ESO/CDS instrument footprint facility
Use of VO Standards: SIA, STC and VOTABLE

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(May 15 2007)
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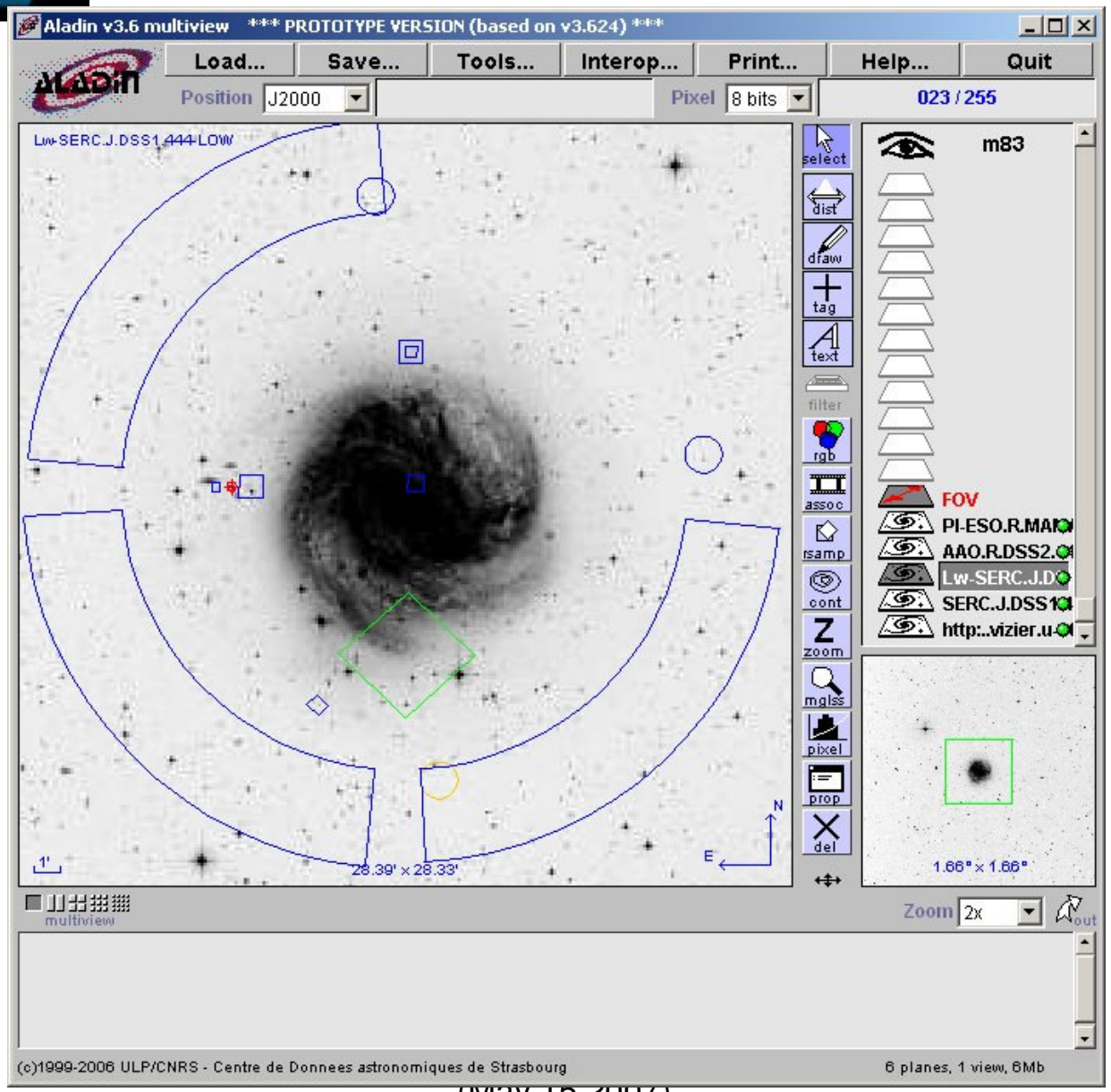
The ESO/CDS footprint facility

- Displaying footprint of observation and/or instruments on top of Previews in VO portals (eg Aladin, ESO Archive visual browser)
  - Preparation of observation (first version used by APT)
  - High level data discovery
- What is needed :
  - A format using VO standards (reusability, interoperability)
  - smart clients programs (Thanks Thomas, Fabien and Pierre)

