ESAC(VILSPA) proposals for extension of DAL functionality

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Presentation Overview

ESAC proposal for Spectral access using modified SIAP

Use of ISO Spectra and XMM-Newton Energy Bands at AVO demo

The need of structure in SIAP

ESAC proposal for structured SIAP

Conclusions

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ESAC proposal for Spectral access using modified SIAP

- **IVOA Workshop 2003: we propose to include Spectral Access using the current SIAP with slight modification**

- **We implemented such access for ISO spectra with following few extra FIELDS:**

```
FIELD_ID="AXES"    ucd=VOX:Spectrum_axes    [...]
FIELD ID="UNITS"   ucd=VOX:Spectrum_units   [...]
FIELD ID="FORMAT"  ucd=VOX:Spectrum_Format  [...]
FIELD ID="DIMEQ"   ucd=VOX:Spectrum_dimeq   [...]
FIELD ID="SCALEQ"  ucd=VOX:Spectrum_scaleq  [...]
```


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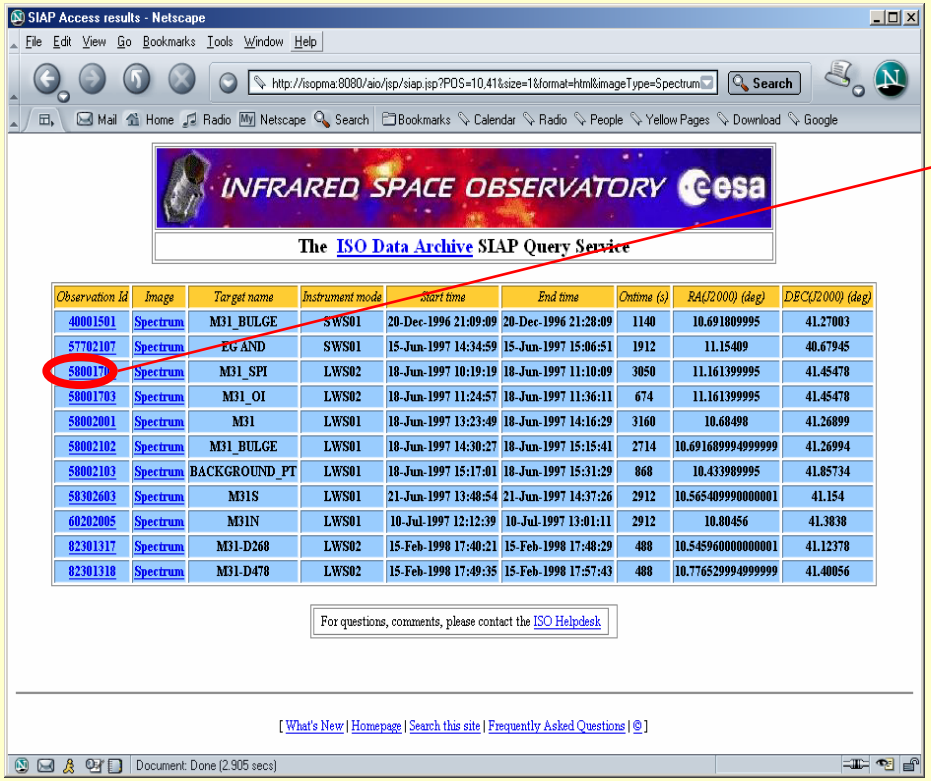
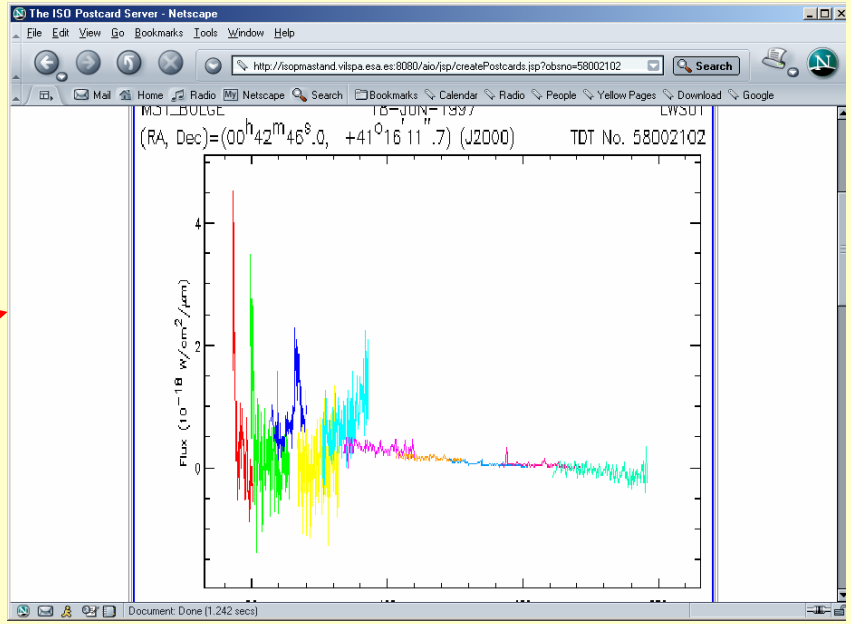
Example of ISO Spectrum access

http://isopma:8080/aio/jsp/siap.jsp?POS=10,41&size=1&format=html&imageType=Spectrum



