



# Observation Data Model
# Characterisation 2, Provenance

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# Acknowledgements


- Recent discussions with:
  - Fabien Chereau ,
  - Alberto Micol,
  - Gerard Lemson
  - and Anita Richards

# Observation Data Model

- Set of packages such as
  - Curation,
  - DatasetID,
  - Access,
  - Characterisation,
  - Provenance
- Model for Generic Dataset Protocol
- Reuse Spectrum/charac (and STC), build provenance
- Observation container applications : ObsID/footprint (FoV) linkage. store dataset metadat for VOSPACE

# Characterisation: towards version 2

- Models are complex ? Not that much but some implementation details are ill defined. Lack of applications.
- Simplification for implementation:
  - Standard utype definition (see Mireille's proposal)
  - Xml schema « good practice » compliance
    - No exportable elements (only types)
    - Neither choice nor Substition groups but
    - Extension/restiction on basic TypesI
  - Table of aliases ?
  - Changing the names in the schema?
- Complex data (CCD Mosaics, heterogeneous data sets, etc …)
- VariationMaps :
  - Level 4
  - Goal is to give local response on the axes properties: eg « spatial sensitivity », error maps, resolution maps… Usefull for processing

# Utypes simplification

## Solution 1 (Mireille)

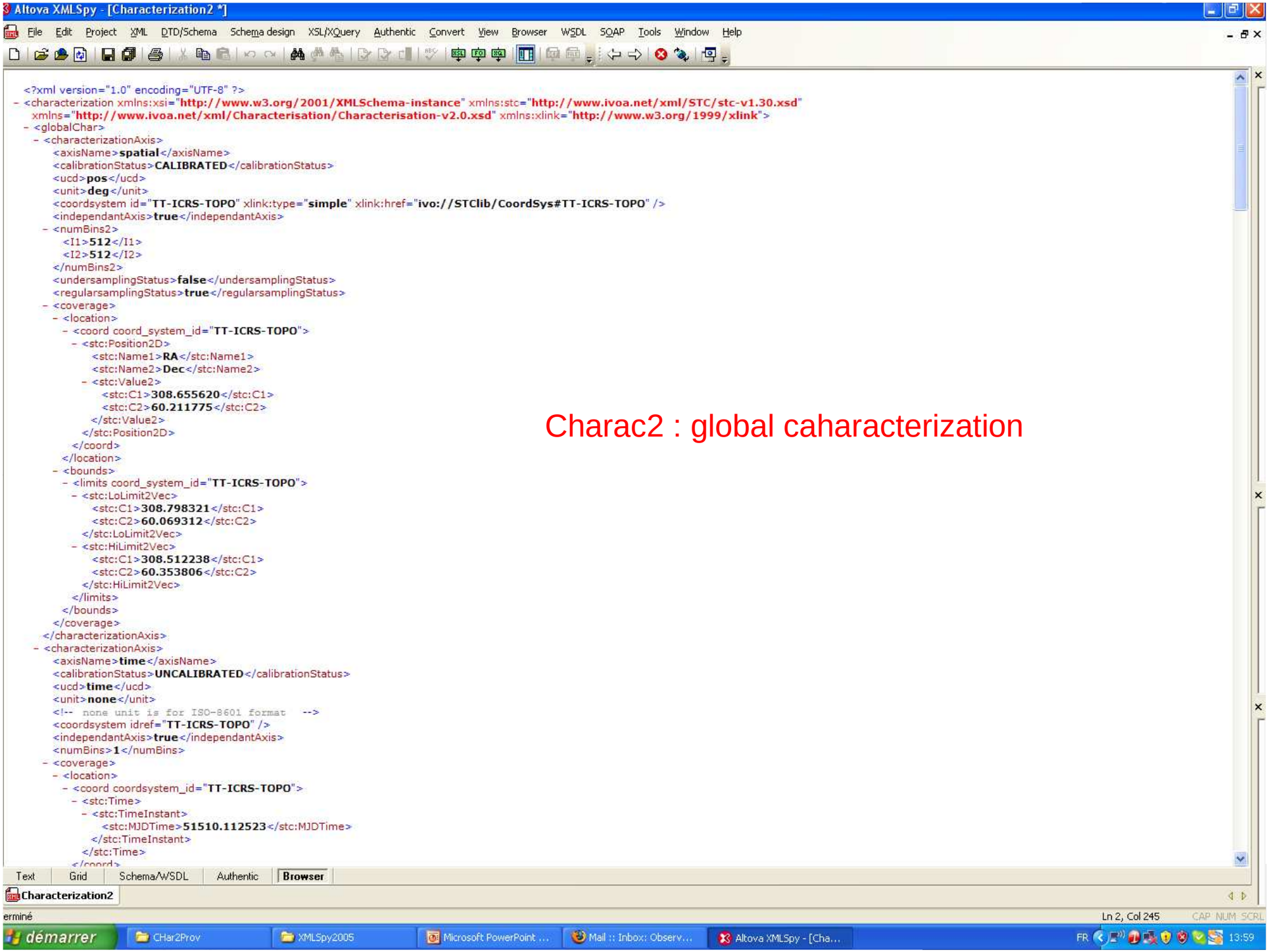
- Don’t change the model , but shortage of some elements names in the schema

| | |
|---|---|
| ***ChAxis.coverage*** | ***ChAxis.cov*** |
| ***ChAxis.coverage.location*** | ***ChAxis.cov.location*** |
| ***ChAxis.coverage.location.coord*** | ***ChAxis.cov.location.coord*** |

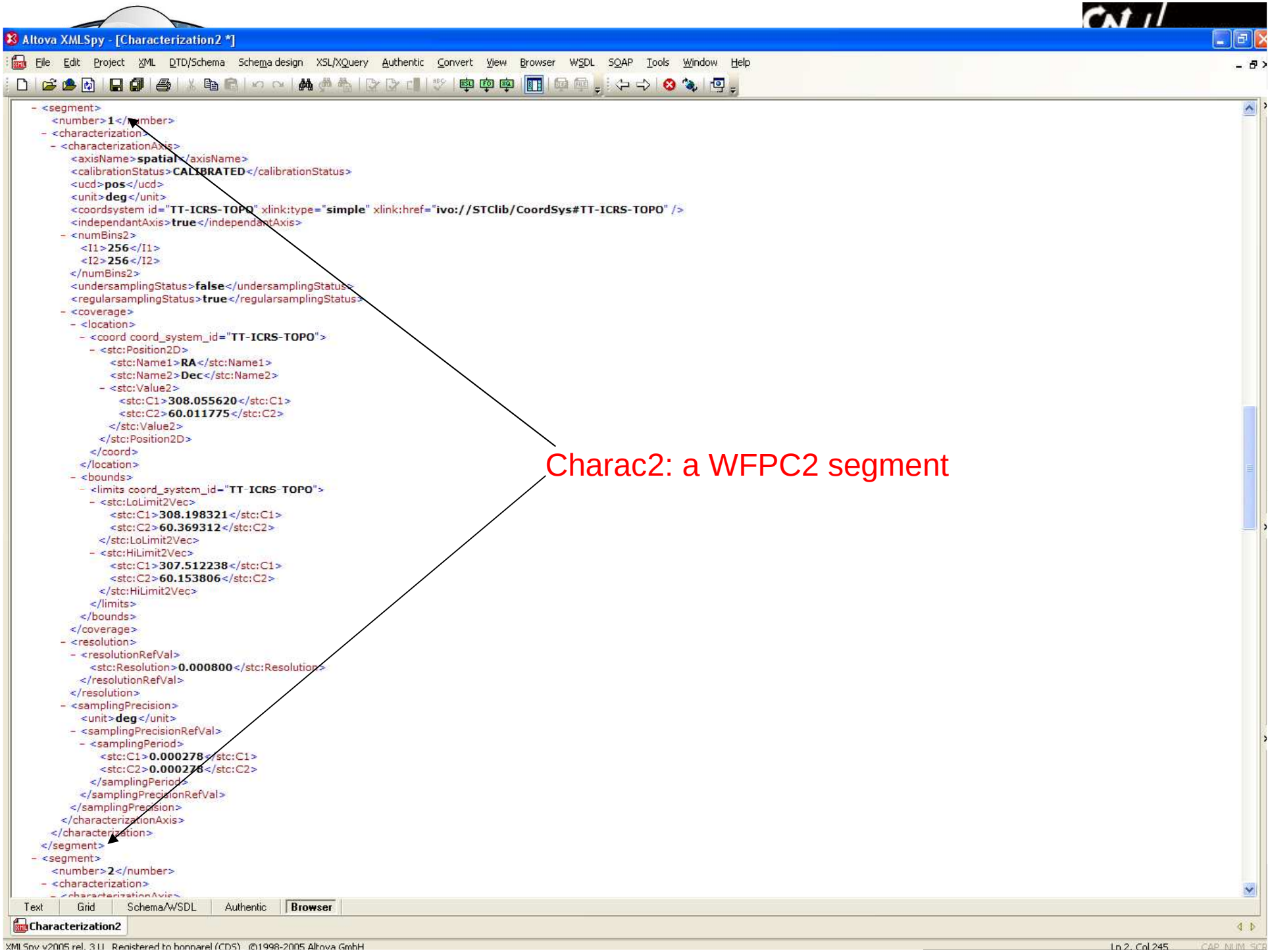
## Solution 2 (François)

