EPN-TAP services: Spectroscopy

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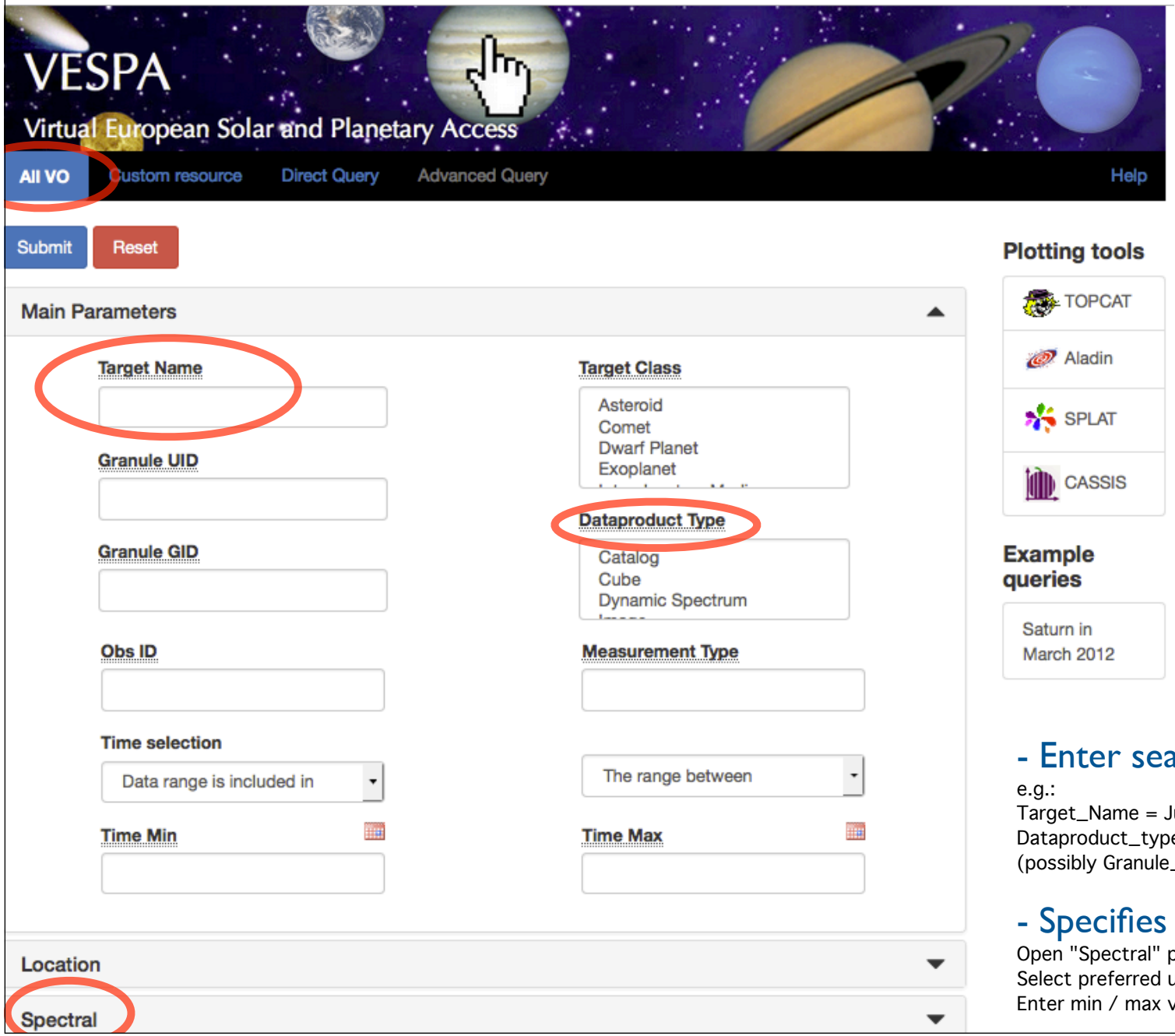
v1.0, 18/3/2017

Go to VESPA web site

http://vespa.obspm.fr



- Check "All VO" to access public data services

- Enter search parameters:

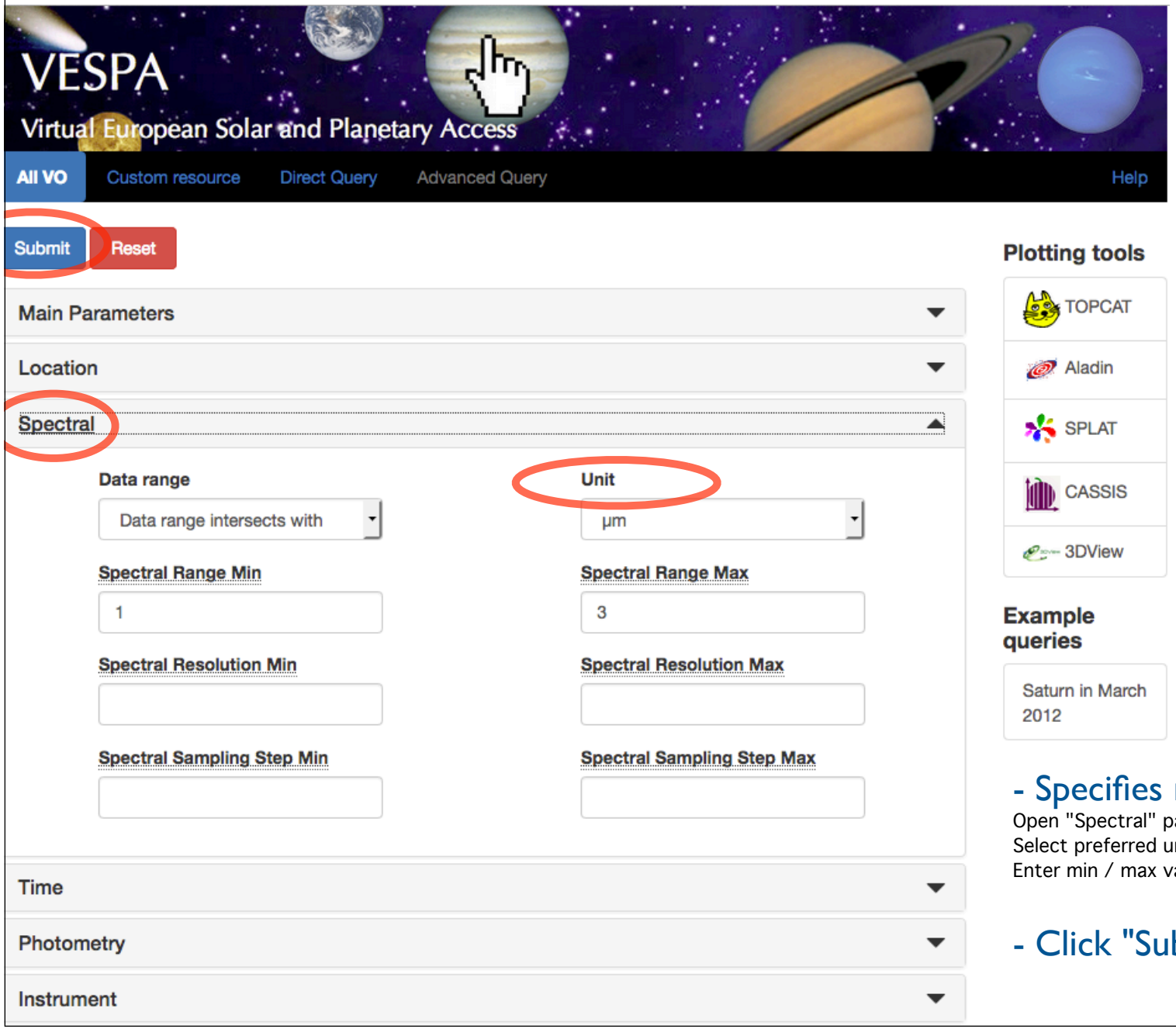
e.g.:
Target_Name = Jupiter or Ceres or Lutetia
Dataproduct_type = spectrum
(possibly Granule_ID = "formatted" to get only VOTables

- Specifies ranges

Open "Spectral" panel
Select preferred unit (frequency or wavelength)
Enter min / max values