Observation Id	Image	Target name	Instrument mode	Start time	End time	Ontime (s)	RA(J2000) (deg)	DEC(J2000) (deg)
40001501	Spectrum	M31_BULGE	SWS01	20-Dec-1996 21:09:09	20-Dec-1996 21:28:09	1140	10.691809995	41.27003
57702107	Spectrum	EG AND	SWS01	15-Jun-1997 14:34:59	15-Jun-1997 15:06:51	1912	11.15409	40.67945
58001701	Spectrum	M31_SPI	LWS02	18-Jun-1997 10:19:19	18-Jun-1997 11:10:09	3050	11.161399995	41.45478
58001703	Spectrum	M31_OI	LWS02	18-Jun-1997 11:24:57	18-Jun-1997 11:36:11	674	11.161399995	41.45478
58002001	Spectrum	M31	LWS01	18-Jun-1997 13:23:49	18-Jun-1997 14:16:29	3160	10.68498	41.26899
58002102	Spectrum	M31_BULGE	LWS01	18-Jun-1997 14:30:27	18-Jun-1997 15:15:41	2714	10.691689994999999	41.26994
58002103	Spectrum	BACKGROUND_PT	LWS01	18-Jun-1997 15:17:01	18-Jun-1997 15:31:29	868	10.433989995	41.85734
58302603	Spectrum	M31S	LWS01	21-Jun-1997 13:48:54	21-Jun-1997 14:37:26	2912	10.565409990000001	41.154
60202005	Spectrum	M31N	LWS01	10-Jul-1997 12:12:39	10-Jul-1997 13:01:11	2912	10.80456	41.3838
82301317	Spectrum	M31-D268	LWS02	15-Feb-1998 17:40:21	15-Feb-1998 17:48:29	488	10.545960000000001	41.12378
82301318	Spectrum	M31-D478	LWS02	15-Feb-1998 17:49:35	15-Feb-1998 17:57:43	488	10.776529994999999	41.40056



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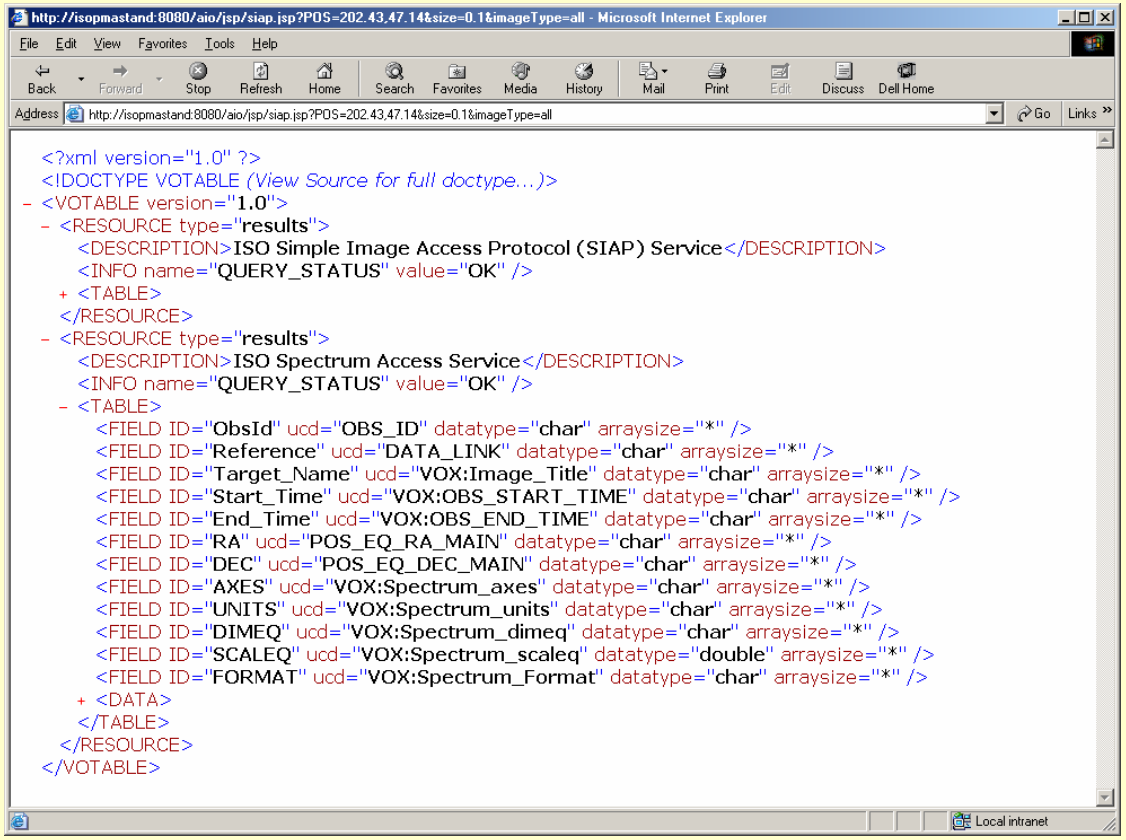
VOTable Result …