- Table of short aliases (eg for an appli or a given protocol)

| | |
|---|---|
| ***ChAxis.coverage*** | ***coverage*** |
| ***ChAxis.coverage.location*** | ***locationQty*** |
| ***ChAxis.coverage.location.coord*** | ***location*** |




Charac2 : global caharacterization


Altova XMLSpy - [Characterization2 *]
File Edit Project XML DTD/Schema Schema design XSL/XQuery Authentic Convert View Browser WSDL SOAP Tools Window Help
- 
<number>1</number>
- <characterization>
- <characterizationAxis>
<axisName>spatial</axisName>
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<ucd>pos</ucd>
<unit>deg</unit>
<coordsystem id="TT-ICRS-TOPO" xlink:type="simple" xlink:href="ivo://STClib/CoordSys#TT-ICRS-TOPO" />
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- <numBins2>
<I1>256</I1>
<I2>256</I2>
</numBins2>
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<regularsamplingStatus>true</regularsamplingStatus>
- <coverage>
- <location>
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- <stc:Position2D>
<stc:Name1>RA</stc:Name1>
<stc:Name2>Dec</stc:Name2>
- <stc:Value2>
<stc:C1>308.055620</stc:C1>
<stc:C2>60.011775</stc:C2>
</stc:Value2>
</stc:Position2D>
</coord>
</location>
- <bounds>
- <limits coord_system_id="TT-ICRS-TOPO">
- <stc:LoLimit2Vec>
<stc:C1>308.198321</stc:C1>
<stc:C2>60.369312</stc:C2>
</stc:LoLimit2Vec>
- <stc:HiLimit2Vec>
<stc:C1>307.512238</stc:C1>
<stc:C2>60.153806</stc:C2>
</stc:HiLimit2Vec>
</limits>
</bounds>
</coverage>
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- <resolutionRefVal>
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</resolutionRefVal>
</resolution>
- <samplingPrecision>
<unit>deg</unit>
- <samplingPrecisionRefVal>
- <samplingPeriod>
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<stc:C2>0.000278</stc:C2>
</samplingPeriod>
</samplingPrecisionRefVal>
</samplingPrecision>
</characterizationAxis>
</characterization>