Go to VESPA web site

http://vespa.obspm.fr



- Check "All VO" to access public data services

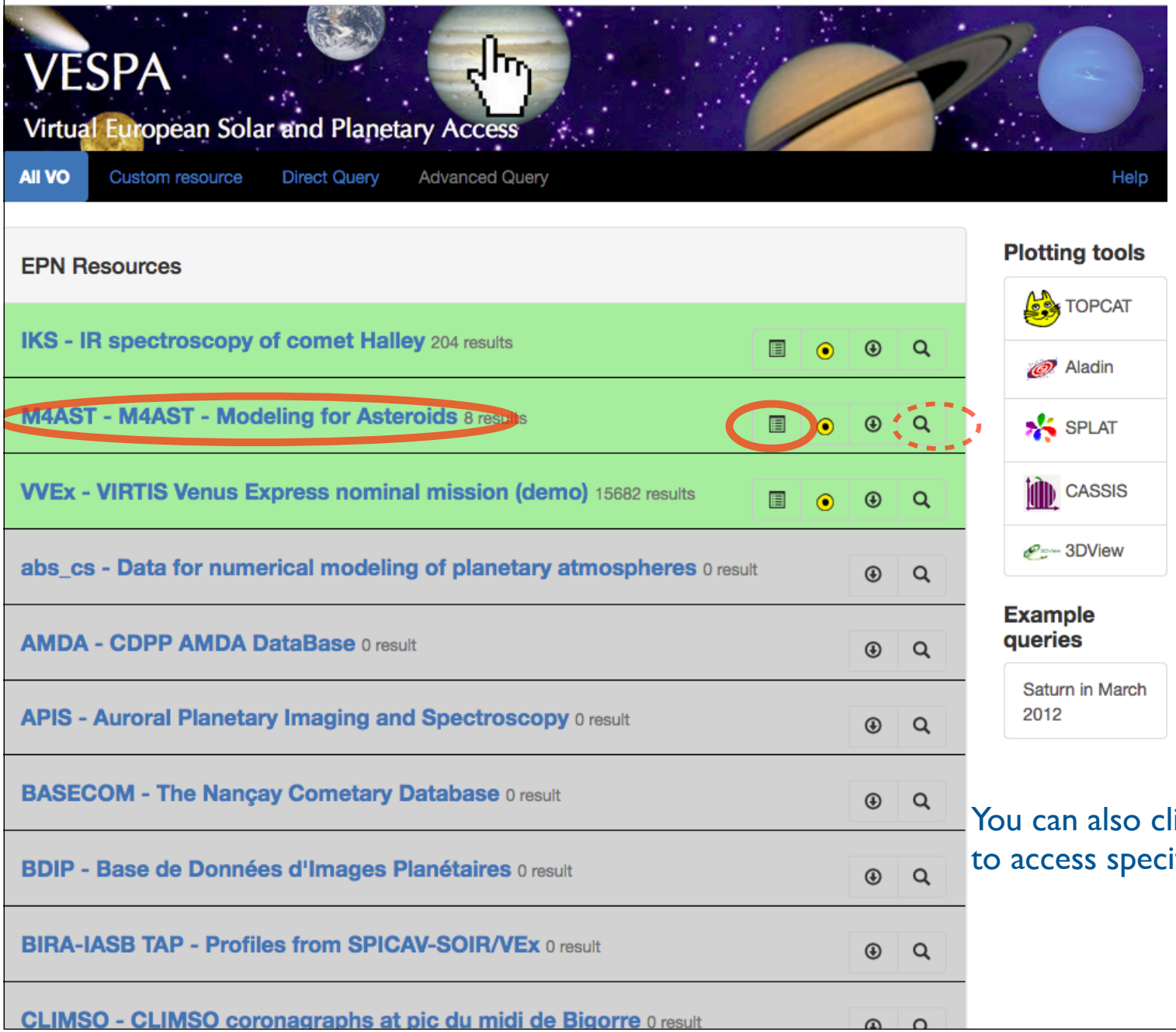
- Specifies ranges

Open "Spectral" panel
Select preferred unit (frequency or wavelength)
Enter min / max values & type of coverage

- Click "Submit" when ready

Service results

http://vespa.obspm.fr



- In line M4ast, click the "Display results" icon to get result list

You can also click "Advanced query form" to access specific parameters (local time…)

Query results

Result is a list of files matching the query

Results in service M4AST

how 10 entries

Column visibility | Show all | Hide all

Select All in current page | Reset Selection

granule_uid	dataproduct_type	target_name	time_min (d)	time_max (d)	access_url	granule_gid	obs_id
Zeissia_19920114_697_00_nativ	spectrum	Zeissia	1992-01-14T00:00:00.000	1992-01-14T00:00:00.000	http://cardamine.imc...	native	Zeissia_19920114_697_00_obs
Zeissia_19920114_697_00	spectrum	Zeissia	1992-01-14T00:00:00.000	1992-01-14T00:00:00.000	http://voparis-srv-p...	formatted	Zeissia_19920114_697_00_obs
Zao_20001026_262_00_nativ	spectrum	Zao	2000-10-26T00:00:00.000	2000-10-26T00:00:00.000	http://cardamine.imc...	native	Zao_20001026_262_00_obs
Zao_20001026_262_00	spectrum	Zao	2000-10-26T00:00:00.000	2000-10-26T00:00:00.000	http://voparis-srv-p...	formatted	Zao_20001026_262_00_obs
Wesson_19911028_697_00_nativ	spectrum	Wesson	1991-10-28T00:00:00.000	1991-10-28T00:00:00.000	http://cardamine.imc...	native	Wesson_19911028_697_00_obs
Wesson_19911028_697_00	spectrum	Wesson	1991-10-28T00:00:00.000	1991-10-28T00:00:00.000	http://voparis-srv-p...	formatted	Wesson_19911028_697_00_obs
Viv_19911028_697_00_nativ	spectrum	Viv	1991-10-28T00:00:00.000	1991-10-28T00:00:00.000	http://cardamine.imc...	native	Viv_19911028_697_00_obs
Viv_19911028_697_00	spectrum	Viv	1991-10-28T00:00:00.000	1991-10-28T00:00:00.000	http://voparis-srv-p...	formatted	Viv_19911028_697_00_obs
Vihuri_19911213_697_00_nativ	spectrum	Vihuri	1991-12-13T00:00:00.000	1991-12-13T00:00:00.000	http://cardamine.imc...	native	Vihuri_19911213_697_00_obs
Vihuri_19911213_697_00	spectrum	Vihuri	1991-12-13T00:00:00.000	1991-12-13T00:00:00.000	http://voparis-srv-p...	formatted	Vihuri_19911213_697_00_obs

howing 1 to 10 of 940 entries 1 row selected

Data Selection | Metadata Selection | All Data | All Metadata | Footprints

Plotting tools

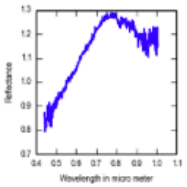
TOPCAT
Aladin
SPLAT
CASSIS
3DView

Example queries

Saturn in March 2012

- Click "Show all" to see other parameters

- Hover the mouse over the table to see thumbnails



- Click link in"access_url" column to see one file
- Click to select one or more lines & click "Data selection" / Download to retrieve the files

Analysing results

Launch VO tools either from buttons or from your system

Results in service M4AST

how 10 entries

Column visibility | Show all | Hide all

Select All in current page | Reset Selection

granule_uid	dataproduct_type	target_name	time_min (d)	time_max (d)	access_url	granule_gid	obs_id
Zeissia_19920114_697_00_nativ	spectrum	Zeissia	1992-01-14T00:00:00.000	1992-01-14T00:00:00.000	http://cardamine.imc...	native	Zeissia_19920114_697_00_obs
Zeissia_19920114_697_00	spectrum	Zeissia	1992-01-14T00:00:00.000	1992-01-14T00:00:00.000	http://voparis-srv-p...	formatted	Zeissia_19920114_697_00_obs
Zao_20001026_262_00_nativ	spectrum	Zao	2000-10-26T00:00:00.000	2000-10-26T00:00:00.000	http://cardamine.imc...	native	Zao_20001026_262_00_obs
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Wesson_19911028_697_00	spectrum	Wesson	1991-10-28T00:00:00.000	1991-10-28T00:00:00.000	http://voparis-srv-p...	formatted	Wesson_19911028_697_00_obs
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Viv_19911028_697_00	spectrum	Viv	1991-10-28T00:00:00.000	1991-10-28T00:00:00.000	http://voparis-srv-p...	formatted	Viv_19911028_697_00_obs
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Vihuri_19911213_697_00	spectrum	Vihuri	1991-12-13T00:00:00.000	1991-12-13T00:00:00.000	http://voparis-srv-p...	formatted	V

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Data Selection | Metadata Selection | All Data | All Metadata

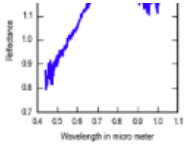
Plotting tools

- TOPCAT
- Aladin
- SPLAT
- CASSIS
- 3DView

Example queries

Saturn in March 2012

Favorite tools include:
Aladin & DS9: images & cubes
TOPCAT: tables & catalogues
CASSIS & SPLAT/Specview/VOspec: spectra



