Recent developments in VOIndia

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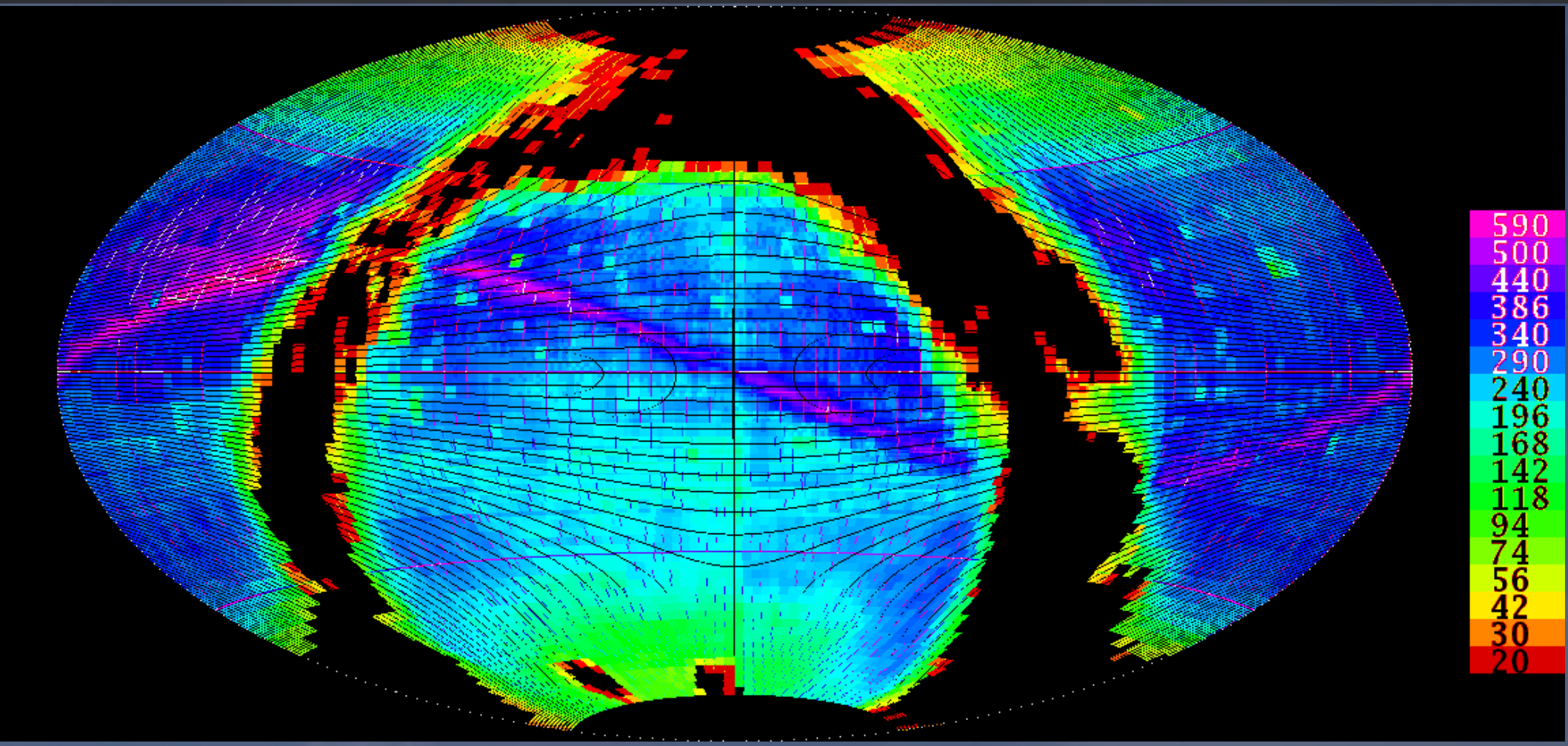
Outline

- CRTS Data Archive System
- VOPlot new features
- AstroStat feature enhancements

Catalina Real-Time Transient Survey

- The Catalina Real-Time Transient Survey covers thirty three thousand square degrees of the sky
- Catalina photometry covers objects in the range -75° < Dec < 70
- It discovers rare and interesting transient phenomena
- A data archive system is in development to serve both catalog data and the images
- Data Size
  - Catalog data is 5.8 TB
  - Image data is more than 4.3 TB (compressed)