- 
<number>2</number>
- <characterization>
Charac2: a WFPC2 segment
Text Grid Schema/WSDL Authentic Browser
Characterization2
XMLSpy v2005 rel. 3 U Registered to hopparel (CDS) ©1998-2005 Altova GmbH
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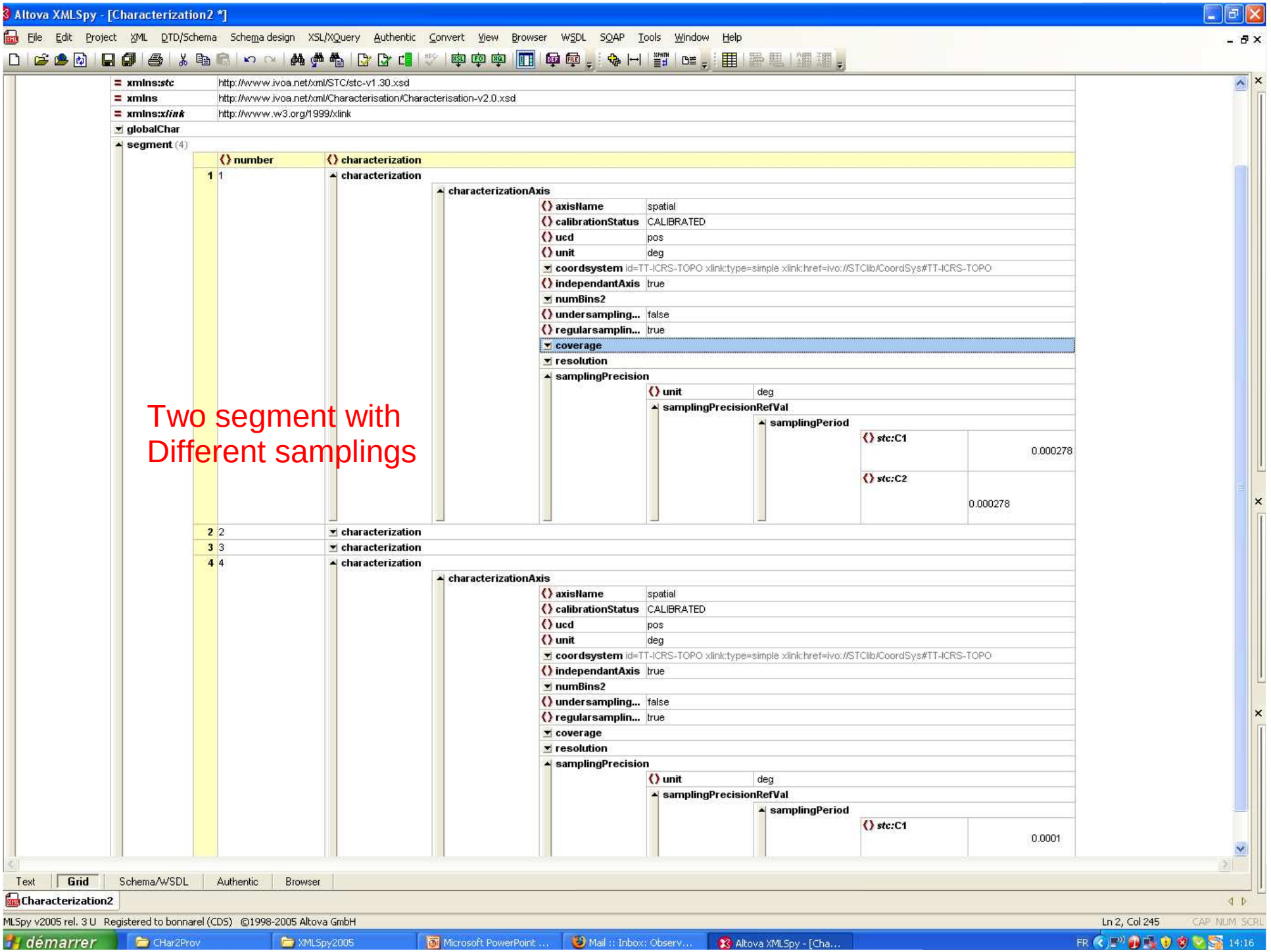
Altova XMLSpy - [Characterization2 *]
File Edit Project XML DTD/Schema Schema design XSL/XQuery Authentic Convert View Browser WSDL SOAP Tools Window Help
xmlns:stc http://www.ivoa.net/xml/STC/stc-v1.30.xsd
xmlns http://www.ivoa.net/xml/Characterisation/Characterisation-v2.0.xsd
xmlns:xlink http://www.w3.org/1999/xlink
globalChar
segment (4)
number
characterization
1 1
characterization
characterizationAxis
axisName spatial
calibrationStatus CALIBRATED
ucd pos
unit deg
coordsystem id=TT-ICRS-TOPO xlink:type=simple xlink:href=ivo://STClib/CoordSys#TT-ICRS-TOPO
independantAxis true
numBins2
undersampling... false
regularsamplin... true
coverage
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samplingPrecision
unit deg
samplingPrecisionRefVal
samplingPeriod
stc:C1 0.000278
stc:C2 0.000278
2 2
characterization
3 3
characterization
4 4
characterization
characterizationAxis
axisName spatial
calibrationStatus CALIBRATED
ucd pos
unit deg
coordsystem id=TT-ICRS-TOPO xlink:type=simple xlink:href=ivo://STClib/CoordSys#TT-ICRS-TOPO
