

NED Resolver TOPCAT Plug-in and AGN Candidates

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Motivation

- New detectors enhance our understanding of the universe...
 - New phenomena, new sources...
- Theories predict the existence of new phenomena, and sources...
 - → Observational Verification
- VO can help us to make observational strategies.
- Synergies of VO and other databases

Screen Shot

The screenshot shows a virtual machine desktop with the following elements:

- Desktop Environment:** Includes icons for File Manager, Leafpad, LXTerminal, and Chromium Web Browser.
- HTML Browser:** Displays the NASA/IPAC Extragalactic Database page for SDSS J091302.74+530322.5. The page title is "Spectral Energy Distribution (SED) for SDSS J091302.74+530322.5". It includes a zoom control set to 4X and a plot area with a blue background and white data points. The plot axes are labeled with wavelengths (100MHz, HI 6cm, 1mm, 100um, LK J, VU, 1kev) and a date stamp "Wed Mar 14 07:15:55 2012".
- TOPCAT(5): Table Browser:** A window displaying a table of astronomical data. The table is titled "Table Browser for 5: Buried AGNs" and contains 12 rows of data.

	RAJ2000 1	DEJ2000 1	SDSS	z	umag	gmag
1	10.99955	0.08995	004338.29+000523.8	0.8212	19.227	18.921
2	16.72332	0.80844	010653.59+004830.3	1.218	20.569	20.251
3	40.62772	-0.00825	024230.65-000029.7	2.5055	22.298	20.824
4	43.74294	-0.19504	025458.30-001142.1	0.9156	20.451	20.029
5	138.26146	53.05627	091302.74+530322.5	0.6307	19.719	19.024
6	143.88753	61.46071	093533.00+612738.5	0.4755	20.309	19.555
7	148.57053	17.85459	095416.92+175116.5	1.2887	18.118	18.065
8	153.52455	0.10566	101405.89+000620.3	0.1408	20.224	18.599
9	158.18969	50.37474	103245.52+502229.0	0.6632	19.584	18.649
10	161.29141	6.59974	104509.93+063559.0	1.1184	20.063	19.598
11	168.73231	42.53677	111455.75+423212.3	0.2566	19.422	18.738
12	173.73816	56.95032	113457.15+565701.1	0.8521	19.588	19.291

NED Search Interface

- The NED FAQ page
 - <http://ned.ipac.caltech.edu/help/faq1.html#1e>
- ConeSearch-like query language

<http://nedwww.ipac.caltech.edu/cgi-bin/nph-objsearch?>

[search_type=Near+Position+Search&in_csys=Equatorial&in_equinox=J2000.0&](http://nedwww.ipac.caltech.edu/cgi-bin/nph-objsearch?search_type=Near+Position+Search&in_csys=Equatorial&in_equinox=J2000.0&)

[lon=233.73798d&lat=23.50319d&radius=1.0&](http://nedwww.ipac.caltech.edu/cgi-bin/nph-objsearch?lon=233.73798d&lat=23.50319d&radius=1.0&)

[out_csys=Equatorial&out_equinox=J2000.0&of=ascii_tab](http://nedwww.ipac.caltech.edu/cgi-bin/nph-objsearch?out_csys=Equatorial&out_equinox=J2000.0&of=ascii_tab)

- center position : (R.A., Dec.) = (233.73798, 23.50319)
- radius : 1.0 arcmin
- output format : **space separated ascii table**