Both IMAGES and SPECTRA in same request With different RESOURCES



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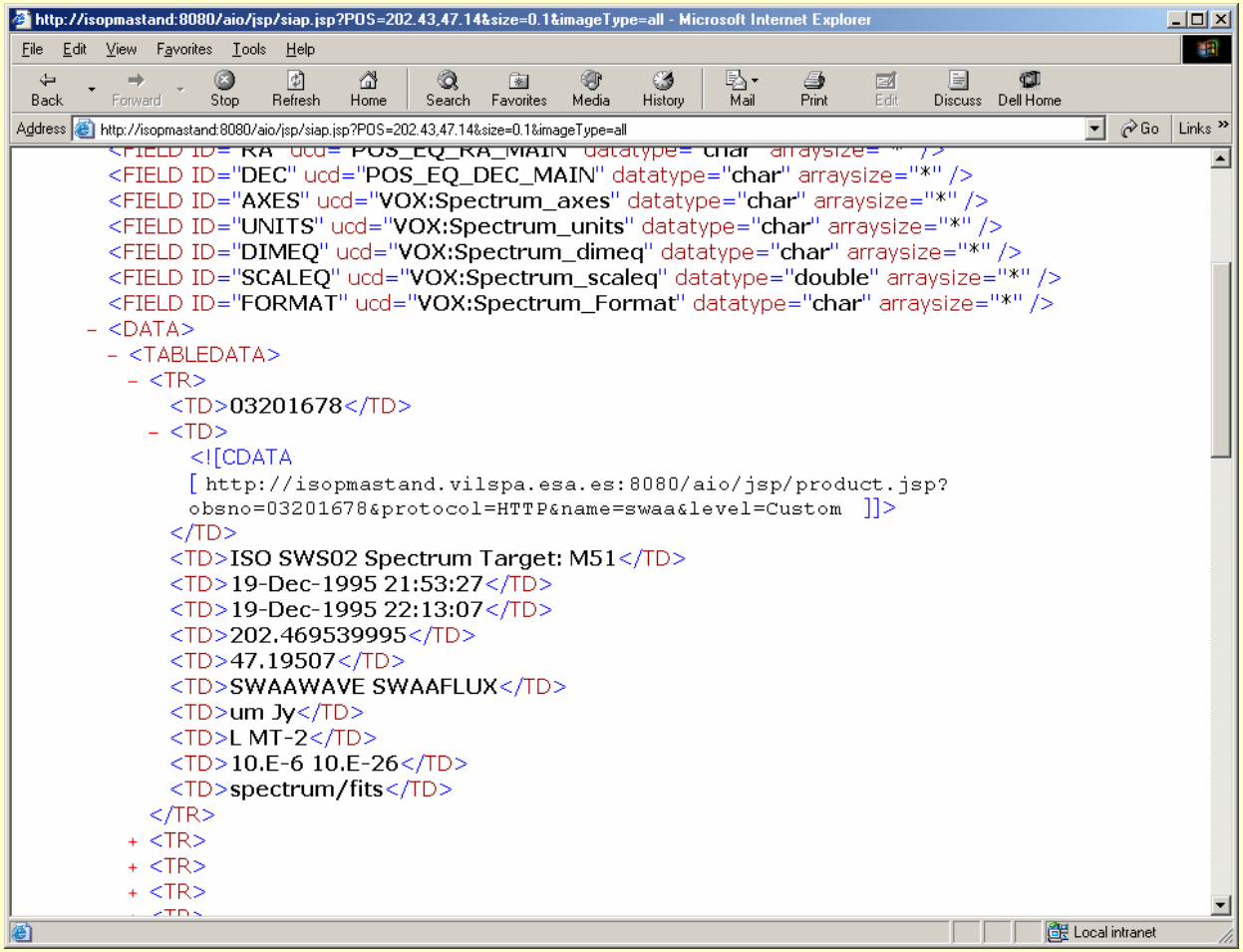
VOTable Result (cont.)