independantAxis true
numBins2
undersampling... false
regularsamplin... true
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unit deg
samplingPrecisionRefVal
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Two segment with
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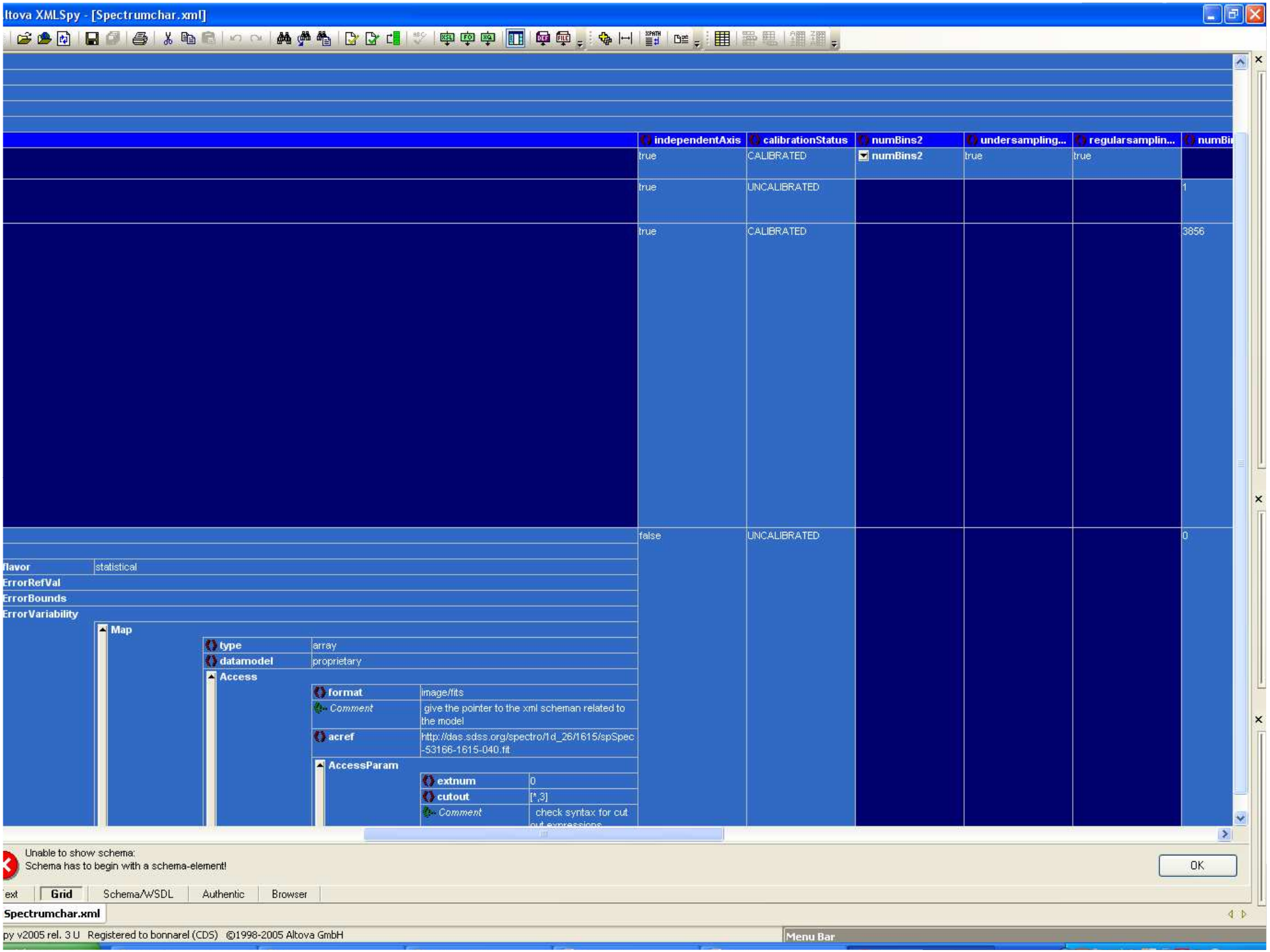
ltova XMLSpy - [Spectrumchar.xml]
independentAxis
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numBins2
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regularsamplin...
numBi
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true
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3856
false
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lavor
statistical
ErrorRefVal
ErrorBounds
ErrorVariability
Map
type
array
datamodel
proprietary
Access
format
image/fits
Comment
give the pointer to the xml scheman related to the model
acref
http://das.sdss.org/spectro/1d_26/1615/spSpec-53166-1615-040.fit
AccessParam
extnum
0
cutout
[*,3]
Comment
check syntax for cut
Unable to show schema:
Schema has to begin with a schema-element!
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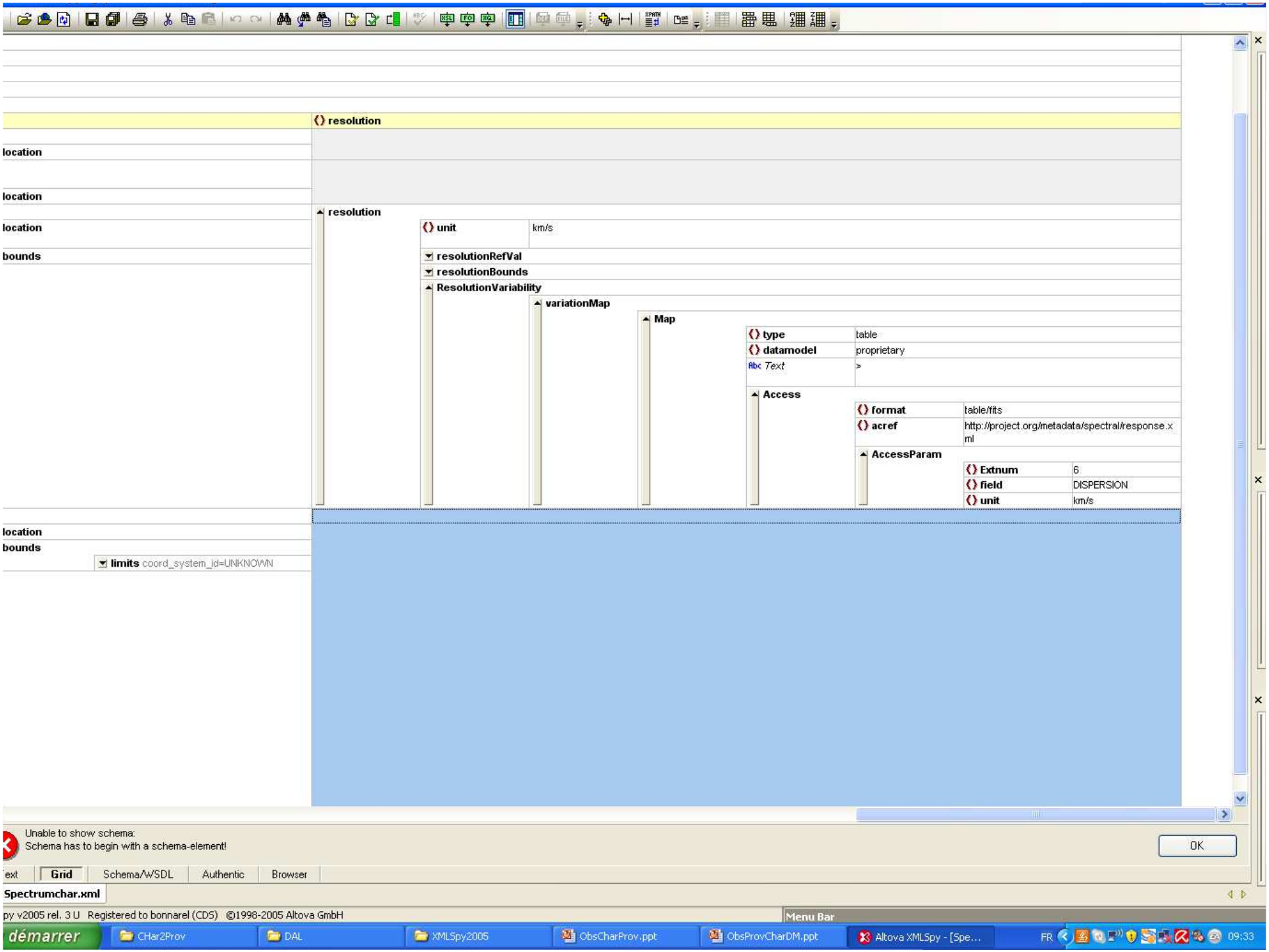
resolution
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location