Query results

Result is a list of files matching the query

Results in service M4AST

how 10 entries

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Zeissia_19920114_697_00	spectrum	Zeissia	1992-01-14T00:00:00.000	1992-01-14T00:00:00.000	http://voparis-srv-p...	formatted	Zeissia_19920114_697_00_obs
Zao_20001026_262_00_nativ	spectrum	Zao	2000-10-26T00:00:00.000	2000-10-26T00:00:00.000	http://cardamine.imc...	native	Zao_20001026_262_00_obs
Zao_20001026_262_00	spectrum	Zao	2000-10-26T00:00:00.000	2000-10-26T00:00:00.000	http://voparis-srv-p...	formatted	Zao_20001026_262_00_obs
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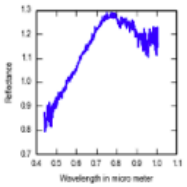
Plotting tools

TOPCAT
Aladin
SPLAT
CASSIS
3DView

Example queries

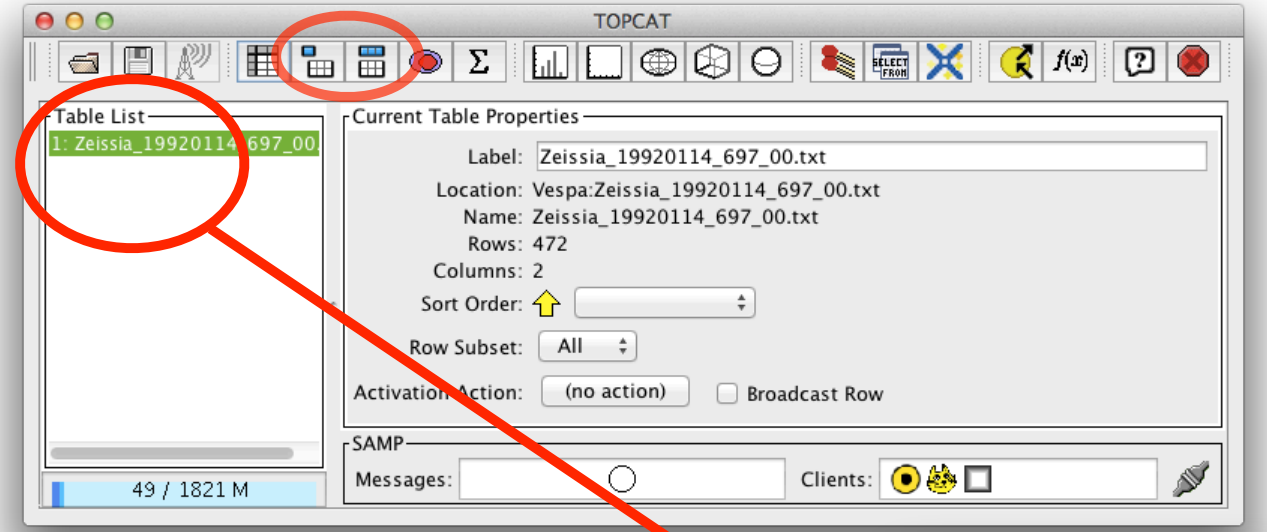
Saturn in March 2012

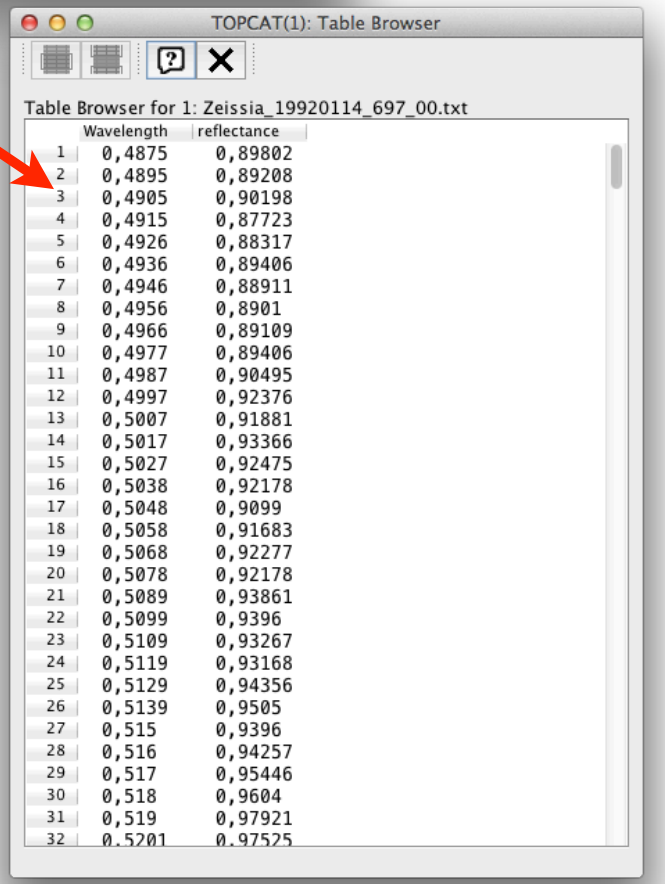
- Hover the mouse over the table to see thumbnails



- Click to select one or more lines & click "Data selection" / Send spectra to load data into CASSIS or VOspec, or / Send Table to load in TOPCAT
[- or click "All metadata" / Send table to send complete table to TOPCAT]