Catalina Real-Time Transient Survey

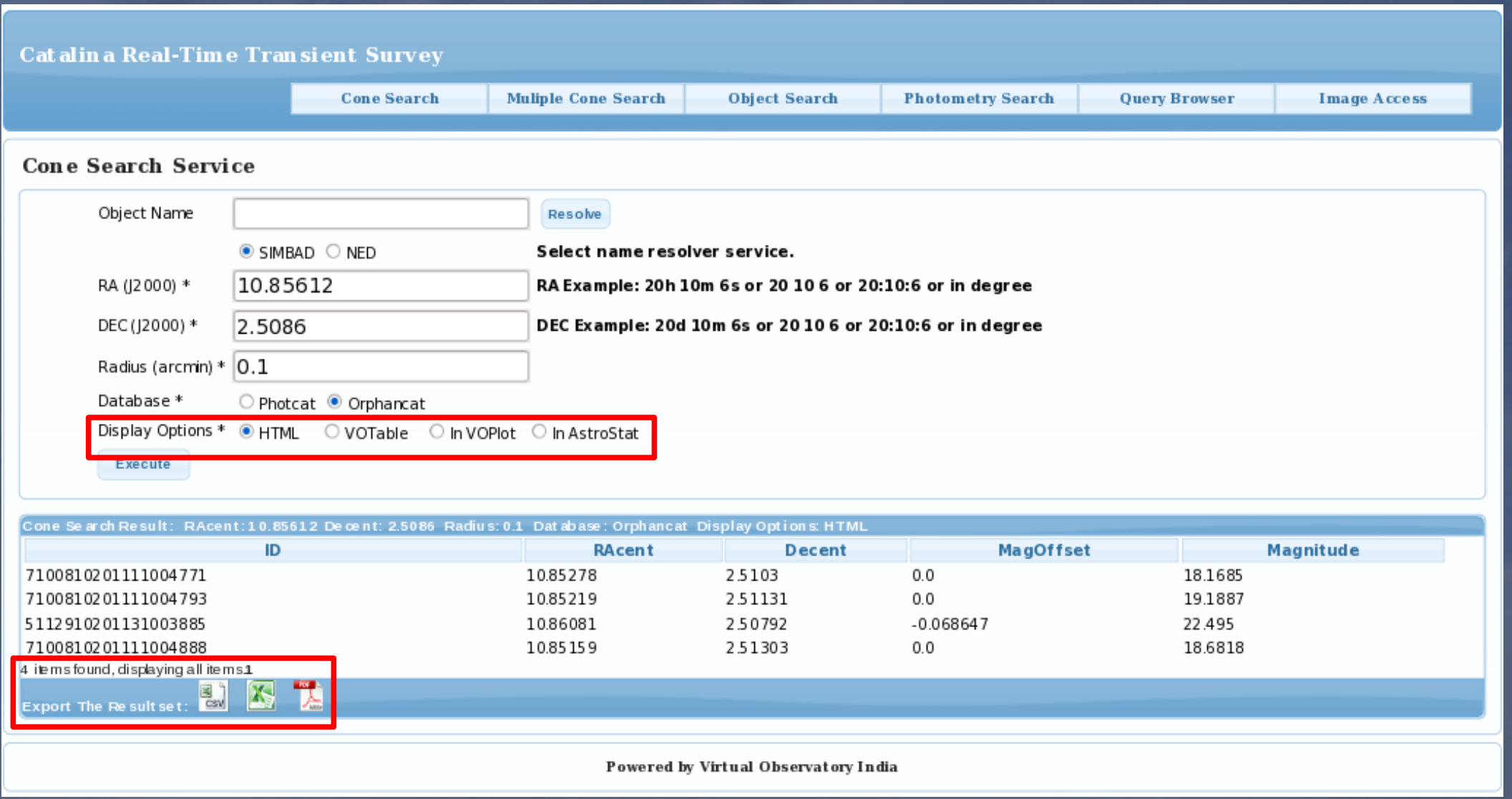


An aitoff projection of the sky region covered in equatorial coordinates (centered at RA = 0h)

CRTS Data Archive work so far

- Data Query Services
  - Search for photometry in a single location
  - Search for photometry in a multiple location
  - Retrieve photometry for a named object
  - Extract photometry by Catalina ID
- Multiple display options
  - As a html table
  - In a VOTable format
  - Result can be viewed with VOPlot and AstroStat
- Exporting resultset
  - As a Csv file, a Pdf document or as a Excelsheet