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location
unit
km/s
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acref
http://project.org/metadata/spectral/response.xml
AccessParam
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limits coord_system_id=UNKNOWN
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Schema has to begin with a schema-element!
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ObsProvCharDM.ppt
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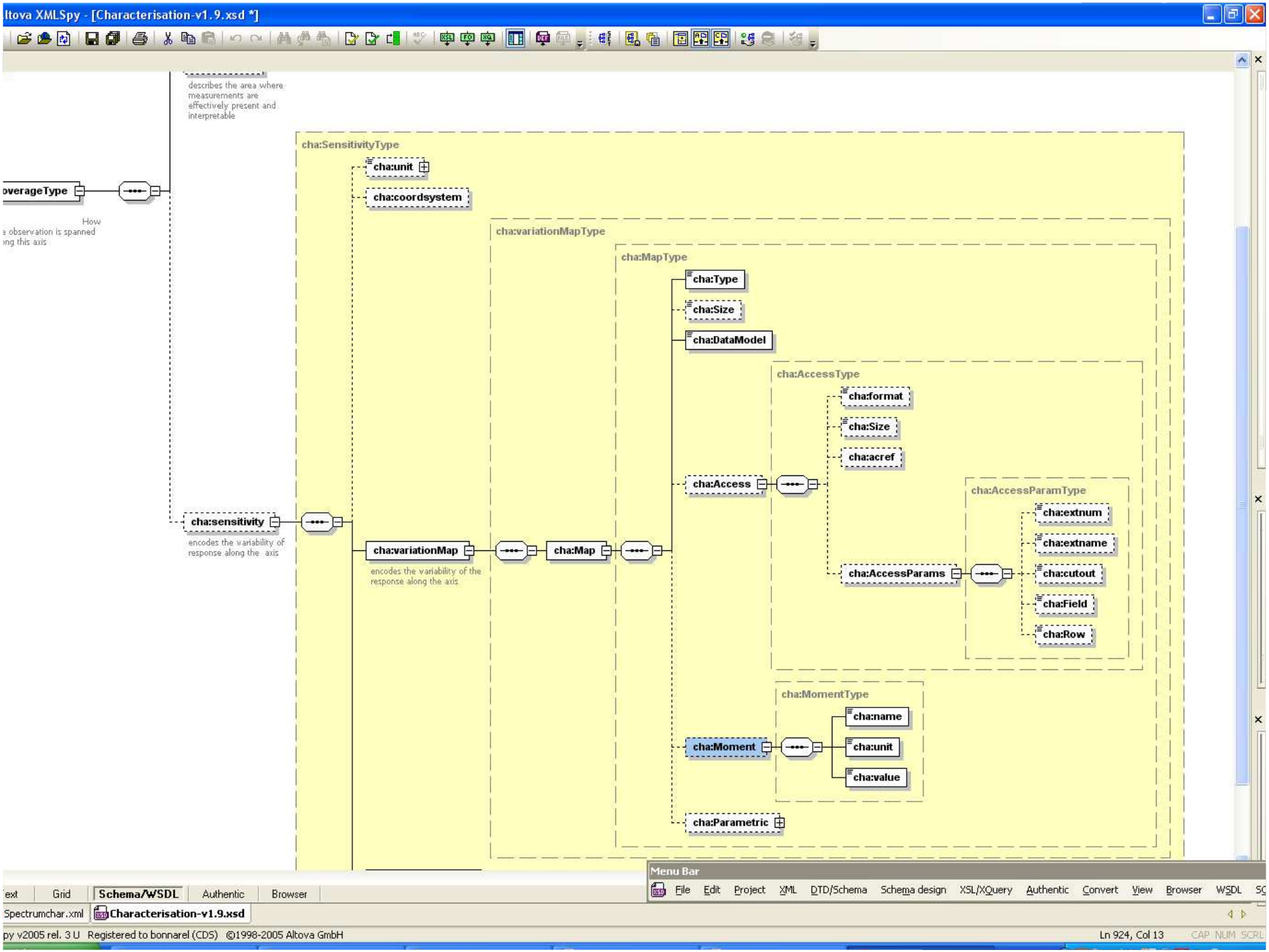
Altova XMLSpy - [Characterisation-v1.9.xsd *]
describes the area where measurements are effectively present and interpretable
overageType
How
observation is spanned
ong this axis
cha:SensitivityType
cha:unit
cha:coordsystem
cha:variationMapType
cha:MapType
cha:Type
cha:Size
cha:DataModel
cha:AccessType
cha:format
cha:Size
cha:acref
cha:Access
cha:AccessParamType
cha:extnum
cha:extname
cha:AccessParams
cha:cutout
cha:Field
cha:Row
cha:sensitivity
encodes the variability of response along the axis
cha:variationMap
encodes the variability of the response along the axis
cha:Map
cha:MomentType
cha:name
cha:Moment
cha:unit
cha:value
cha:Parametric
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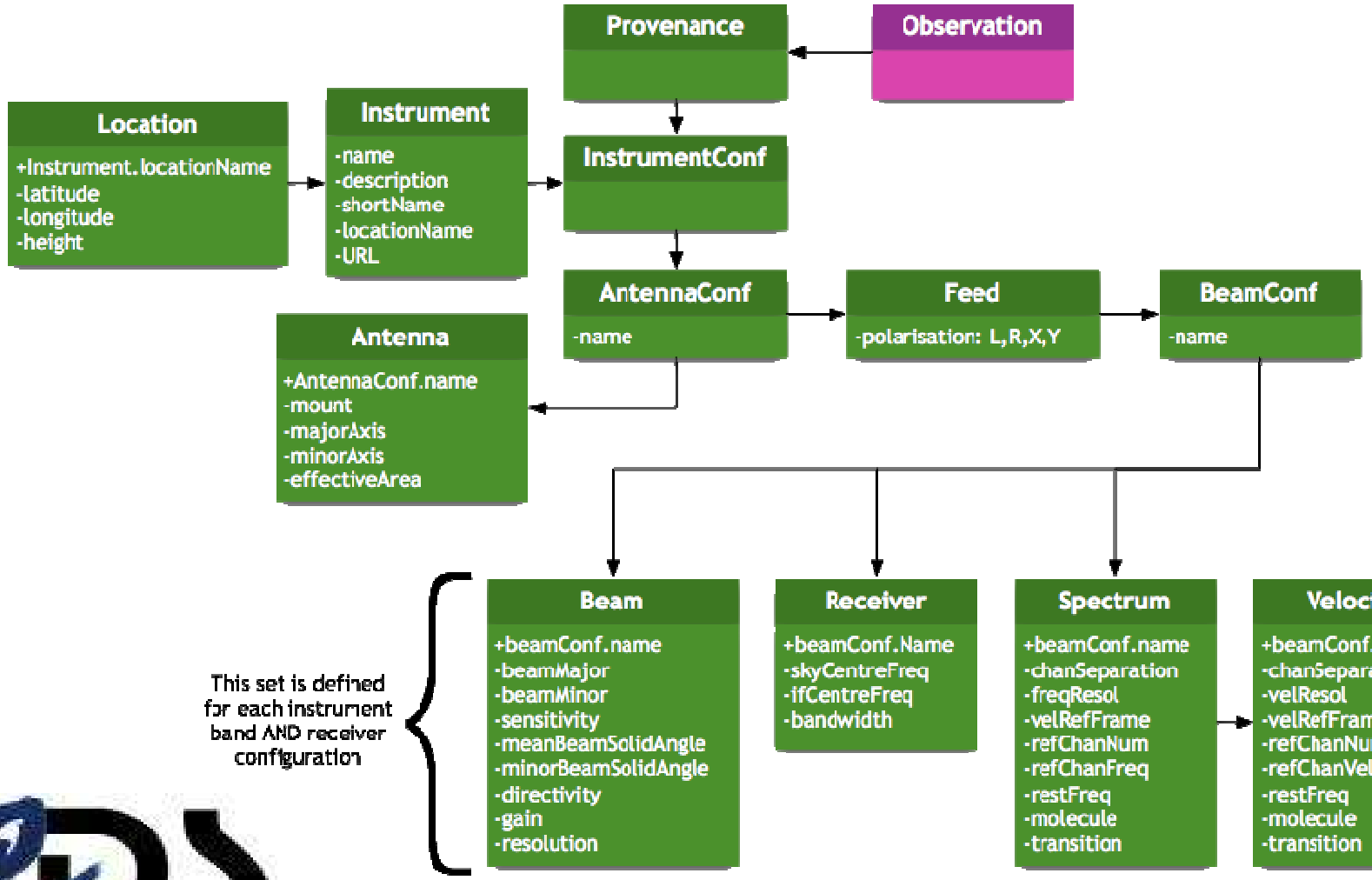
# Provenance