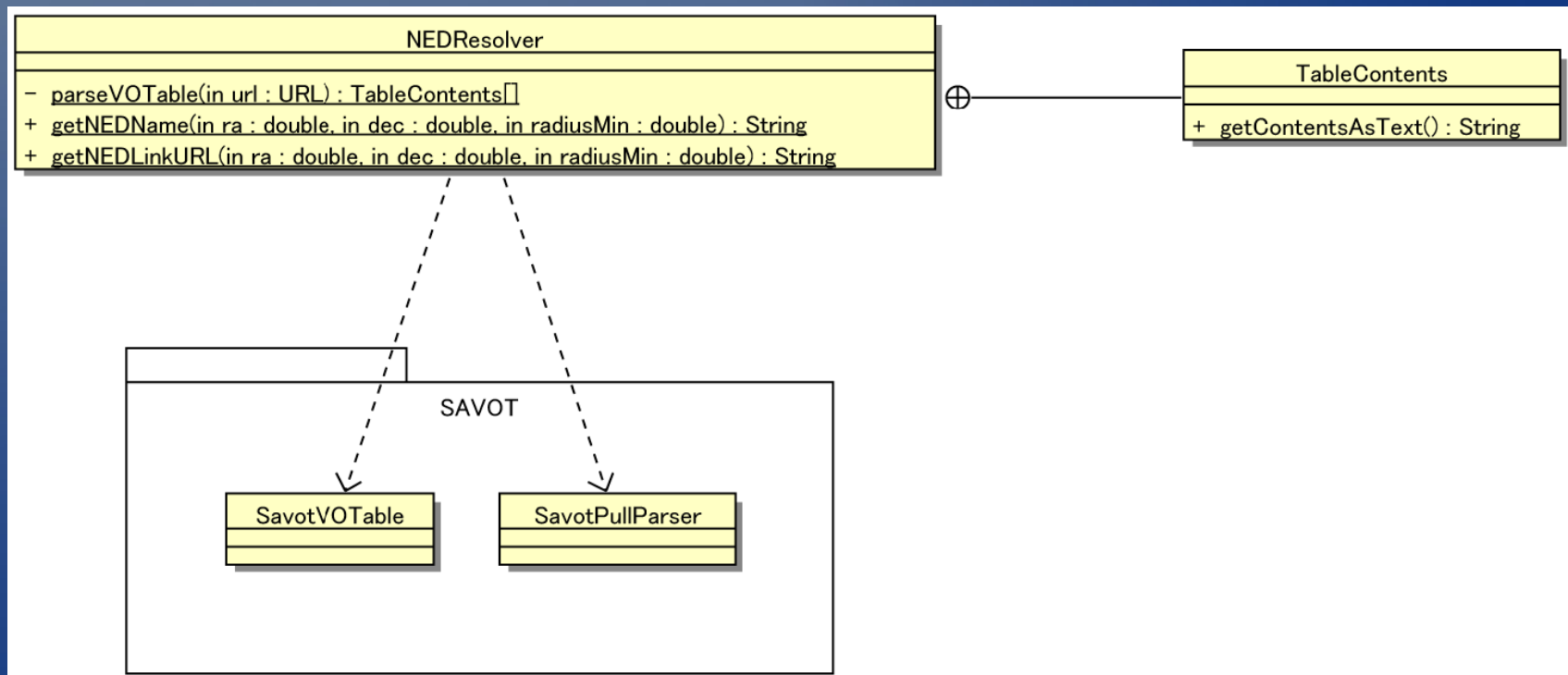
VOTable format is also available : of=xml_main

Implementation of the Plug-in

- Implemented as a user defined function

<http://www.star.bris.ac.uk/~mbt/topcat/sun253/jelExtend.html>

- input : R.A., Dec., radius
- output : String (access URL)



Demo / Note

- TOPCAT seems to evaluate each cell every time the GUI draw events are issued...
 - Very slow response
 - Once I save all the session to a file and restart TOPCAT, everything goes fine!