Simple cone search service



Cone search result in other formats

ID	RAcent	Decent	MagOffset	Magnitude
7100810201111004771	10.85278	2.5103	0.0	18.1685
7100810201111004793	10.85219	2.51131	0.0	19.1887
5112910201131003885	10.86081	2.50792	-0.068647	22.495
7100810201111004888	10.85159	2.51303	0.0	18.6818

PDF

	A	B	C	D	E
1	ID	RAcent	Decent	MagOffset	Magnitude
2	7.10081E+18	10.85278	2.5103	0	18.1685
3	7.10081E+18	10.85219	2.51131	0	19.1887
4	5.11291E+18	10.86081	2.50792	-0.068647	22.495
5	7.10081E+18	10.85159	2.51303	0	18.6818

Excel

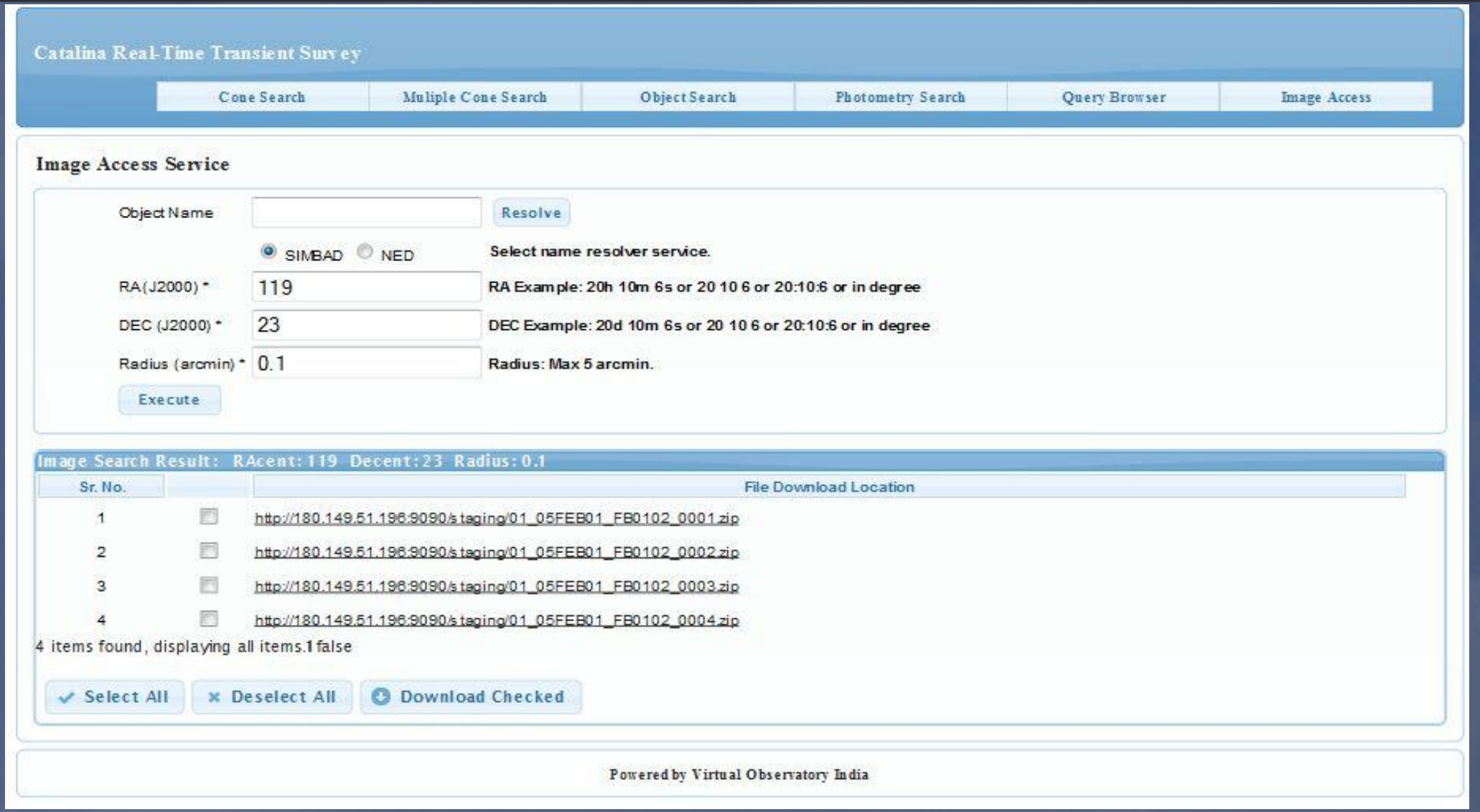
```
ID,RAcent,Decent,MagOffset,Magnitude
7100810201111004771,10.85278,2.5103,0.0,18.1685
7100810201111004793,10.85219,2.51131,0.0,19.1887
5112910201131003885,10.86081,2.50792,-0.068647,22.495
7100810201111004888,10.85159,2.51303,0.0,18.6818
```