- It is dealing with the description of the history of the data.
- An observational dataset is the result of an instrumental and software process.
- We need to give simple enumeration of these steps with links to additional non standardized documentation and metadata

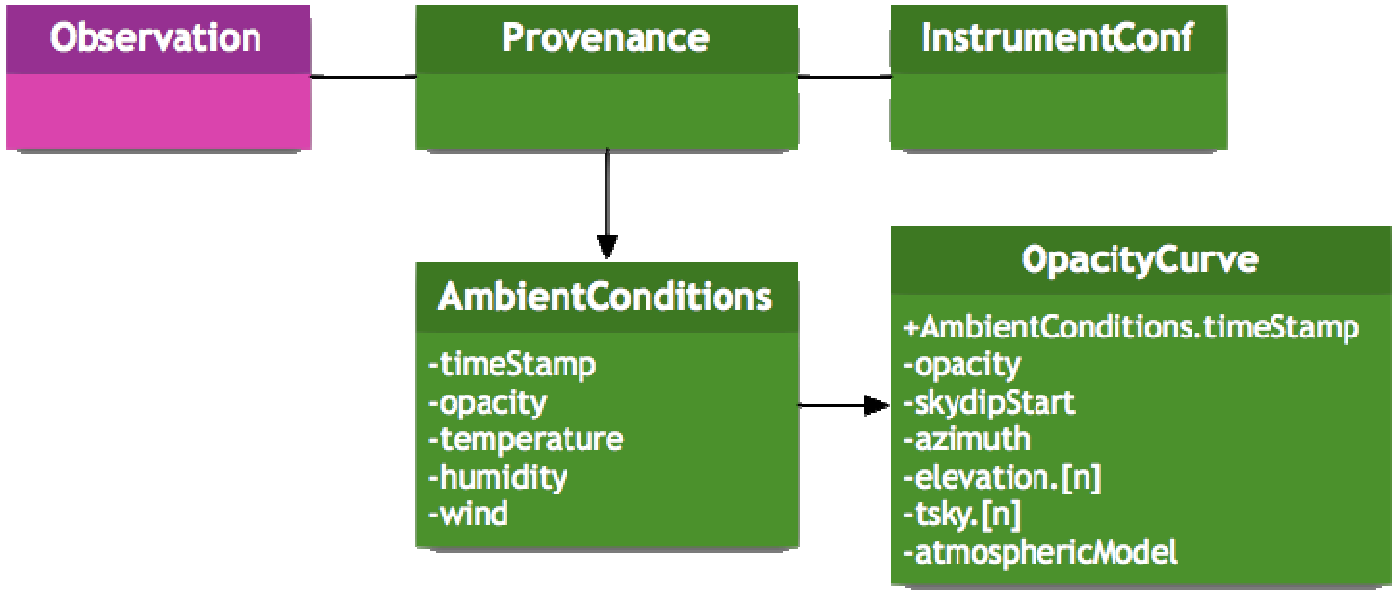

# Provenance

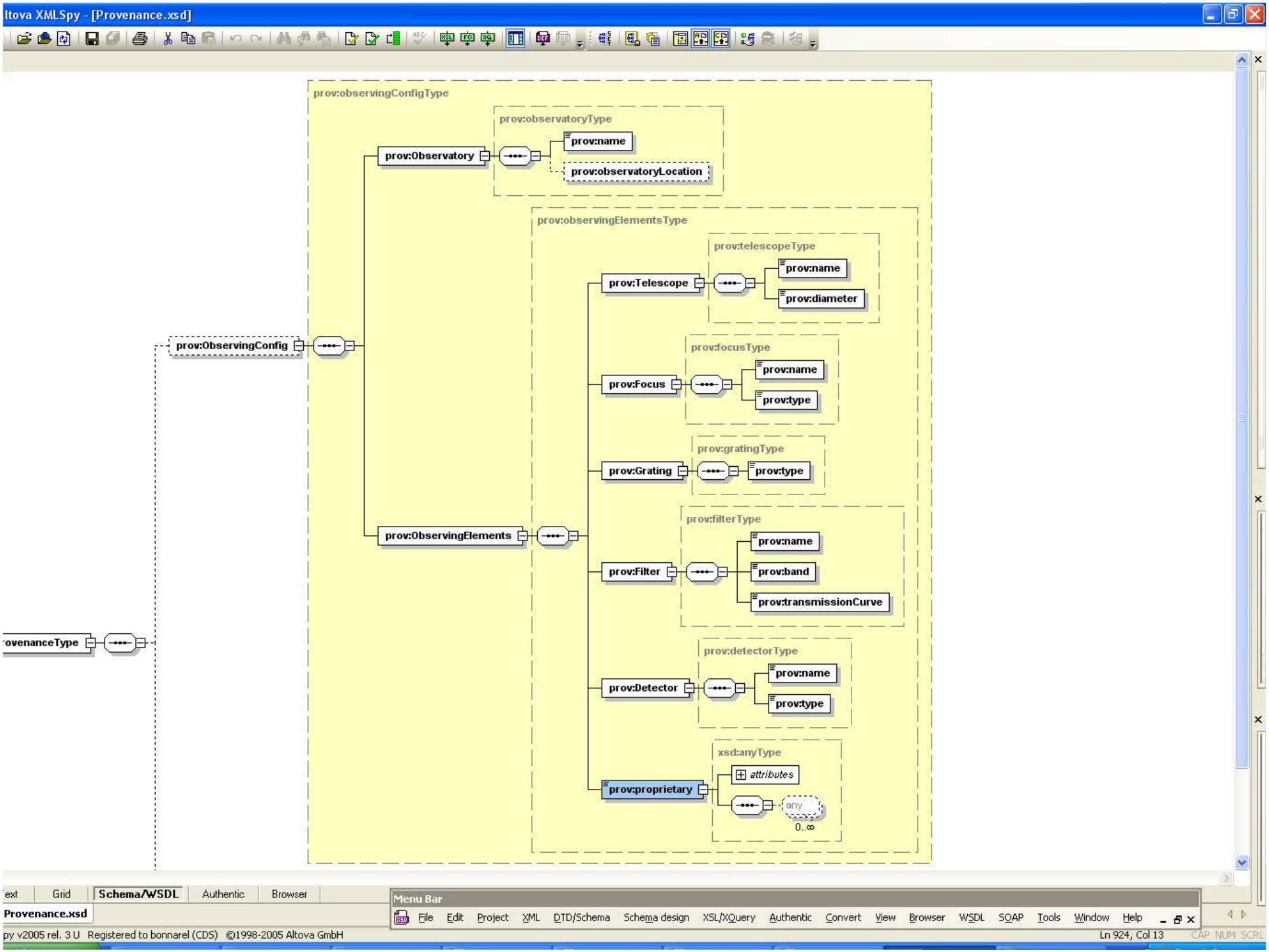
- « Provenance » has three main classes
  - « Processing » (calibration, mosaicking …)
  - « Observation Configuration » made of « Observation elements » (telescope, camera)
  - « Ambiant conditions » (like temperature)
- Priority use cases:
  - describing Filter transmission curve
  - access to Progenitors of a coadded dataset…