Visualizing data



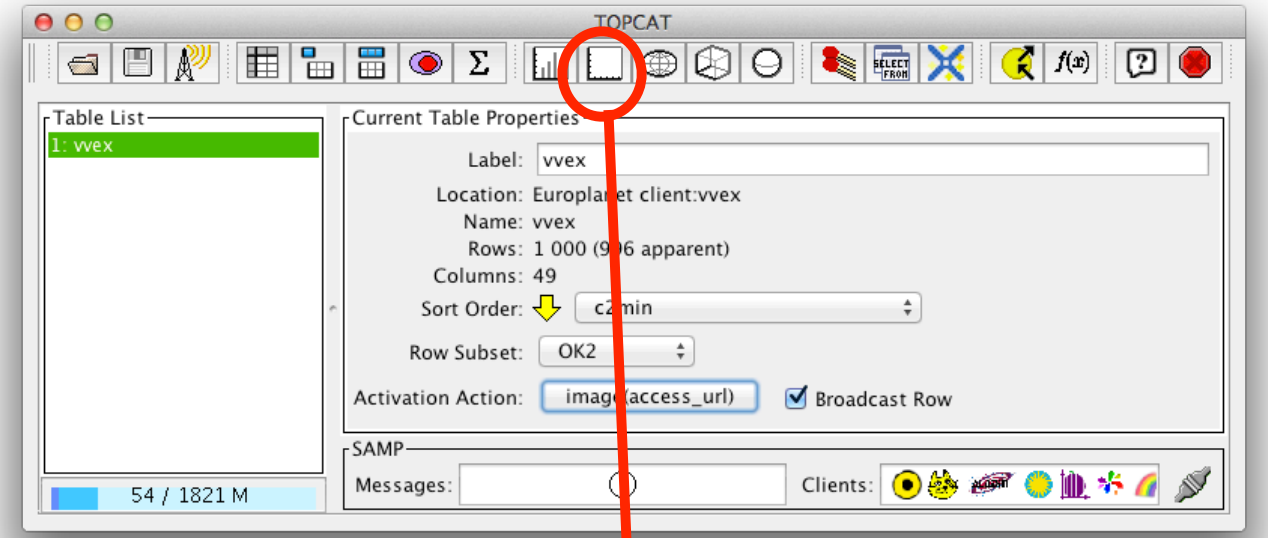


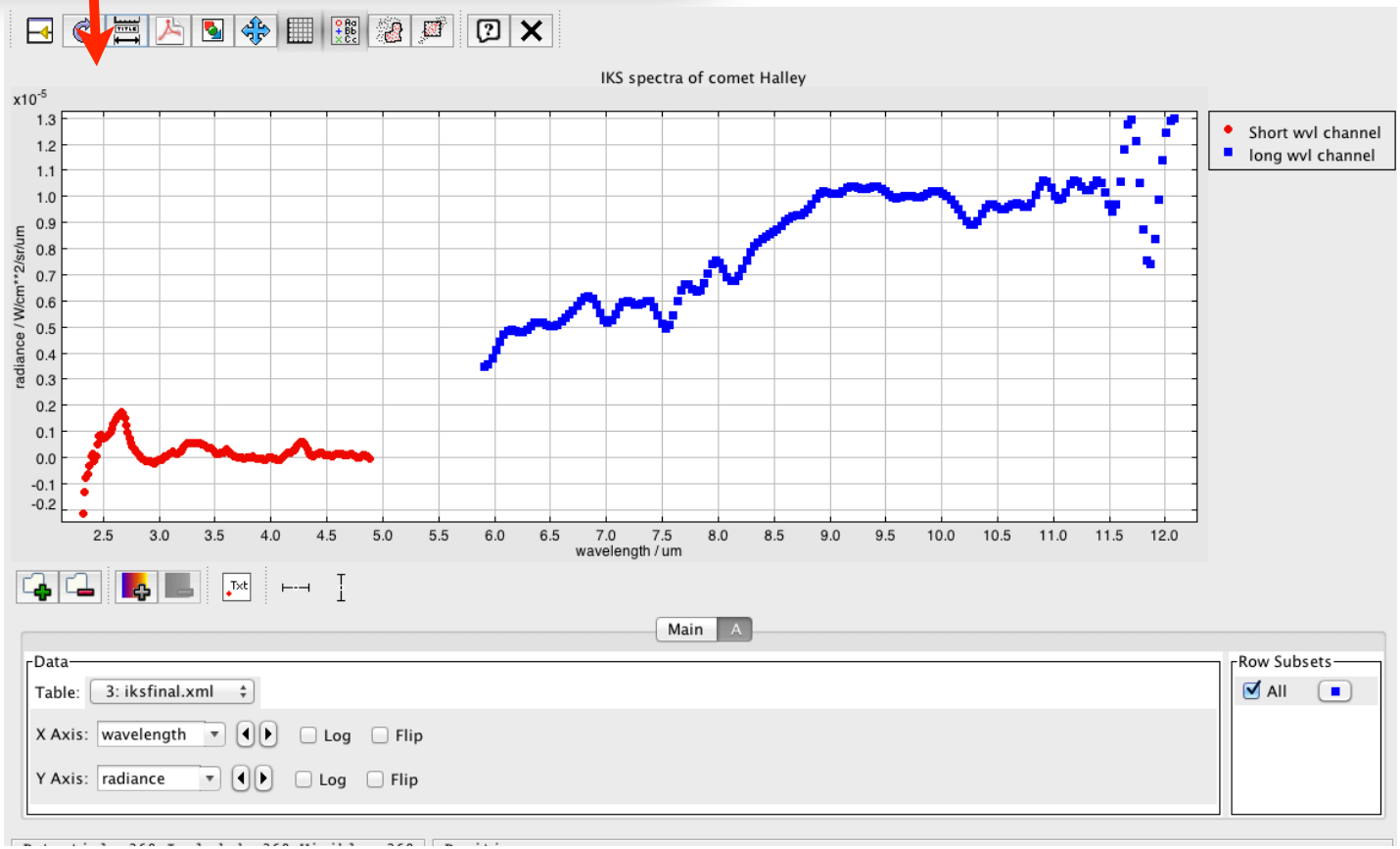
	Wavelength	reflectance
1	0,4875	0,89802
2	0,4895	0,89208
3	0,4905	0,90198
4	0,4915	0,87723
5	0,4926	0,88317
6	0,4936	0,89406
7	0,4946	0,88911
8	0,4956	0,8901
9	0,4966	0,89109
10	0,4977	0,89406
11	0,4987	0,90495
12	0,4997	0,92376
13	0,5007	0,91881
14	0,5017	0,93366
15	0,5027	0,92475
16	0,5038	0,92178
17	0,5048	0,9099
18	0,5058	0,91683
19	0,5068	0,92277
20	0,5078	0,92178
21	0,5089	0,93861
22	0,5099	0,9396
23	0,5109	0,93267
24	0,5119	0,93168
25	0,5129	0,94356
26	0,5139	0,9505
27	0,515	0,9396
28	0,516	0,94257
29	0,517	0,95446
30	0,518	0,9604
31	0,519	0,97921
32	0,5201	0,97525