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SUPERIMPOSING Spectra …

```
FIELD ID="UNITS"   ucd=VOX:Spectrum_units   […]
FIELD ID="DIMEQ"   ucd=VOX:Spectrum_dimeq   […]
FIELD ID="SCALEQ"  ucd=VOX:Spectrum_scaleq  […]
```

<TD>**40001501**</TD> -
<TD>- <![CDATA[http://[…]swaa]]></TD>
<TD>**ISO SWS01 Spectrum Target: M31_BULGE**</TD>
<TD>**20-Dec-1996 21:09:09**</TD>
<TD>**20-Dec-1996 21:28:09**</TD>
<TD>**10.691809995**</TD>
<TD>**41.27003**</TD>
<TD>**SWAAWAVE SWAAFLUX**</TD>
<TD>**um Jy**</TD>
<TD>**L MT-2**</TD>
<TD>**10.E-6 10.E-26**</TD>
<TD>**spectrum/fits**</TD>

DIMEQ= **MT-2**

<TD>**58001701**</TD> -
<TD>- <![CDATA[http://[…]lsan]]></TD>
<TD>**ISO LWS02 Spectrum Target: M31_BULGE**</TD>
<TD>**18-Jun-1997 10:19:19**</TD>
<TD>**18-Jun-1997 11:10:09**</TD>
<TD> **10.691809995** </TD>
<TD> **41.27003** </TD>
<TD>**LSANWAV LSANFLX**</TD>
<TD>**microns watts/cm^2/micron**</TD>
<TD>**L ML-1T-3**</TD>
<TD>**10.E-6 10.E+10**</TD>
<TD>**spectrum/fits**</TD>

DIMEQ= **ML-1T-3**

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… using Dimensional Equation

$$\frac{[SWS]}{[LWS]} = \frac{MT-2}{ML-1T-3} = LT$$

$$LT = \lambda^{n} c^{m} = (L^{n} T^{-1})^{m} = L^{n+m} T^{-m}$$

$$\Rightarrow \begin{Bmatrix} n+m=1 \\ -m=1 \end{Bmatrix} \Rightarrow \begin{Bmatrix} m=-1 \\ n=2 \end{Bmatrix}$$

$\Rightarrow$ to go from SWS to LWS we multiply by :

$$\frac{\lambda^{2}}{c}$$

$$\Phi(\text{SWS units}) = \Phi(\text{LWS units}) \frac{\lambda^{2}}{c} \frac{\text{SWS scale}}{\text{LWS scale}}$$

