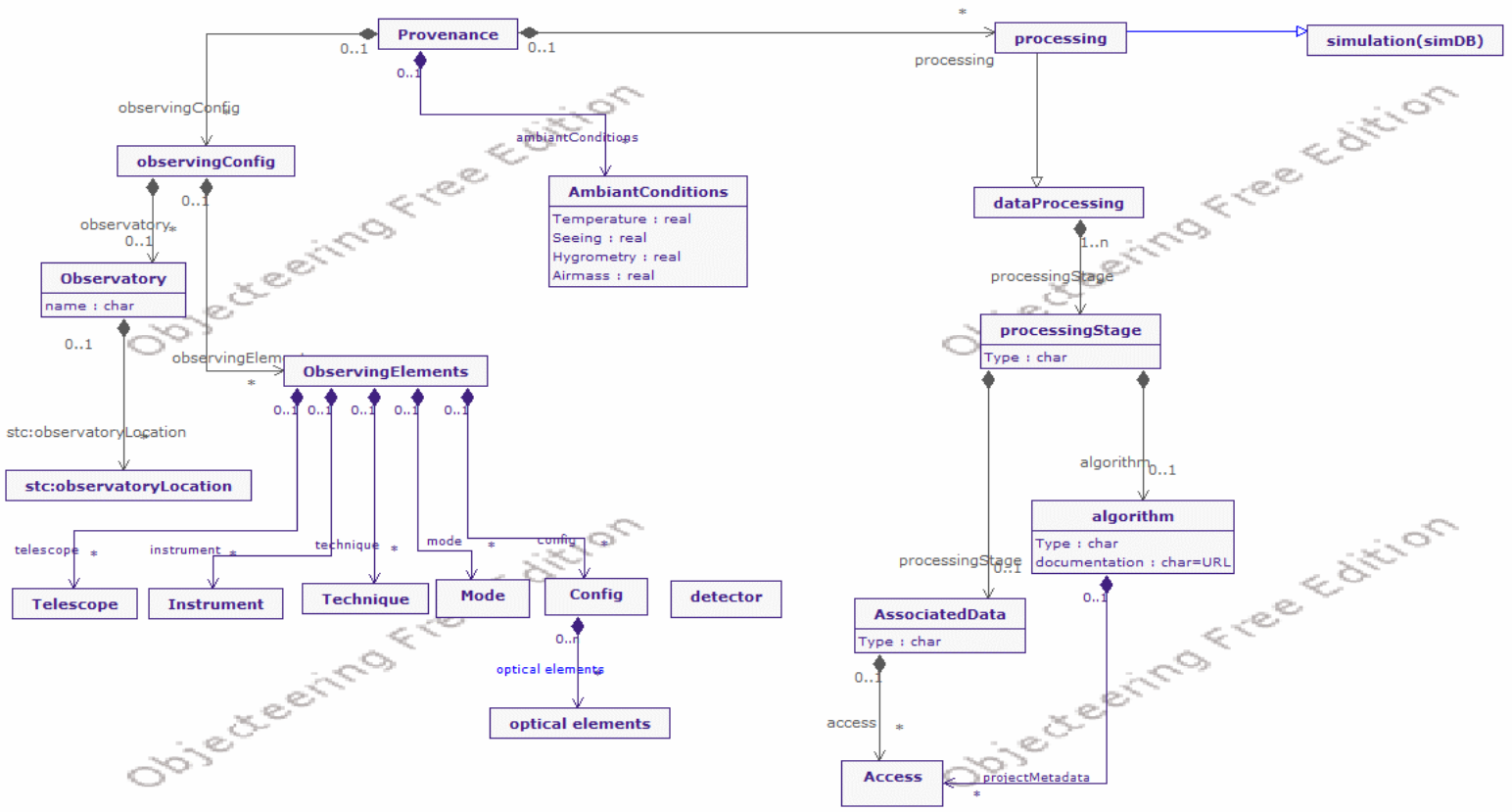
Problems and Issues

- ADQL query generation may require model based interface (independant of retrieved VOTABLES)
- VO-DML discussion:
  - Utypes to be let at the FIELD level for easy parsing of small tables
  - VO-DML structure may help for client development. May be attached to TAP schema, not to individual Tables

POSSIBLE extensions of the system towards provenance

- Use cases :
  - give temperature, seeing and wind velocity at observation time
  - Retrieve raw data and path to processing algo
- Provenance model proposed in Sao Paulo splinter meeting (and before)
- containerTables: Ambiant_conditions, Observation_Configuration, Processing

Provenance UML Diagram (Preliminary)



Next

DEMO in Hawaï