# Provenance.Instrument



# Provenance. AmbientConditions




ltova XMLSpy - [Provenance.xsd]
prov:observingConfigType
prov:observatoryType
prov:Observatory
prov:name
prov:observatoryLocation
prov:observingElementsType
prov:telescopeType
prov:Telescope
prov:name
prov:diameter
prov:ObservingConfig
prov:focusType
prov:Focus
prov:name
prov:type
prov:gratingType
prov:Grating
prov:type
prov:ObservingElements
prov:filterType
prov:Filter
prov:name
prov:band
prov:transmissionCurve
ovenanceType
prov:detectorType
prov:Detector
prov:name
prov:type
xsd:anyType
prov:proprietary
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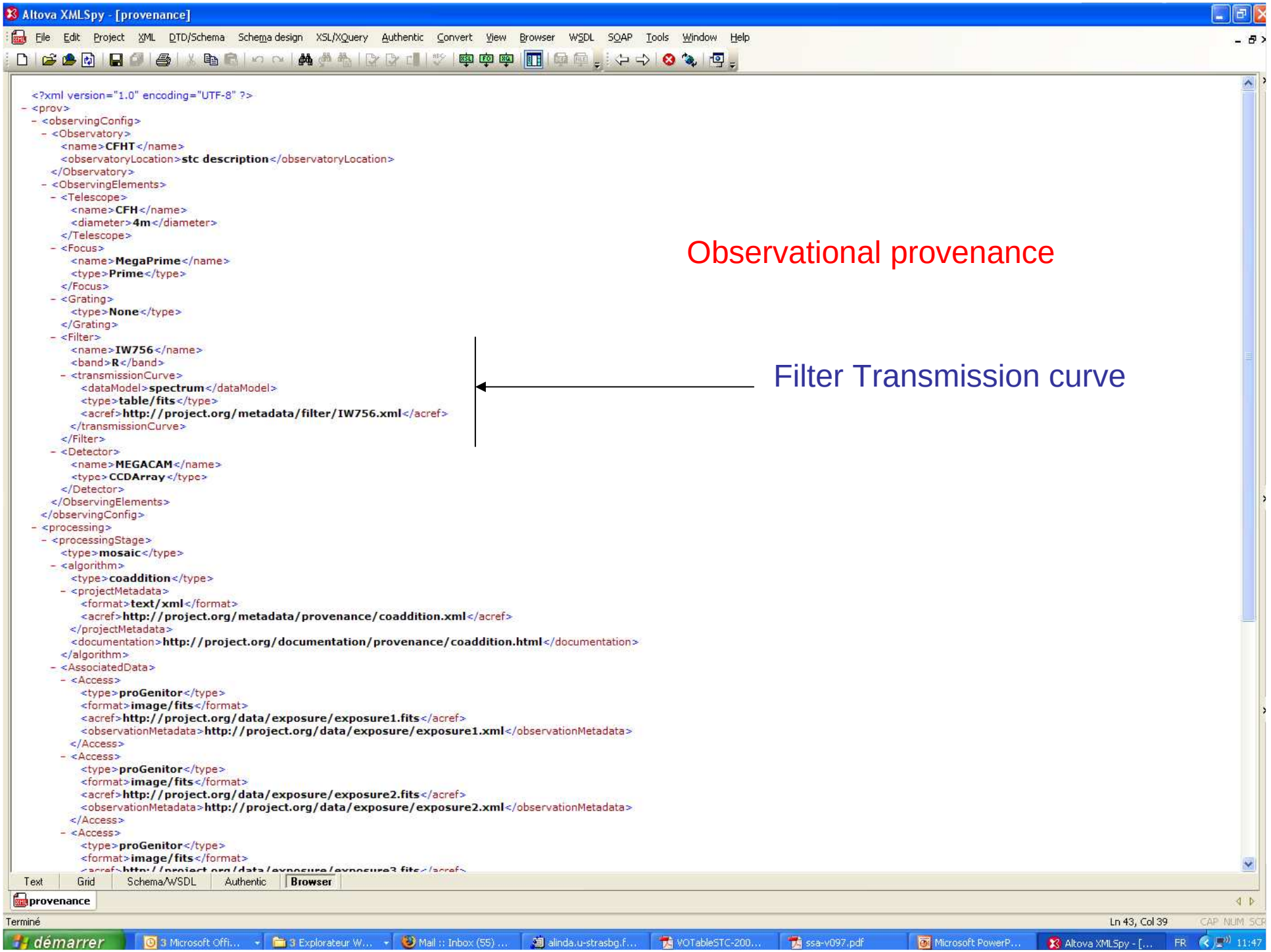
Altova XMLSpy - [provenance]
File Edit Project XML DTD/Schema Schema design XSL/XQuery Authentic Convert View Browser WSDL SOAP Tools Window Help
<?xml version="1.0" encoding="UTF-8" ?>
<prov>
<observingConfig>
<Observatory>
<name>CFHT</name>
<observatoryLocation>stc description</observatoryLocation>
</Observatory>
<ObservingElements>
<Telescope>
<name>CFH</name>
<diameter>4m</diameter>
</Telescope>
<Focus>
<name>MegaPrime</name>
<type>Prime</type>
</Focus>
<Grating>
<type>None</type>
</Grating>
<Filter>
<name>IW756</name>
<band>R</band>
<transmissionCurve>
<dataModel>spectrum</dataModel>
<type>table/fits</type>
<acref>http://project.org/metadata/filter/IW756.xml</acref>
</transmissionCurve>
</Filter>
<Detector>
<name>MEGACAM</name>
<type>CCDArray</type>
</Detector>
</ObservingElements>
</observingConfig>
<processing>
<processingStage>
<type>mosaic</type>
<algorithm>
<type>coaddition</type>
<projectMetadata>
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<acref>http://project.org/metadata/provenance/coaddition.xml</acref>
</projectMetadata>
<documentation>http://project.org/documentation/provenance/coaddition.html</documentation>
</algorithm>
<AssociatedData>
<Access>
<type>proGenitor</type>
<format>image/fits</format>
<acref>http://project.org/data/exposure/exposure1.fits</acref>
<observationMetadata>http://project.org/data/exposure/exposure1.xml</observationMetadata>
</Access>
<Access>
<type>proGenitor</type>
<format>image/fits</format>
<acref>http://project.org/data/exposure/exposure2.fits</acref>
<observationMetadata>http://project.org/data/exposure/exposure2.xml</observationMetadata>
</Access>
<Access>
<type>proGenitor</type>
<format>image/fits</format>
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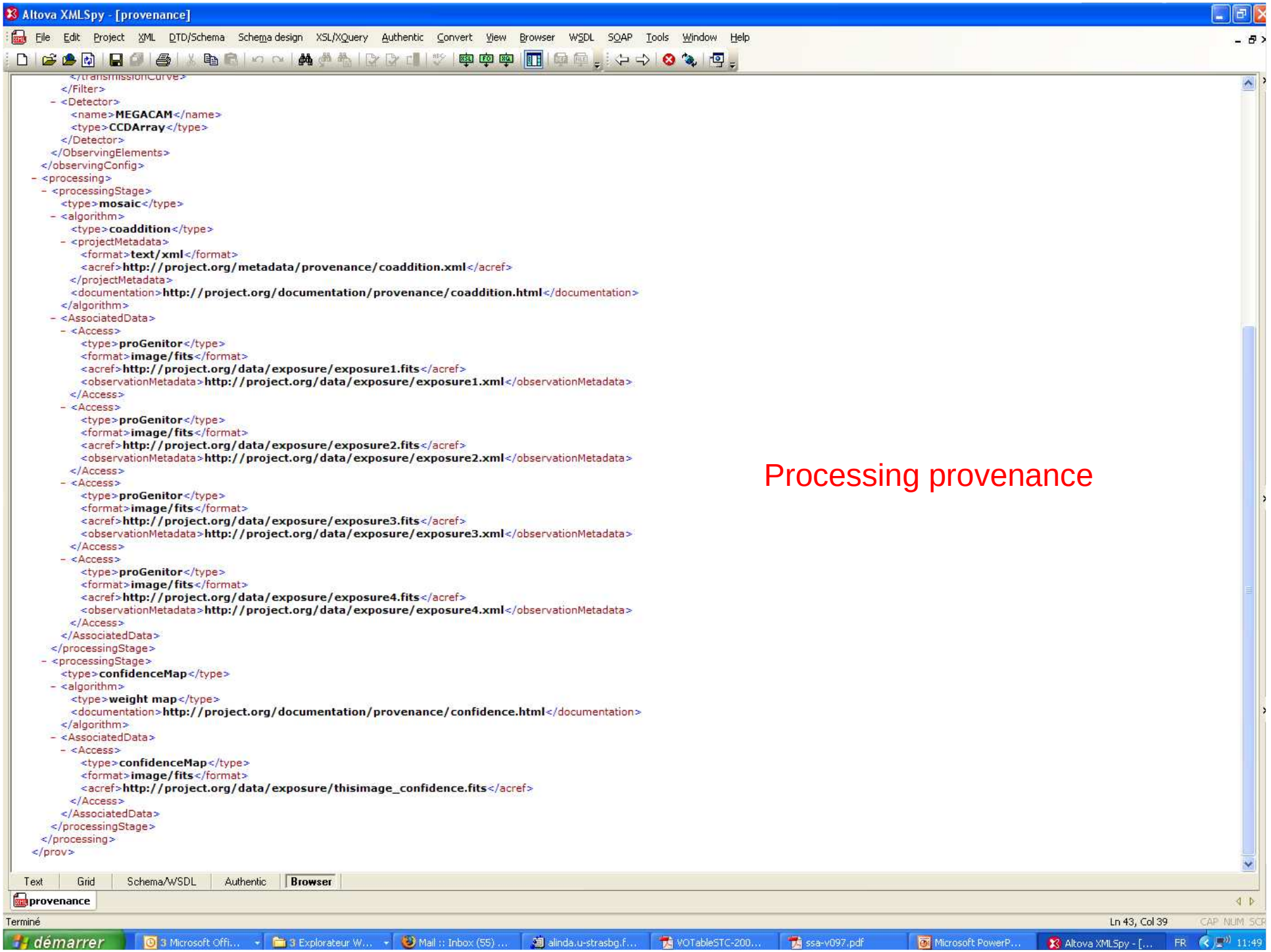
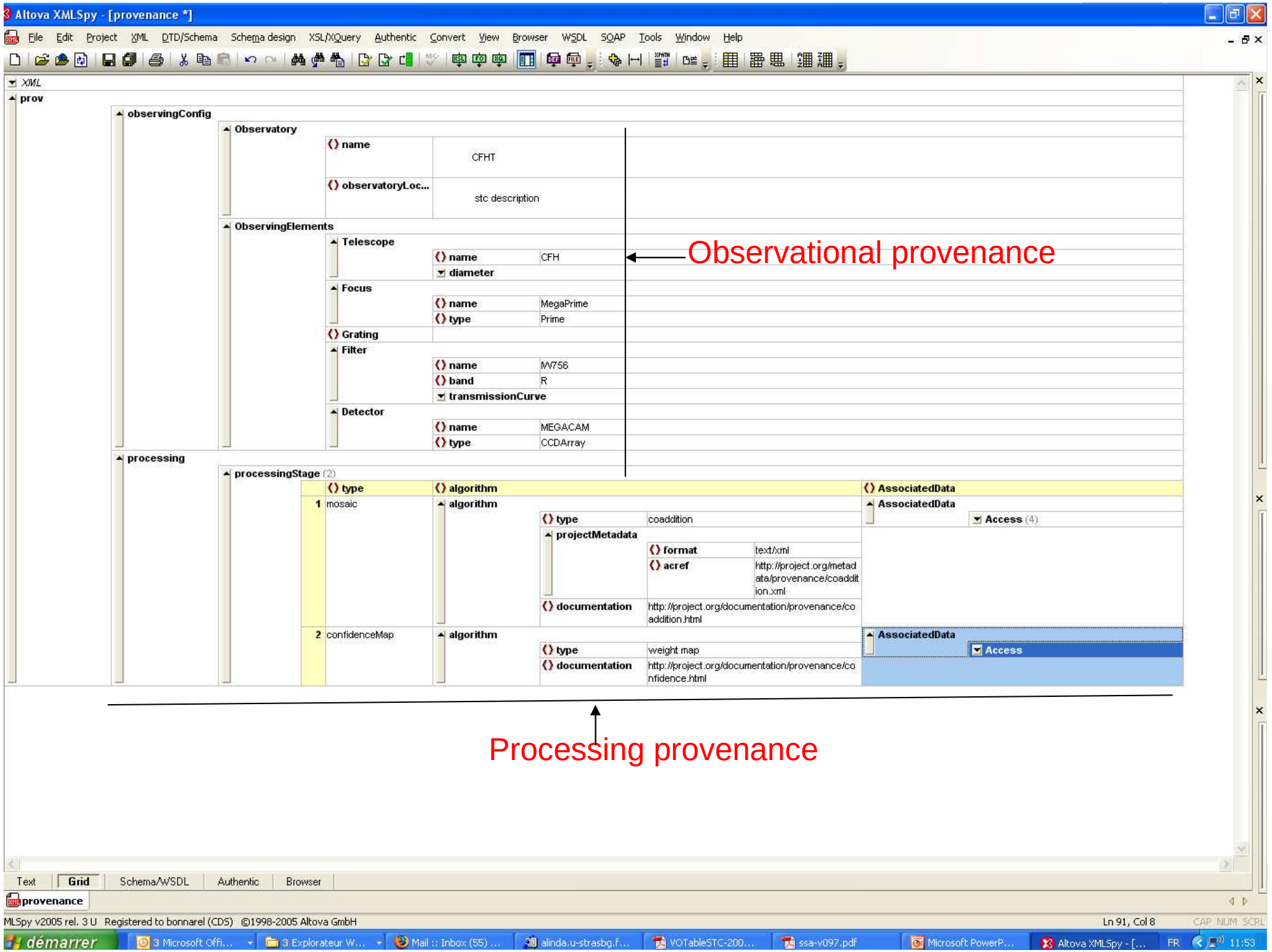
Observational provenance
Filter Transmission curve