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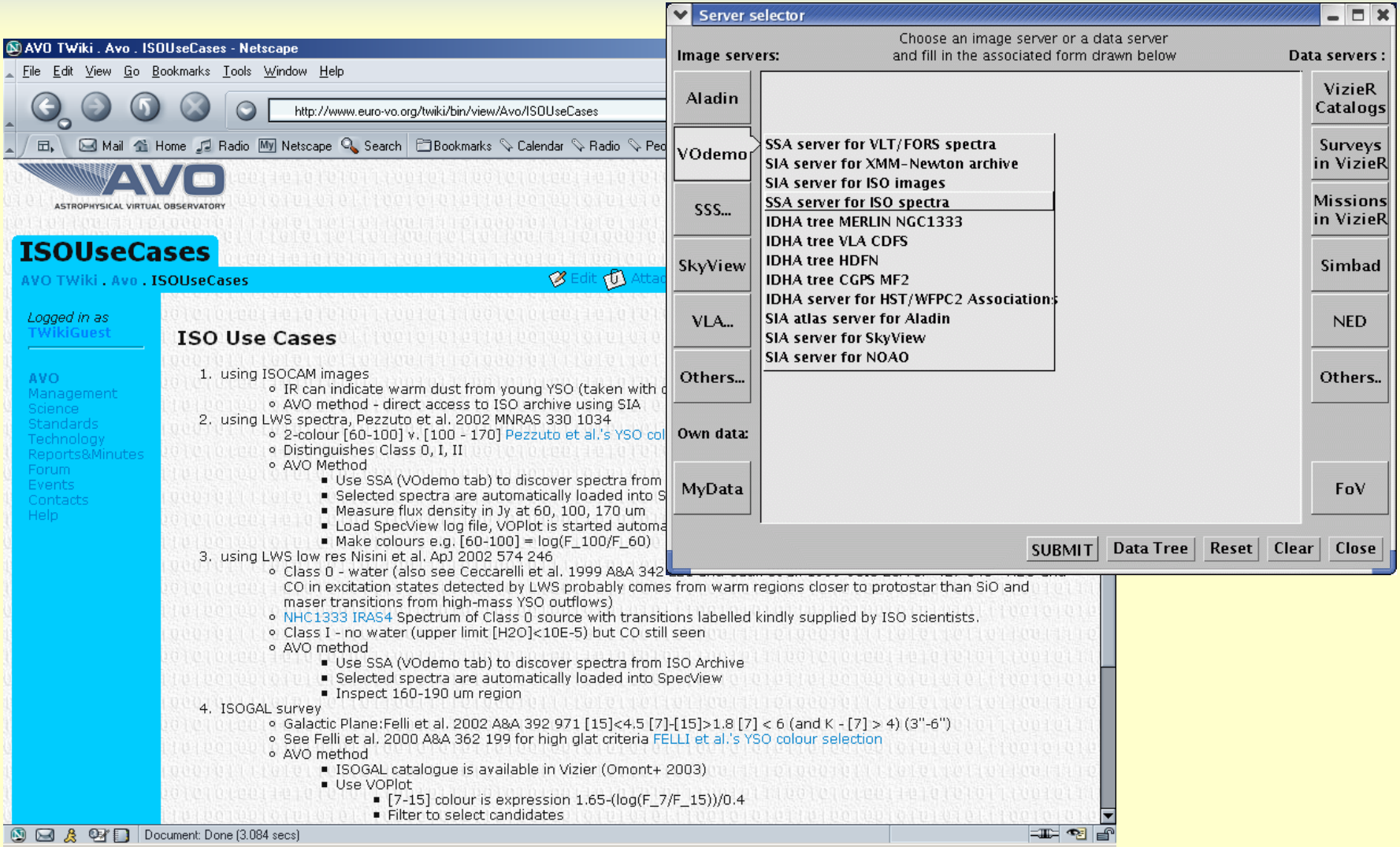
ISO Spectra were used at the AVO Demo…



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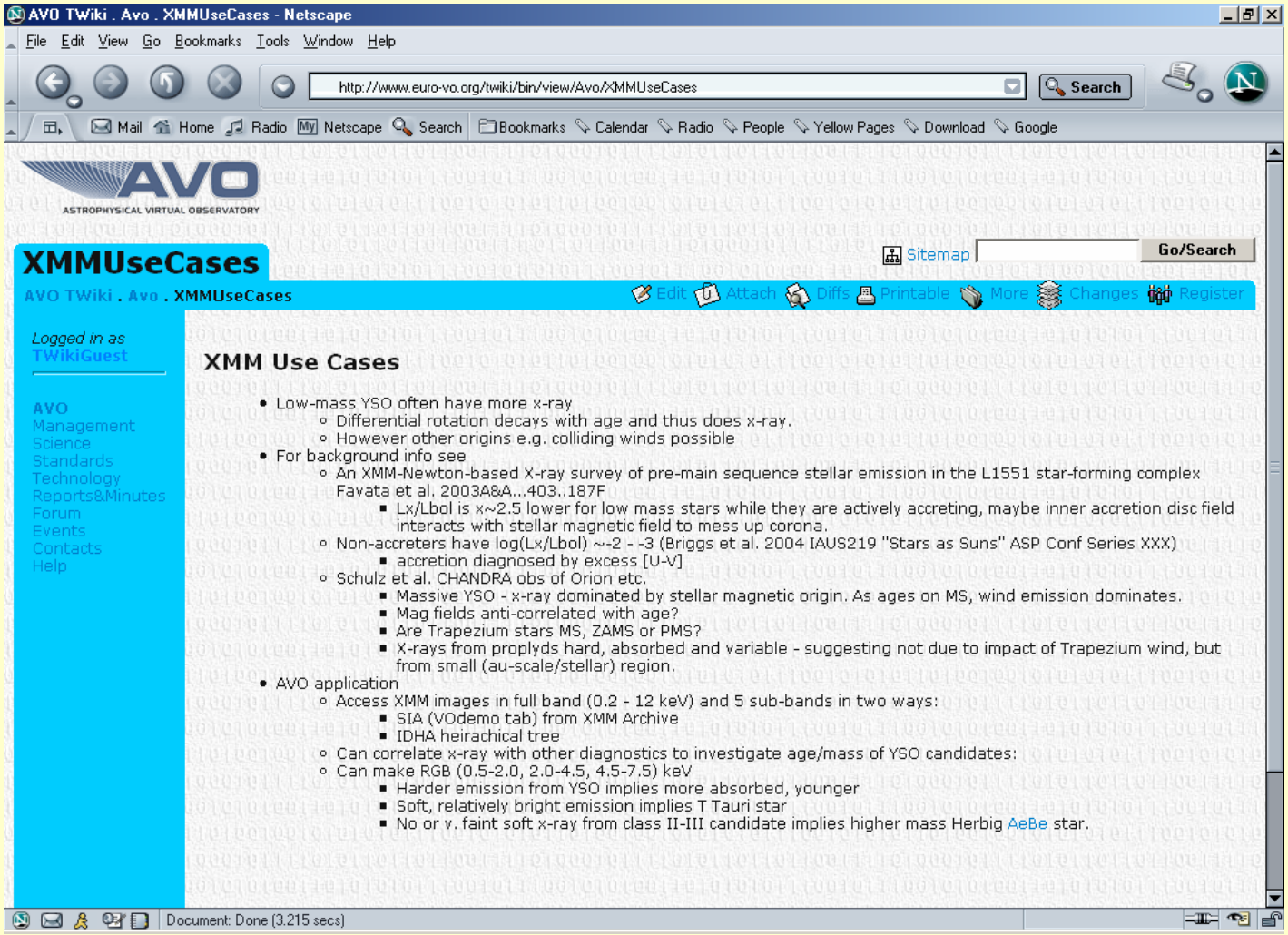
… and so where XMM-Newton images per Energy Band