Thomas Boch's demo



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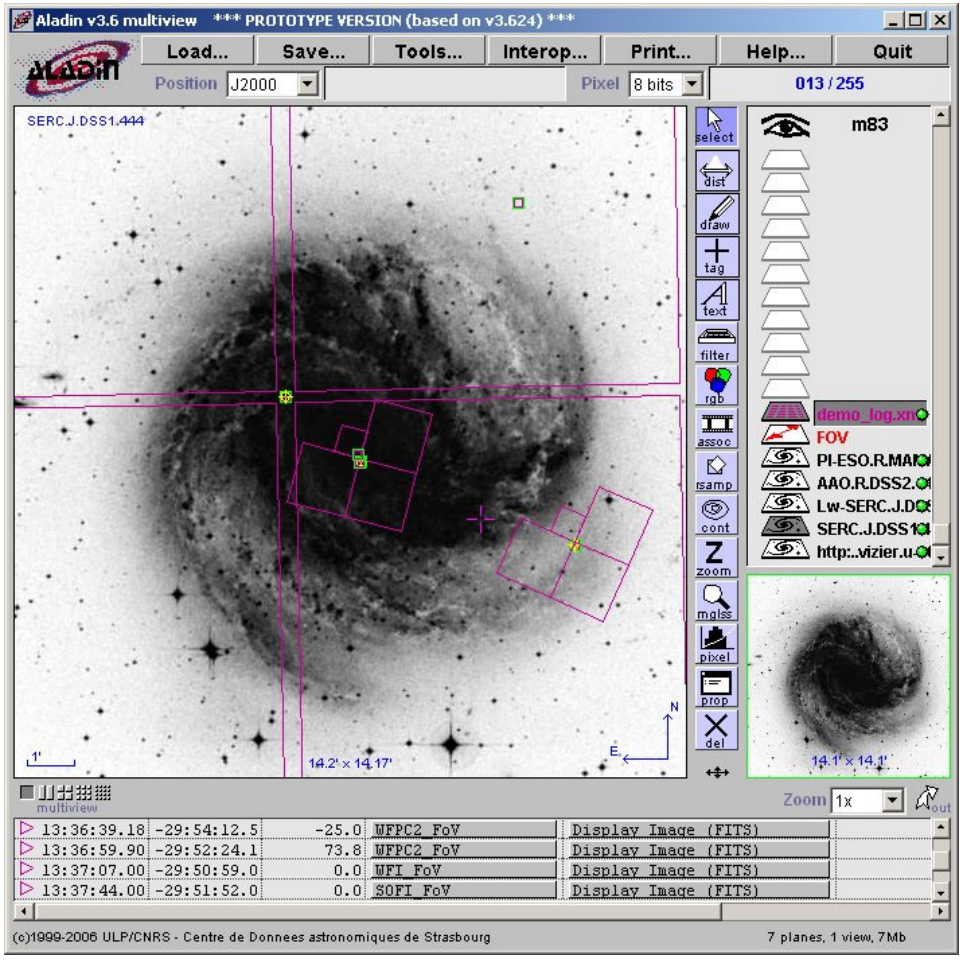
FOV attached to a dataset catalog



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How to describe FOV for VO clients

- 2 Vo choices for this prototype:
  - VOTABLE (for light parsing in Aladin and …)
  - Regions are described in compatibility with STC, by utypes.
- Two parts in the description:
  - Geometry (observation/instrument coverage.support)
  - Additional rendering information was developped
- Two parts in the geometry
  - The FOV instrumental plane (by a tangential plane custom coordinate system)
  - The Instruments / observation contours
- Adapted to independant descriptions or attached to Observation logs or SIA Query response (in Extensions) records

Description of the tangential plane A

- We will describe here an independant FOV , which is made of 2 boxes
- Initialization of the RESOURCE for the FOV description using a RESOURCE with the utype dal:fov

```
<RESOURCE ID="FakeInstrFoV" name ="Fake Instrument Field of View" utype="dal:footprint" >
  <DESCRIPTION>Ficticious FoV made up of a two identical rectangle"s separated by 5 arcsec. Each rectangle has dimensions 2' x 5'.
  </DESCRIPTION>
```

Description of the tangential plane B

- 1st step: Definition of the FOV plane, a CARTESIAN flavor for the Cordinate system (projected plane):

<!-- These five records define the Field of View Coordinate projection, flavor, Reference Frame Reference position and PA -->

<PARAM name="FOV Coord Frame" datatype="char" utype="stc:CoordF rame.Cart2DRefFrame. projection" value=«TAN »/>

<PARAM name="FOV Coord Flavor" datatype="char" utype="stc:CoordFrame.CoordFlavor.Type" value="CARTESIAN"/>