Processing provenance


Altova XMLSpy - [provenance *]
File Edit Project XML DTD/Schema Schema design XSL/XQuery Authentic Convert View Browser WSDL SOAP Tools Window Help
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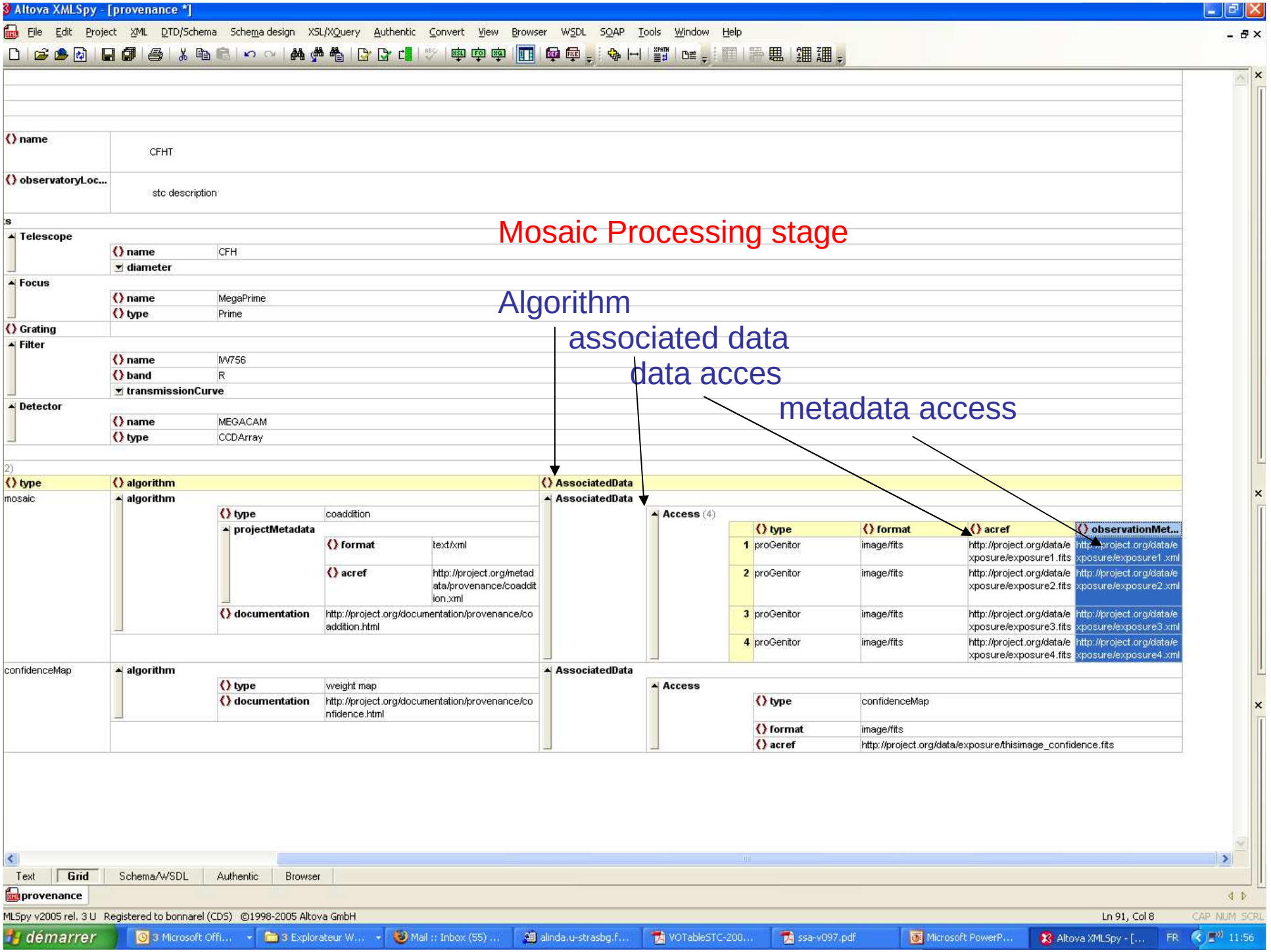
Altova XMLSpy - [provenance *]
File Edit Project XML DTD/Schema Schema design XSL/XQuery Authentic Convert View Browser WSDL SOAP Tools Window Help
name
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MegaPrime
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1 proGenitor image/fits http://project.org/data/exposure/exposure1.fits http://project.org/data/exposure/exposure1.xml
2 proGenitor image/fits http://project.org/data/exposure/exposure2.fits http://project.org/data/exposure/exposure2.xml
3 proGenitor image/fits http://project.org/data/exposure/exposure3.fits http://project.org/data/exposure/exposure3.xml
4 proGenitor image/fits http://project.org/data/exposure/exposure4.fits http://project.org/data/exposure/exposure4.xml
confidenceMap
algorithm
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weight map
documentation
http://project.org/documentation/provenance/confidence.html
AssociatedData
Access
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Text Grid Schema/WSDL Authentic Browser
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VOTableSTC-200...
ssa-v097.pdf
Microsoft PowerP...
Altova XMLSpy - [...
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# What to do next

- Post UML, schemata, utypes list, examples (acces to Igor service as well) on the IVOA site
- Discussion
- First Draft for early September