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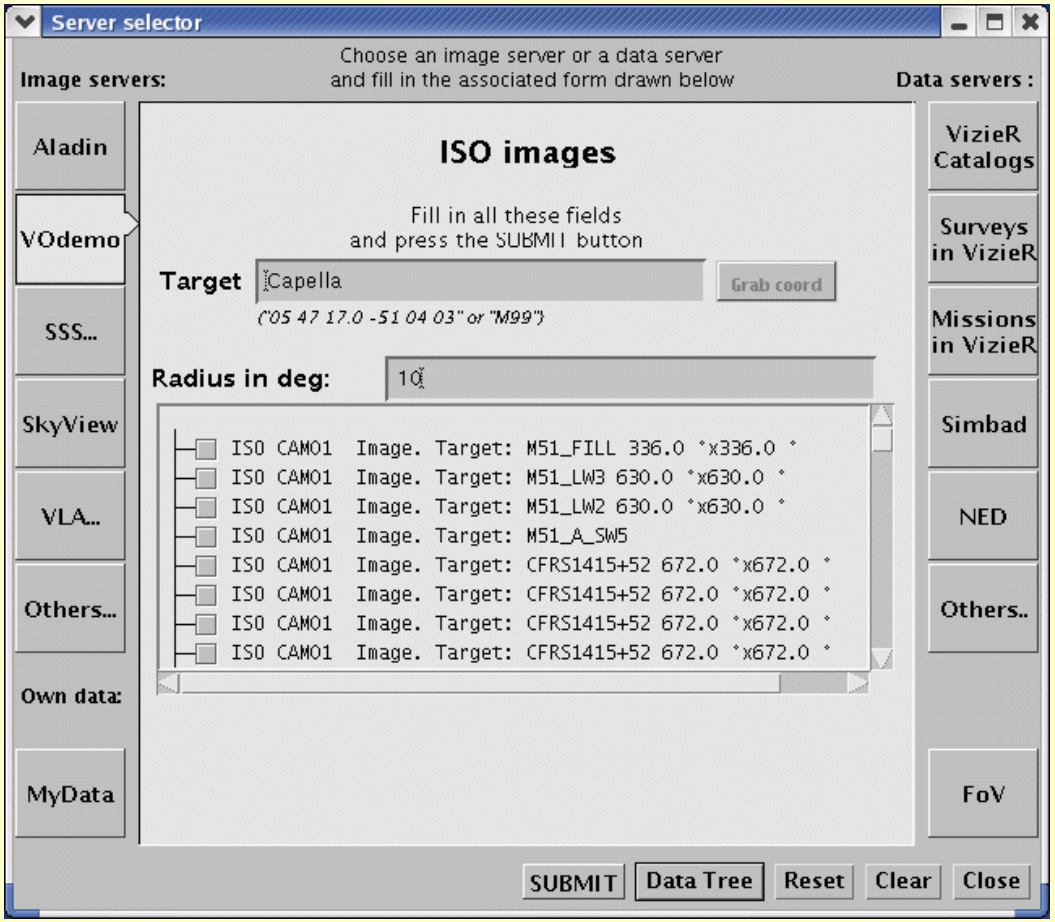
The need of Structure in SIAP