Description of the tangential plane C

```
<GROUP>
<PARAM utype=« stc:AstroCoords.coord-system_id » value=« ICRS-
    TOPO »/>
<PARAM name="RA" ucd="pos.eq.ra;meta.main"  datatype="char"
    arraysize= "11"  unit="h:m:s"
    utype="stc:CoordFrame.CoordRefPos.Position2D.Value2.C1«  valu
    e=«10 15 00  »/>
<PARAM name="DEC" ucd="pos.eq.dec;meta.main" datatype="char"
    arraysize="11" unit=""d:m:s""
    utype="stc:CoordFrame.CoordRefPos.Position2D.Value.C2 »
    value=«+60 03 02 » />
</GROUP>
<PARAM name="PA" ucd="pos.posAng" datatype="float" unit="deg"
    utype="stc:.CoordFrame.Cart2DRefFrame.PositionAngle"  />
```

Contour description A

- 2nd step : we will now describe the instrument contours:
- The following table describes the first Box in the FOV plane

```
<TABLE ID="fovT1" name="Field of View 1 part" >
```

- Here we define the REgion type as a box

```
<PARAM name="Region" value="Box"
utype="char:SpatialAxis.coverage.support.AreaType" />

   <!-- The AstroCoord sys definition allows to define a box with
sides parallel -->
 <!-- to the "tilted" axes of the system -->
```

Contour description B

- In the four params we define the X and Y offset and size of our rectangular box

```
<PARAM ID="CRO" name="CenterRAOffset" datatype="float" unit="arcsec"
       utype="stc:AstroCoordArea.Region. Box.Center.C1" value="-62.5"/>
<PARAM ID="CDO" name="CenterDecOffset" datatype="float"
unit="arcsec"
       utype="stc:AstroCoordArea.Region:Box.Center.C2" value="0.0" />
<PARAM ID="SizRA" name="SizeRA" datatype="float" unit="arcsec"
       utype="stc:AstroCoordArea.Region:Box.Size" value="120.0"/>
 <PARAM ID="SizDE" name="SizeDE" datatype="float" unit="arcsec"
       utype="stc:AstroCoordArea.Region:Box.Size" value="300.0"/>
</TABLE>
```

Contour description C

- The following lines define a second box in the same FOV

```
<TABLE ID="fovT2" name="Field of View 2 part">
 <PARAM name="Region" value="Box"
  utype="char:SpatialAxis.coverage.support.AreaType"/>
 <PARAM ID="CRO" name="CenterRAOffset" datatype="float" unit="arcsec"
        utype="stc:AstroCoordArea.Region.Box.Center.C1" value="62.5"/>
  <PARAM ID="CDO" name="CenterDecOffset" datatype="float"
  unit="arcsec"
        utype="stc:AstroCoordArea.Region.Box.Center.C2" value="0.0" />
  <PARAM ID="SizRA" name="SizeRA" datatype="float" unit="arcsec"
        utype="stc:AstroCoordArea.Region.:Box.Size" value="120.0"/>
  <PARAM ID="SizDE" name="SizeDE" datatype="float" unit="arcsec"
        utype="stc:AstroCoordArea.Region:Box.Size" value="300.0"/>
 </TABLE>
```

Rendering information

- We open a new RESOURCE with utype ”app:footprint.render”.
  <RESOURCE utype="app:footprint.render">
- Then We define a set of embedded rules applying to some parts of the geometry (footprint segments) by a hierarchy of nested RESOURCES.
- Here a rule to draw the first box in blue and write a yellow overlay string on top of the first box of our footprint.

```
<PARAM utype="app:footprint.render.filter.geom" ref="fovT1" value="*"/>
  <PARAM utype="app:footprint.render.color" datatype="char" arraysize="*"
    value="blue"/>
```

```
<RESOURCE utype="app:footprint.render.overlay.string">
    <PARAM utype="app:footprint.render.overlay.string.color"
    value="yellow" datatype="char“ arraysize="*"/>
   <PARAM utype="app:footprint.render.overlay.string.content"
    value="FORS1 Chip1" datatype="char" arraysize="*"/>
  <PARAM utype="stc:AstroCoord.Position2D.Value2.C1"
    value="500.00" datatype="float unit="arcsec"/>
  <PARAM utype="stc:AstroCoord.Position2D.Value2.C2"
    value="500.00" datatype="float " unit="arcsec"/>
  </RESOURCE>
</RESOURCE>
```

And:

- Polygons, Circular regions and Pickles can also be described
- IVOA note fast ready
- Will be Used for ESO Archive, Aladin server, APT and ESA ST-ECF.

Acknowledgments

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