CSV

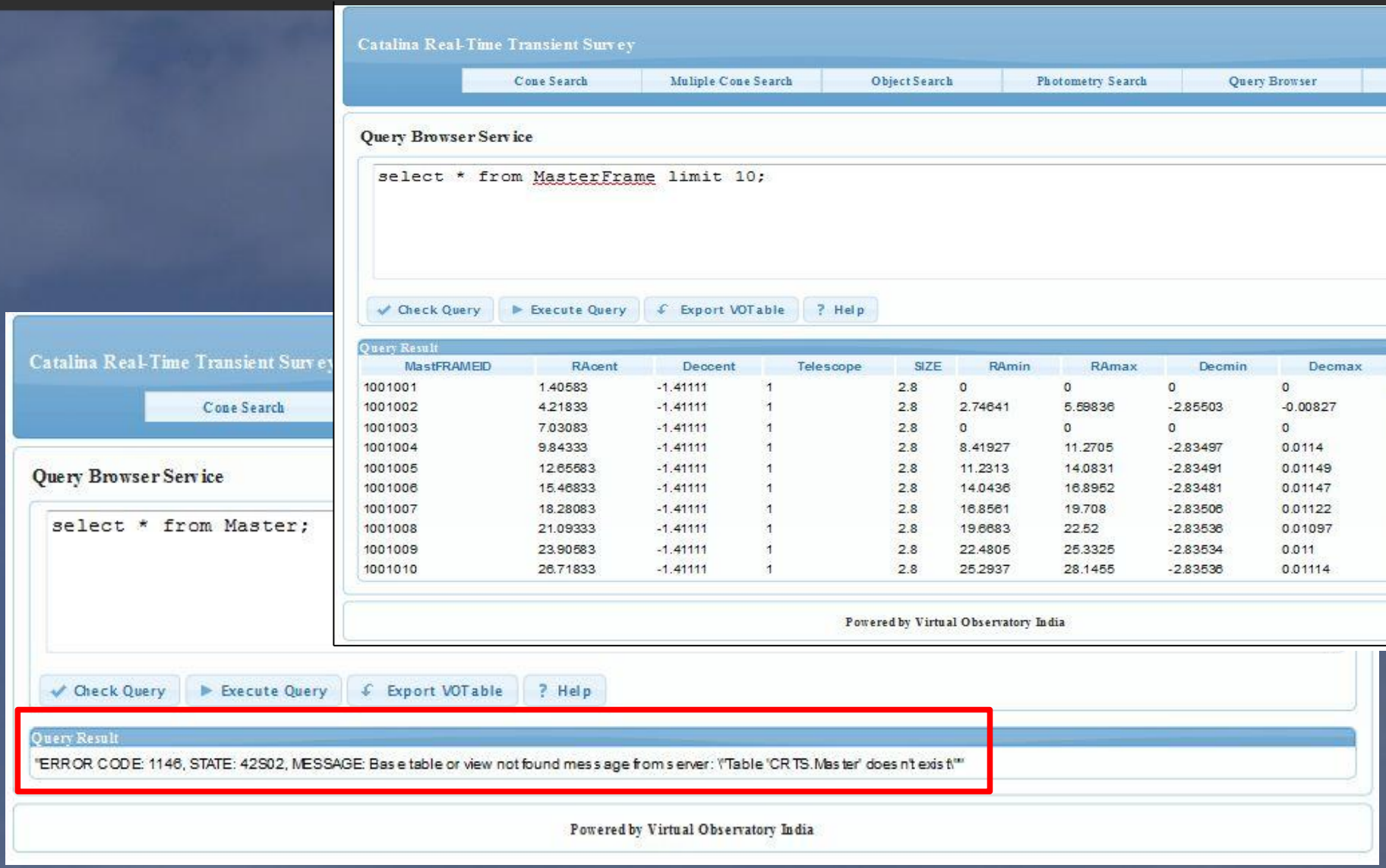
CRTS Data Archive work continues…

- Image Cutout Service (under development)
  - Functionality added to download images retrieved by the service
- Query Browser for customized queries
  - User can write advanced queries
  - Support for query validation
  - VOTable export option
- …