In TOPCAT,
double-click table
name to open it

Click menu buttons
to get description of fields

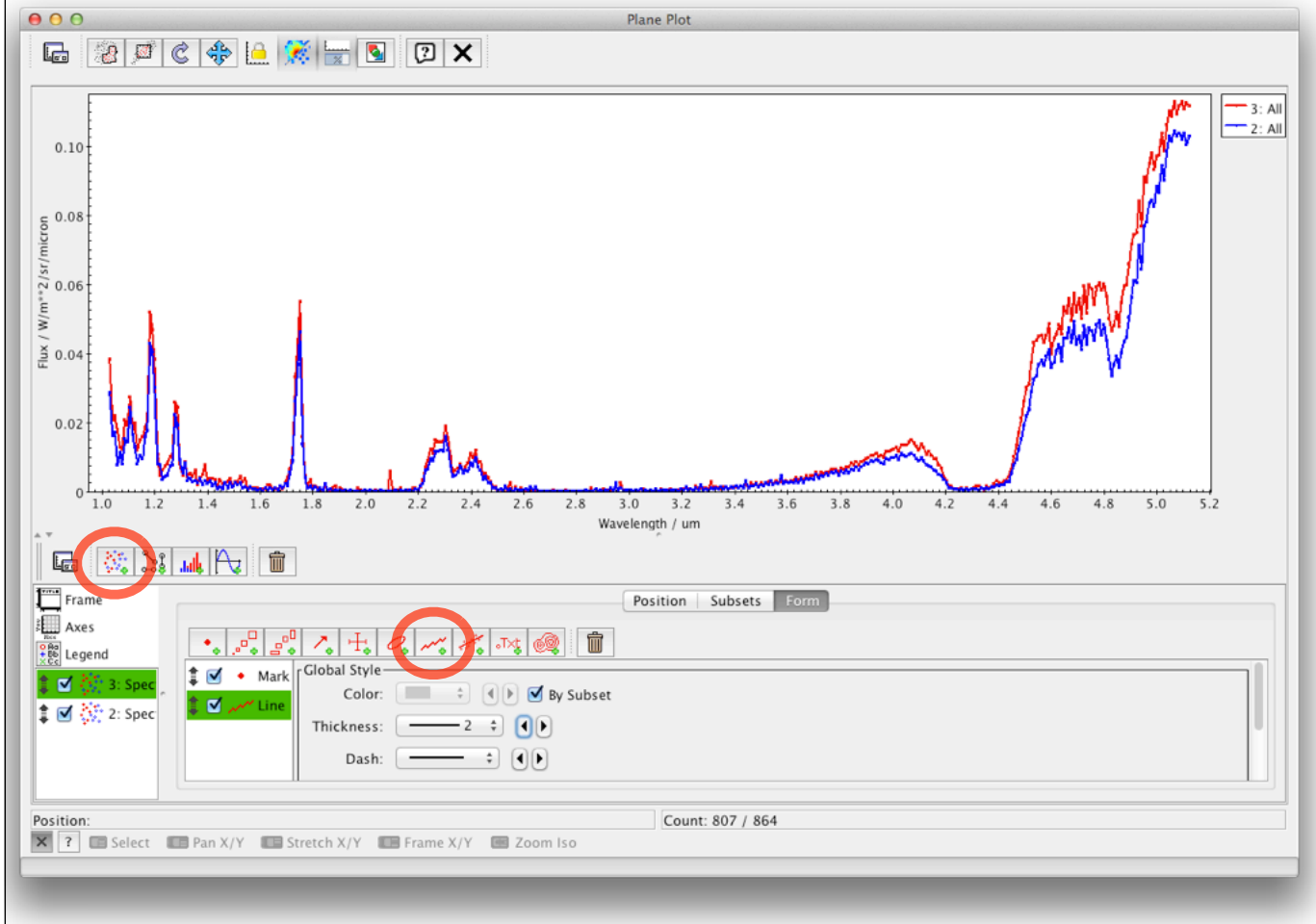
Visualizing data





In TOPCAT,
click "Plane Plot"
to display spectra

TOPCAT as a spectral tool



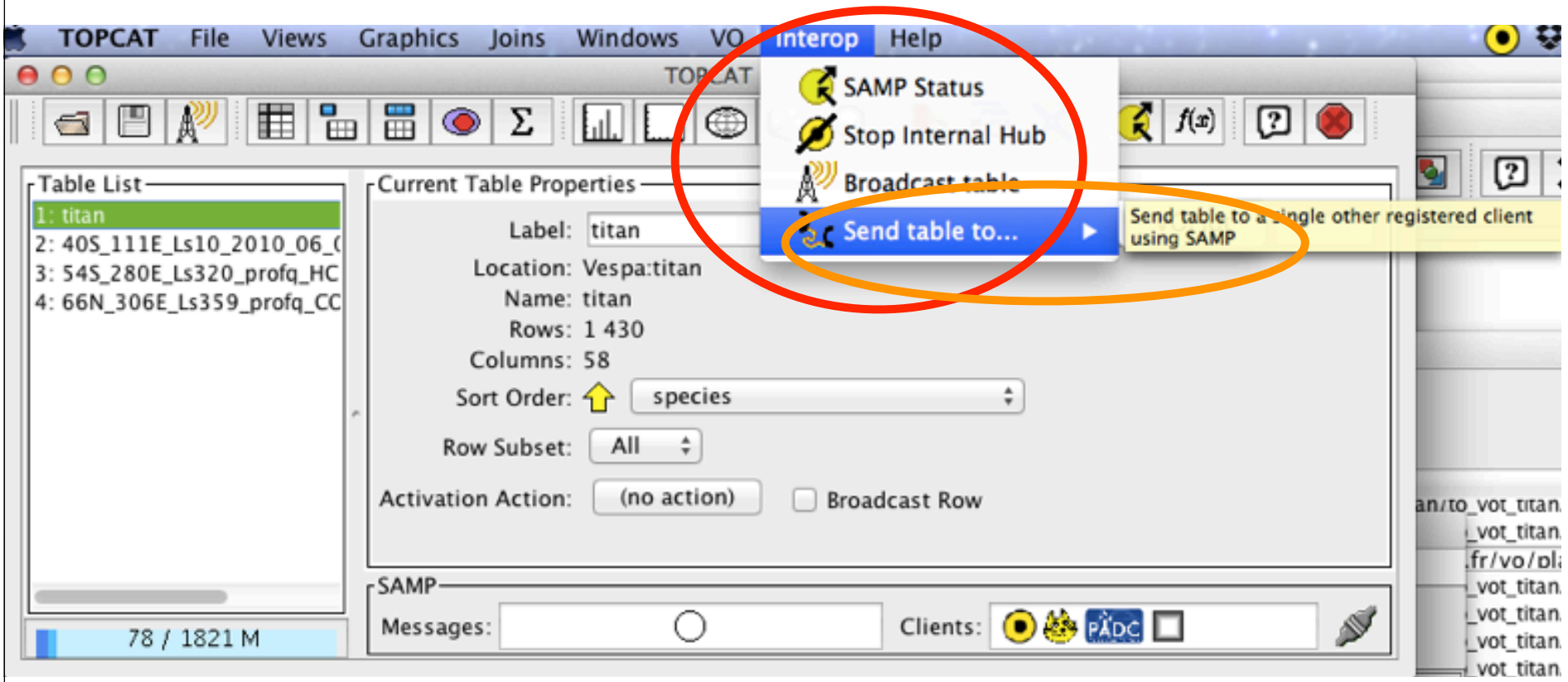
TOPCAT receives spectra from search interface, can overplot selections

Use "Plane plot" & check parameters

Click "New line form" to connect spectral channels

Click "Add new plot" to overplot spectra

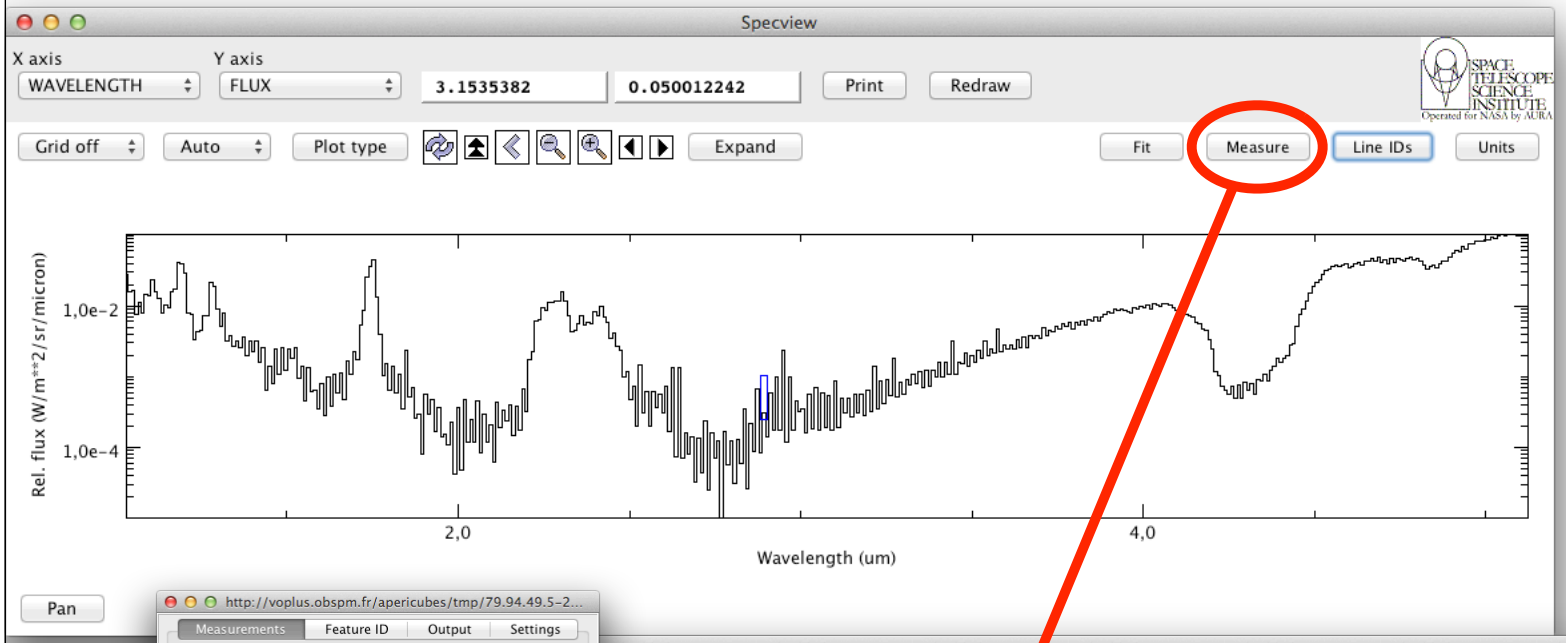
Sending data from TOPCAT



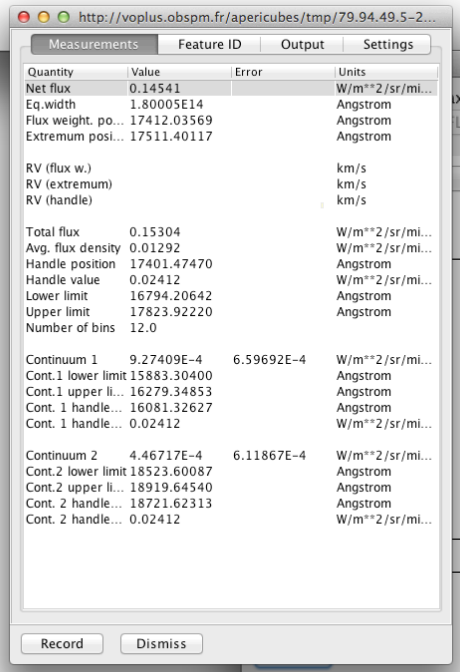
A table can be transmitted to other VO ploting tools,
e. g. CASSIS or SpecView (possibly after modification)