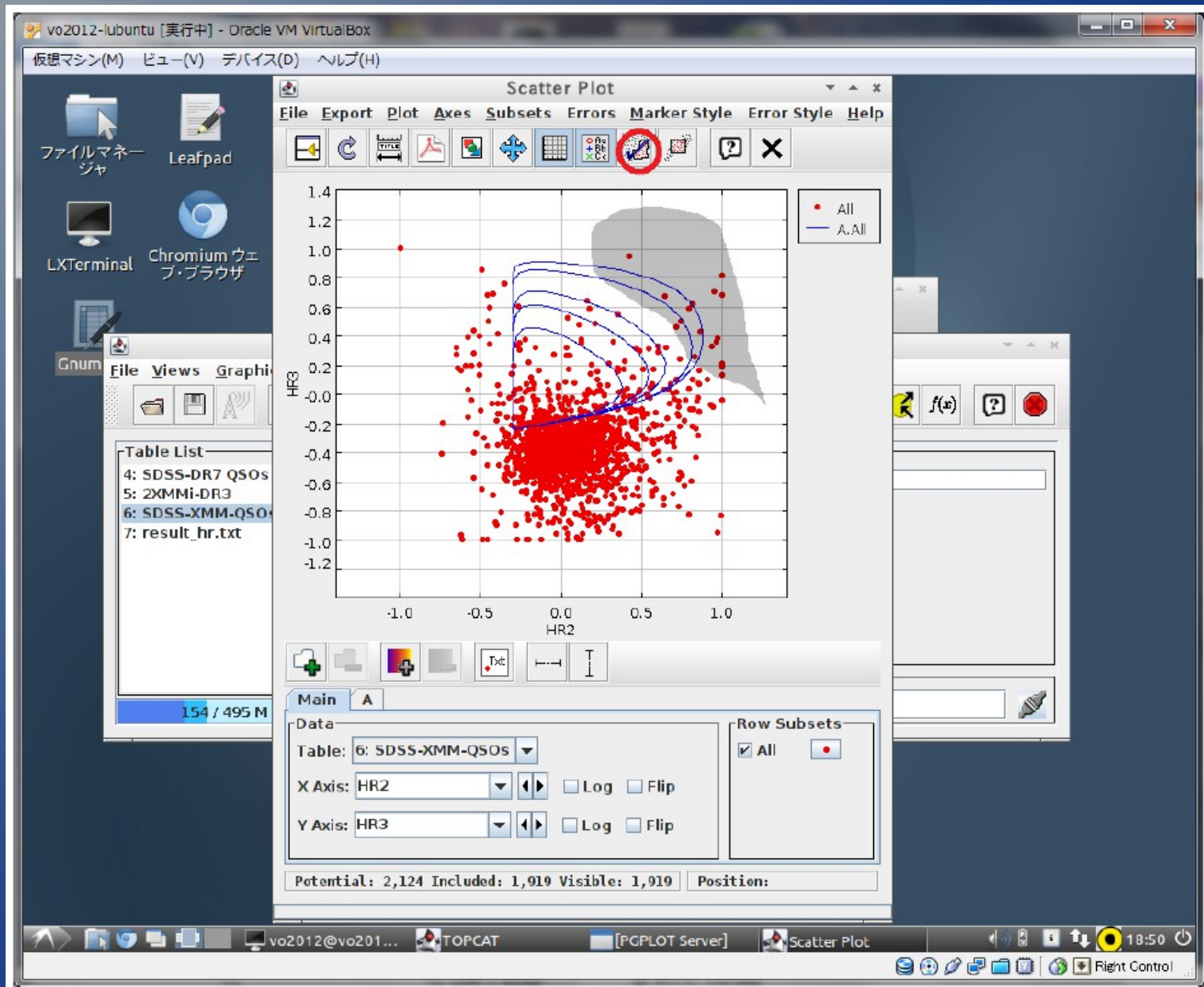
Use Case – Follow-up Observations

- A theory predicts that each galaxy experiences a heavily obscured AGN phase in the early stage of their growth. (Hopkins+ 2005)
- Heavily obscured AGNs are only observable in the >10 keV band due to the strong photo-electric absorptions.
- Hypothesis: absorbed photons can be reradiated in infrared bands.

Strategy

- Search for candidates in SDSS and XMM catalogs on VO
- Check the SED of each candidate
 - NED provides useful information for this purpose.

Demo 2



Conclusion

- Seamless connections between VO and external databases via web browsers are surprisingly useful in some cases.