Current: No Structure



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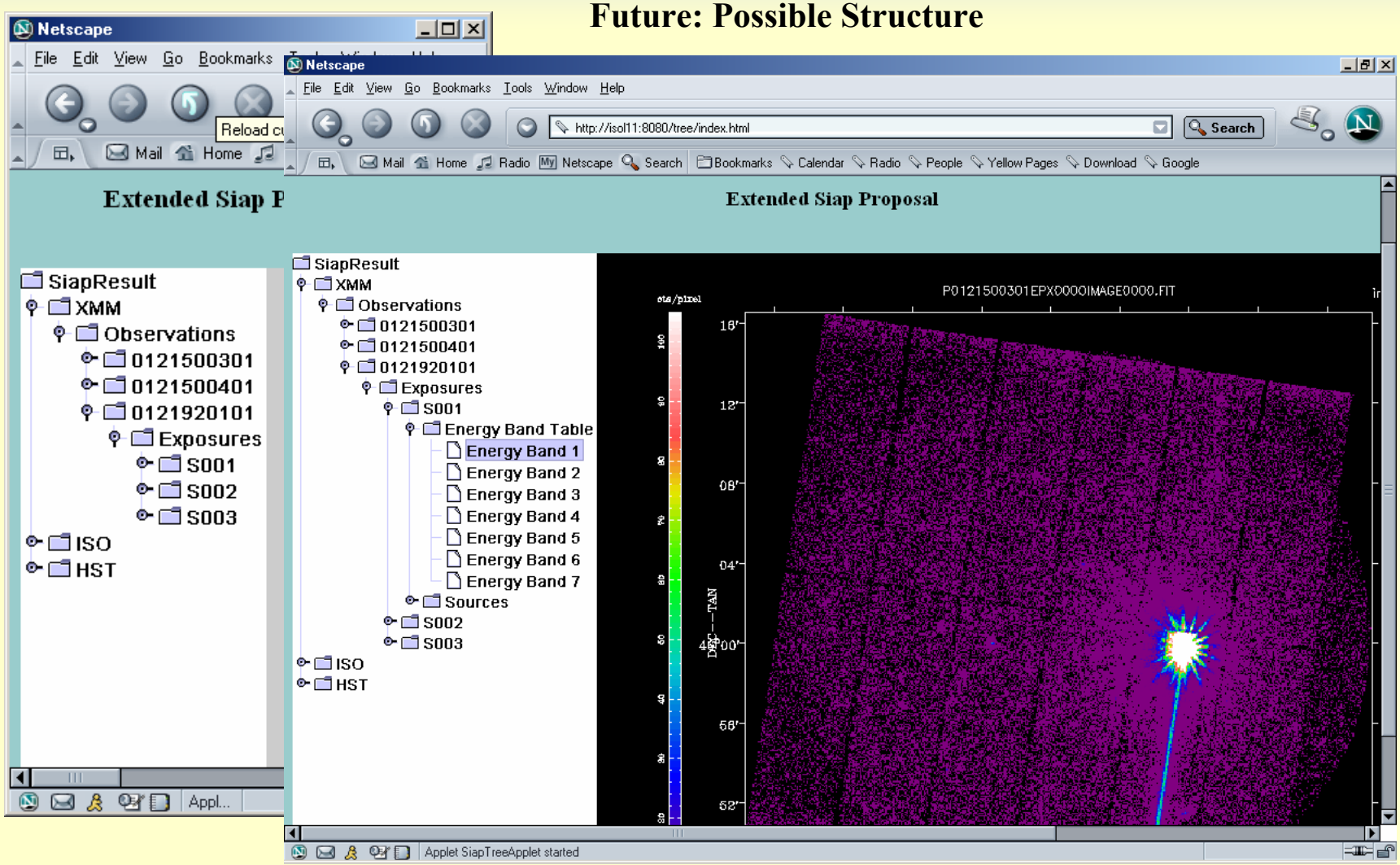
The need of Structure in SIAP(II)