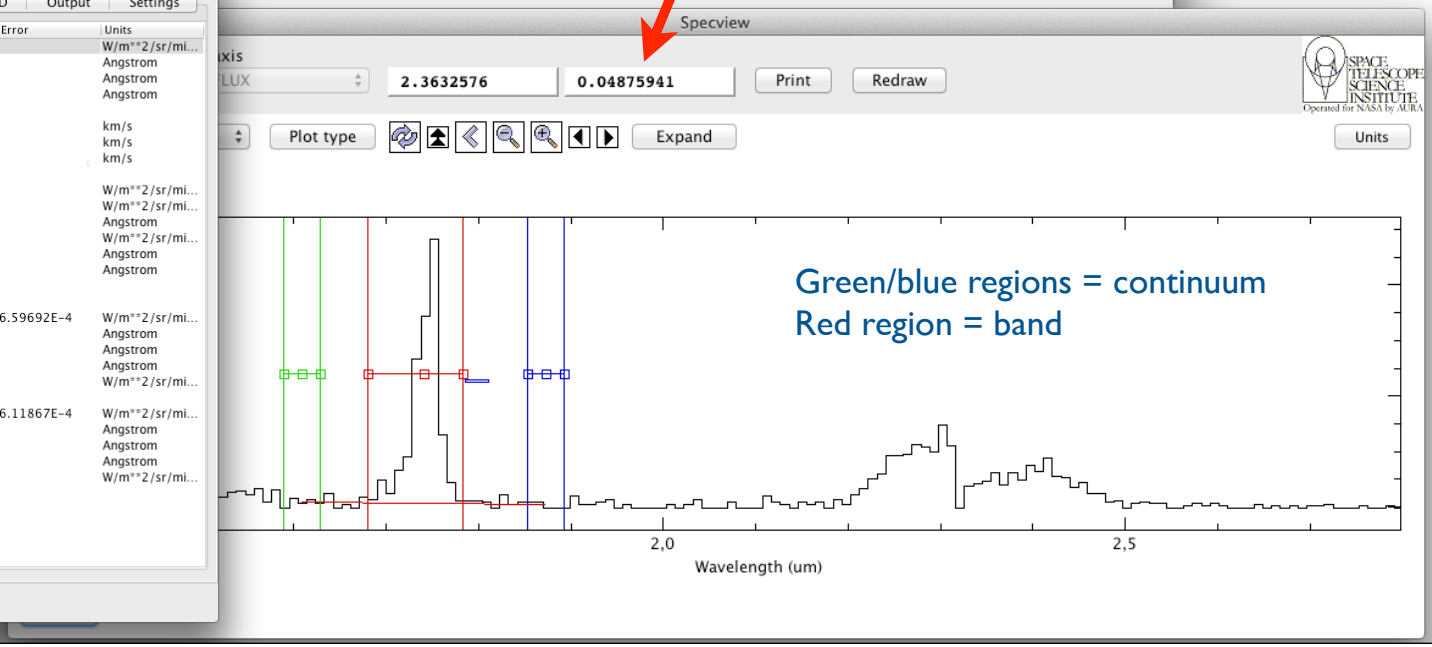
Spectral tools: Specview

Specview receives spectra from interface
Includes analysis functions

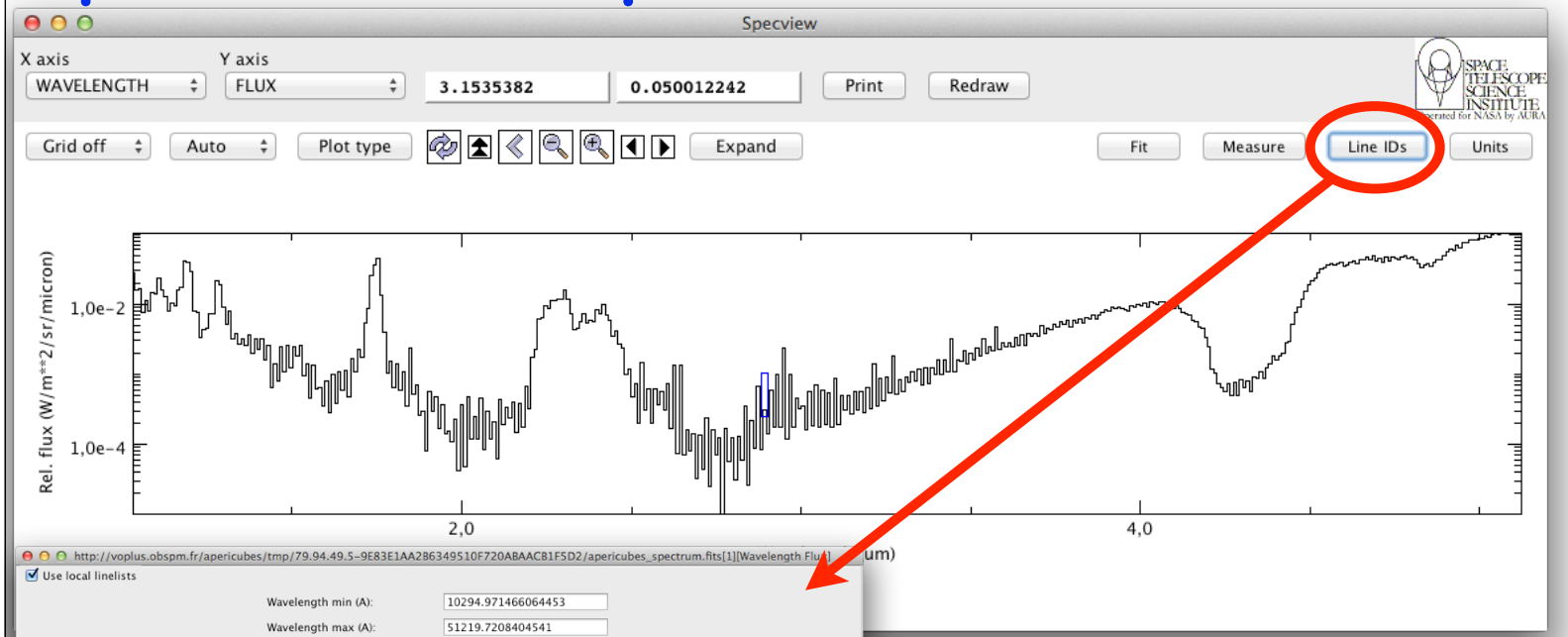


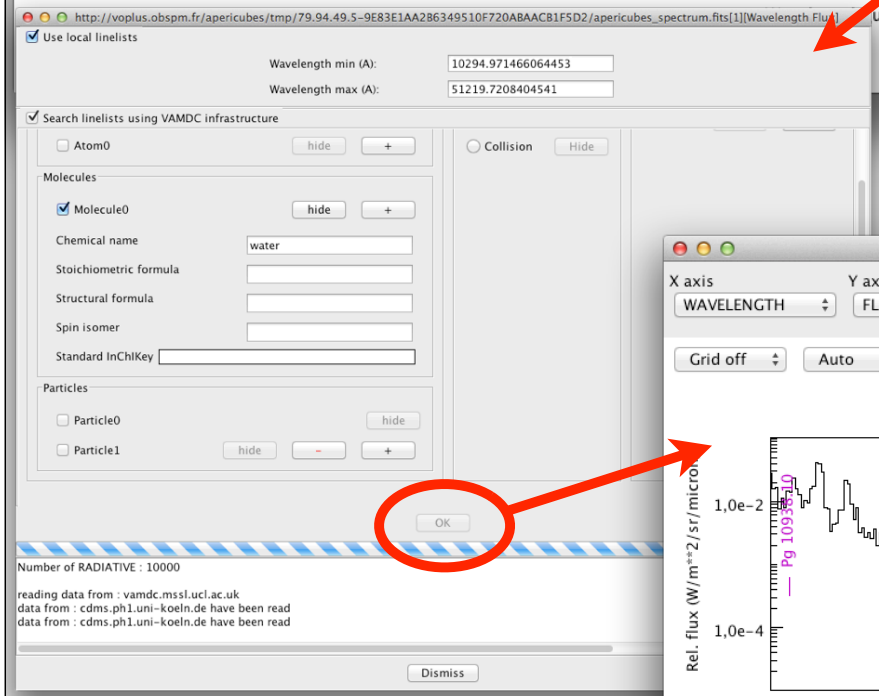
Click on "Measure" to perform continuum and band measurements