Future: Possible Structure



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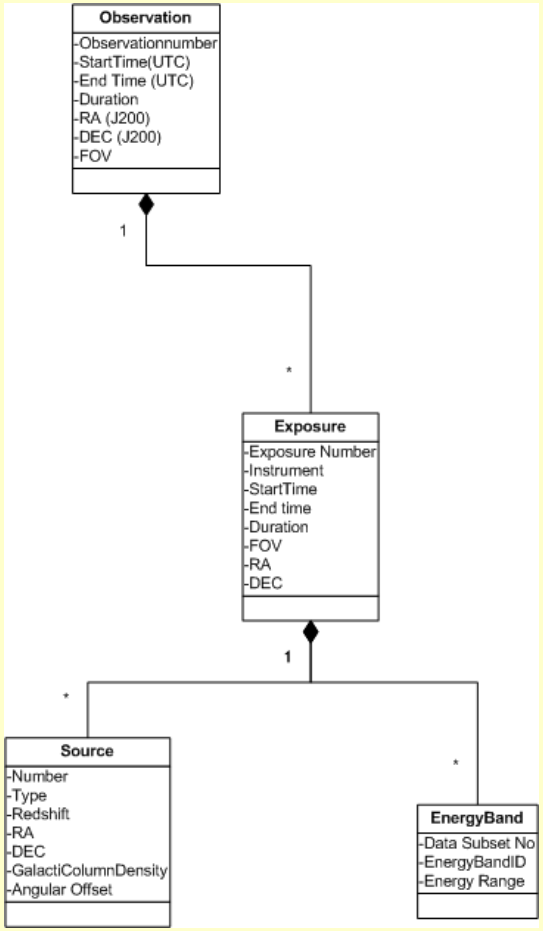
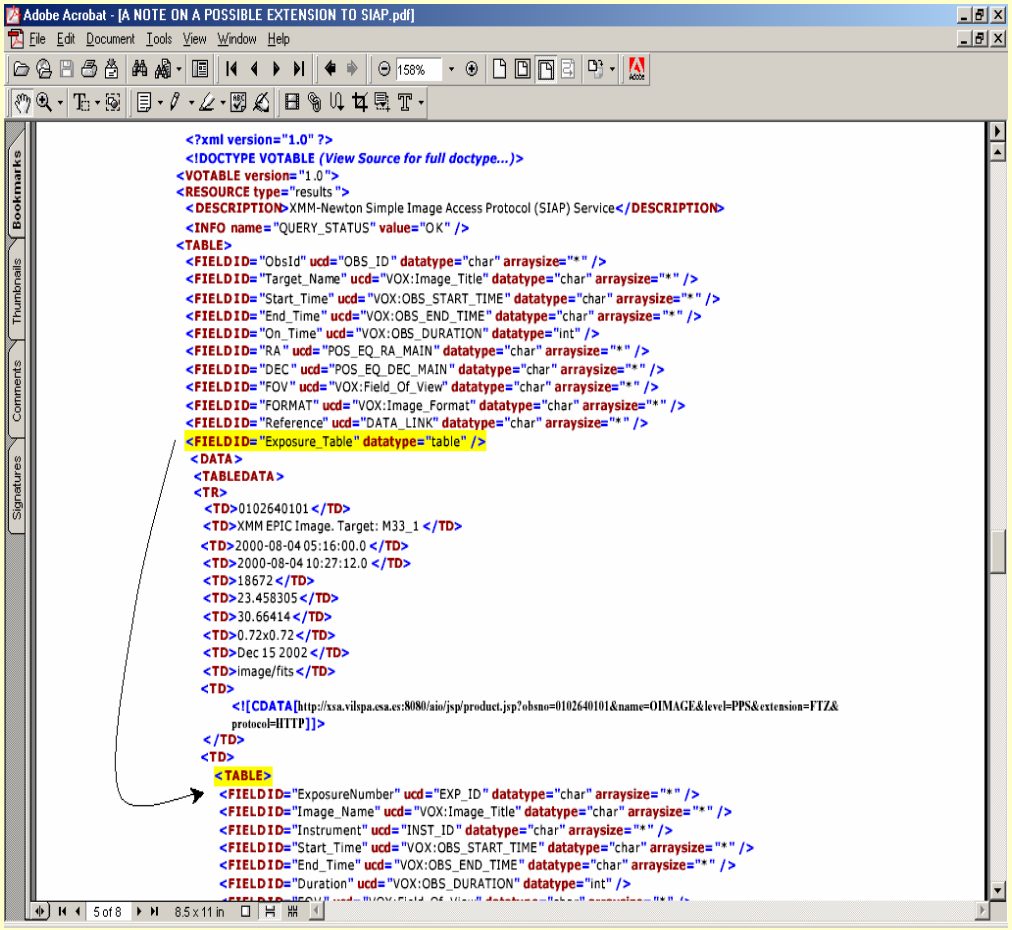
ESAC Proposal for structured SIAP

IF agreed to use VOTable: allow tables inside tables





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Conclusion

- **Adaptation of SIAP to include Spectra is very easy and provides a lot of functionality to the VO.**

- **We believe some structure within SIAP is needed, both for Images and Spectra.**

- **In case we want to use VOTables, map the UML Data Model diagrams of your system to VOTable, modified to allow tables inside tables.**

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