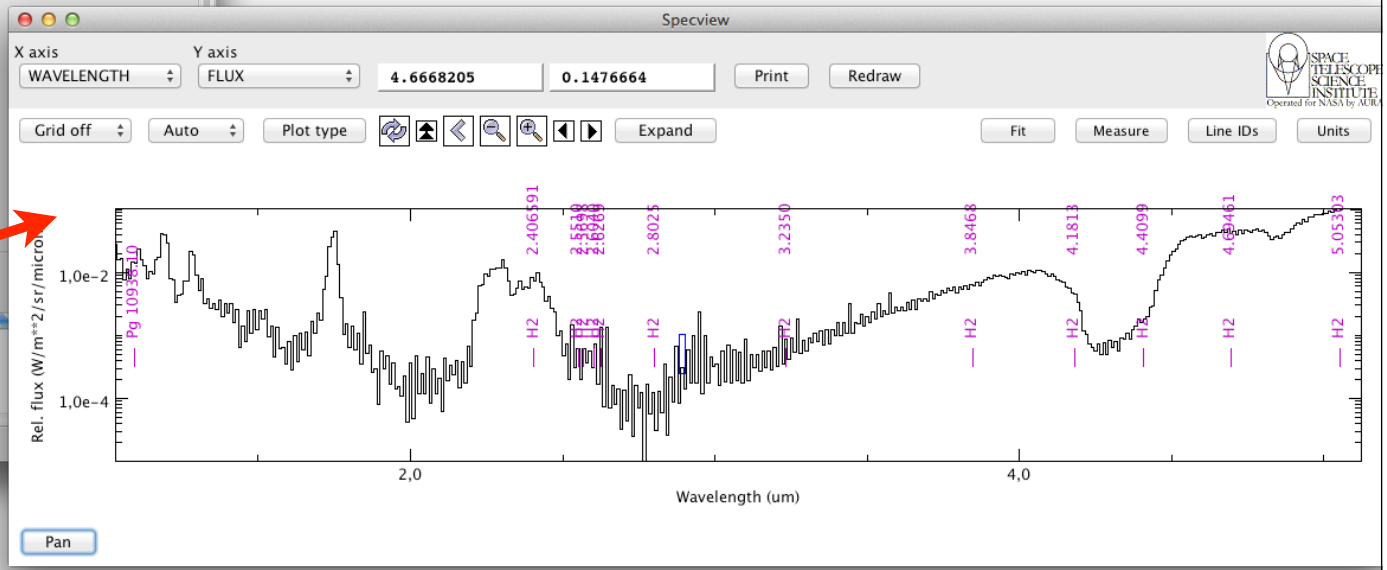




Spectral tools: Specview



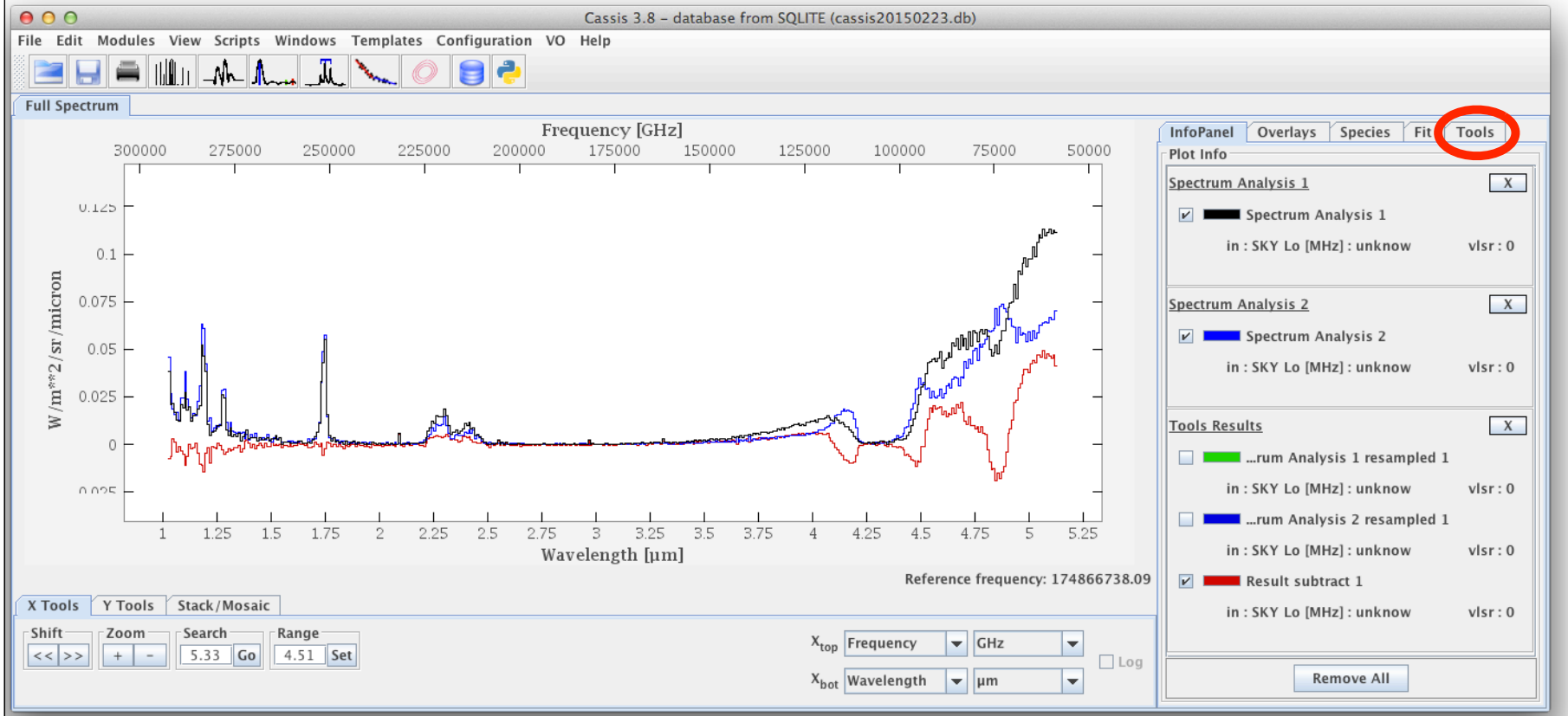




Click on "Line IDs" to query band line databases (from VAMDC) - pick up relevant ones

Spectral tools: *CASSIS*

CASSIS receives spectra from interface, can overplot a selection of spectra and manipulate them

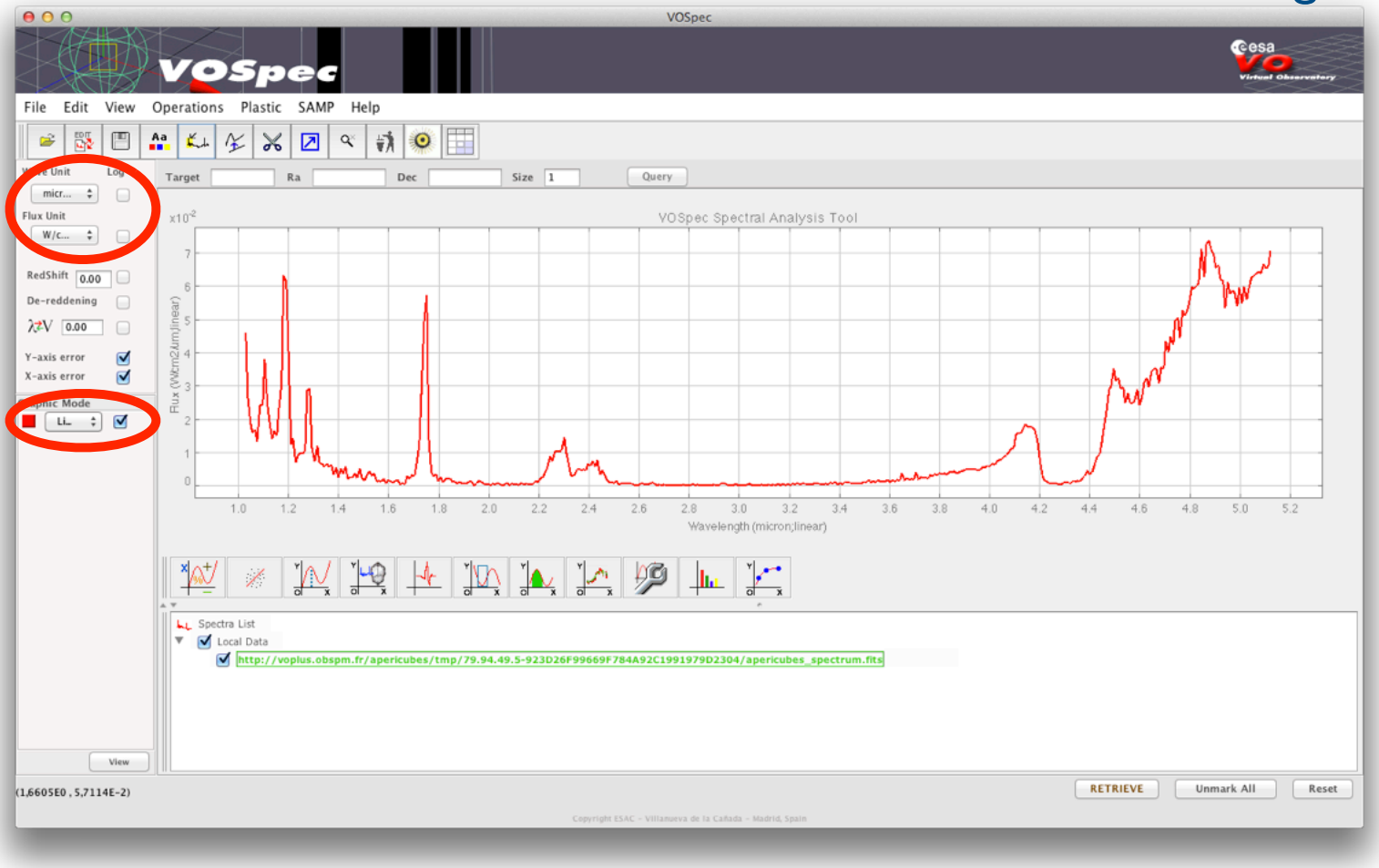


Press "shift" to get info on mouse location
"Alt"-drag to select a region (used in "Fit" tab)
"Alt"-click to put markers

Click the "Tools" tab to combine spectra
Spectra are resampled to a common wvl vector on the fly
The "Species" tab accesses internal line databases (most of them related to the ISM)
Includes LTE and RADEX modeling

Spectral tools: VOSpec

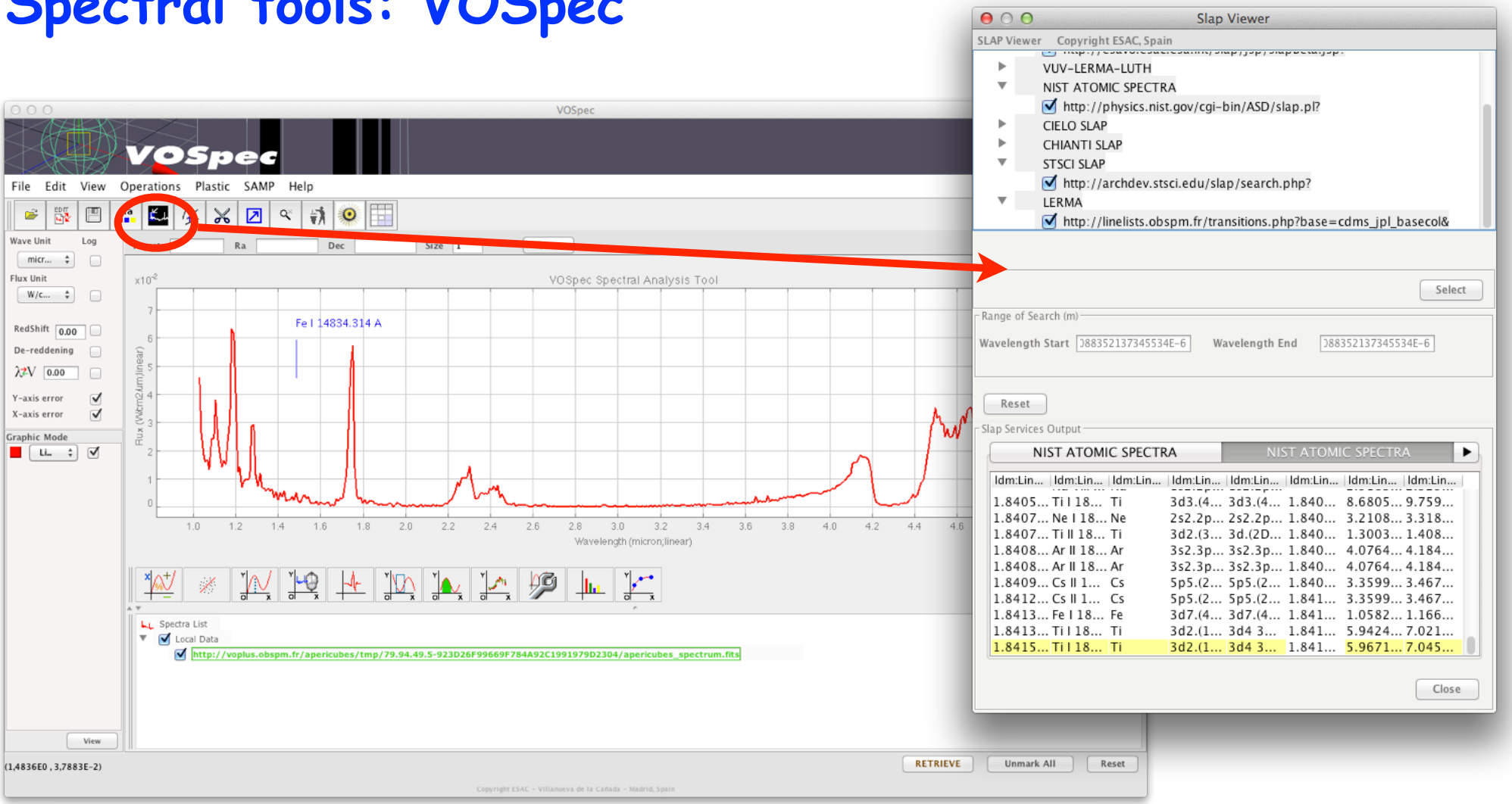
VOSpec receives spectra from interface, but does not recognize units



Select Wavelength in micron
& Flux in W/m^2/µm in input pannel
Then uncheck "Log" in axes & reselect
"W/m^2/µm" in flux menu
Select "Line" to connect channels

Currently does not understand radiance (W/m^2/sr/µm) or reflectance - being discussed with ESA & IVOA

Spectral tools: VOSpec



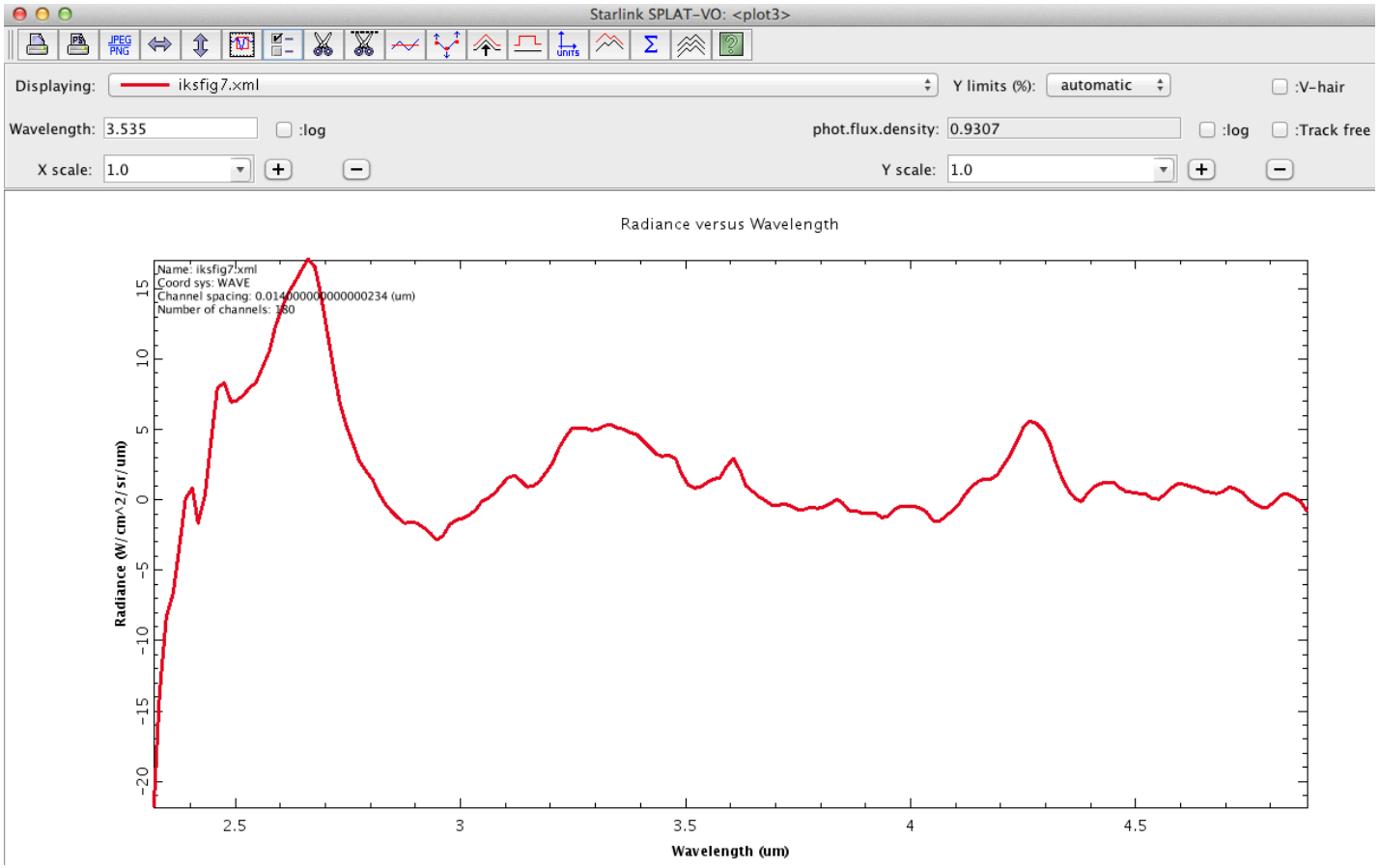
Click "Simple Line Access" button
Select area of interest
Select spectral databases in new window
Once loaded, lines are identified on mouse-over

Fitting functions available in "Operations" menu

Uses an older protocol which retrieves all lines in a given range => long and busy
Databases mostly related to the ISM (atoms)

Spectral tools: SPLAT-VO

SPLAT-VO receives spectra from interface
Includes analysis functions



Future developments

- Add search parameters for spectra of lab samples
  Enlarge to include sample and setup descriptions

- Better support for spectra in CASSIS and other tools (requires definitions for reflectance spectroscopy)

- Compare observational and lab data, test fitting procedures

- Support band lists in solid phase, for rapid identification of signatures?

The Europlanet 2020 Research Infrastructure project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654208.

http://www.europlanet-vespa.eu/