Accessing images via SIAP



Query browser



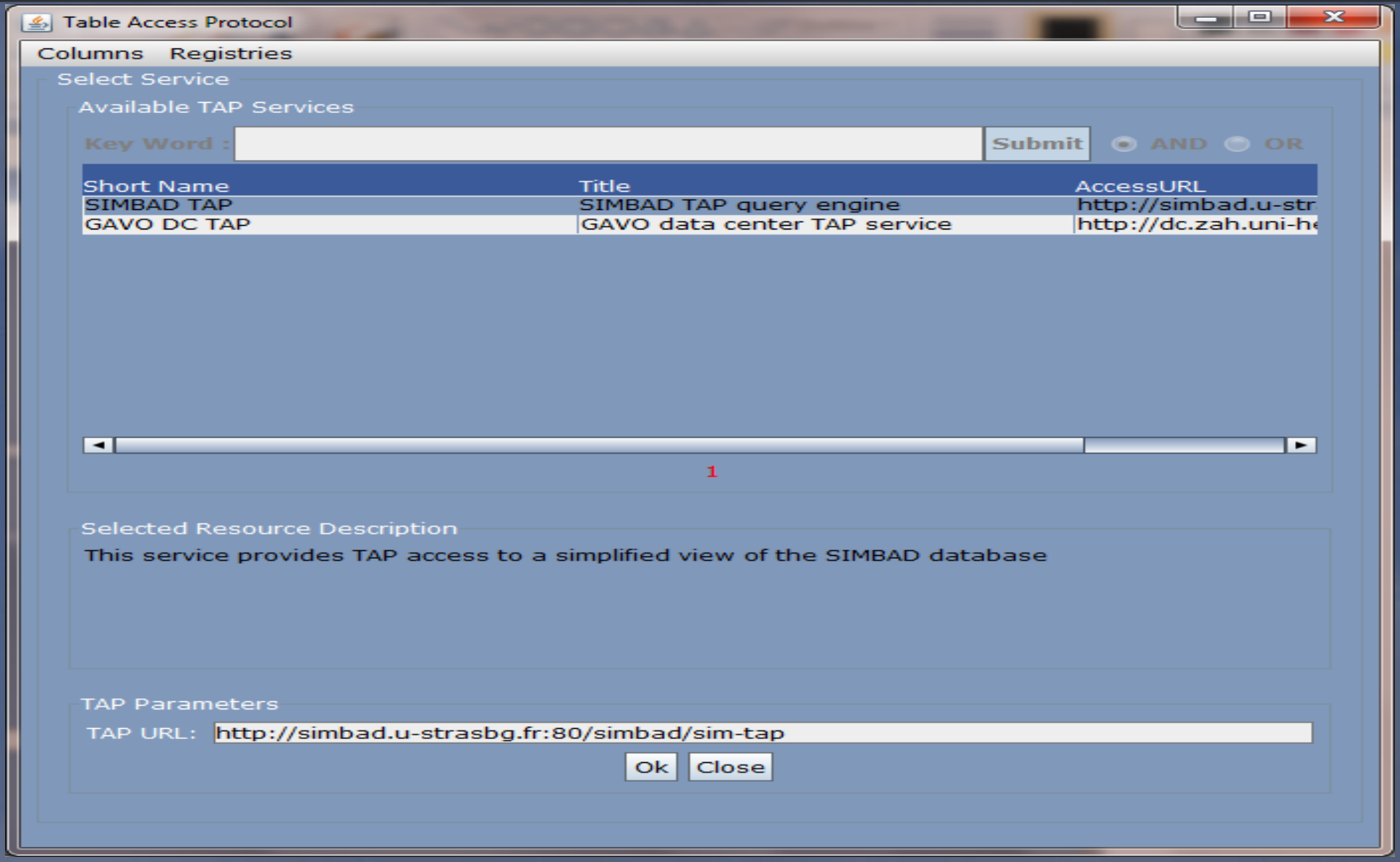
CRTS Data Archive people involved

- From Caltech
  - Ashish Mahabal
  - Andrew Drake
  - Mathew Graham
  - George Djorgovski
- From IUCAA
  - Ajit Kembhavi
  - Sarah Ponrathnam
  - Ninan Sajeeth Philip
  - Varun Bhalerao
- . . .

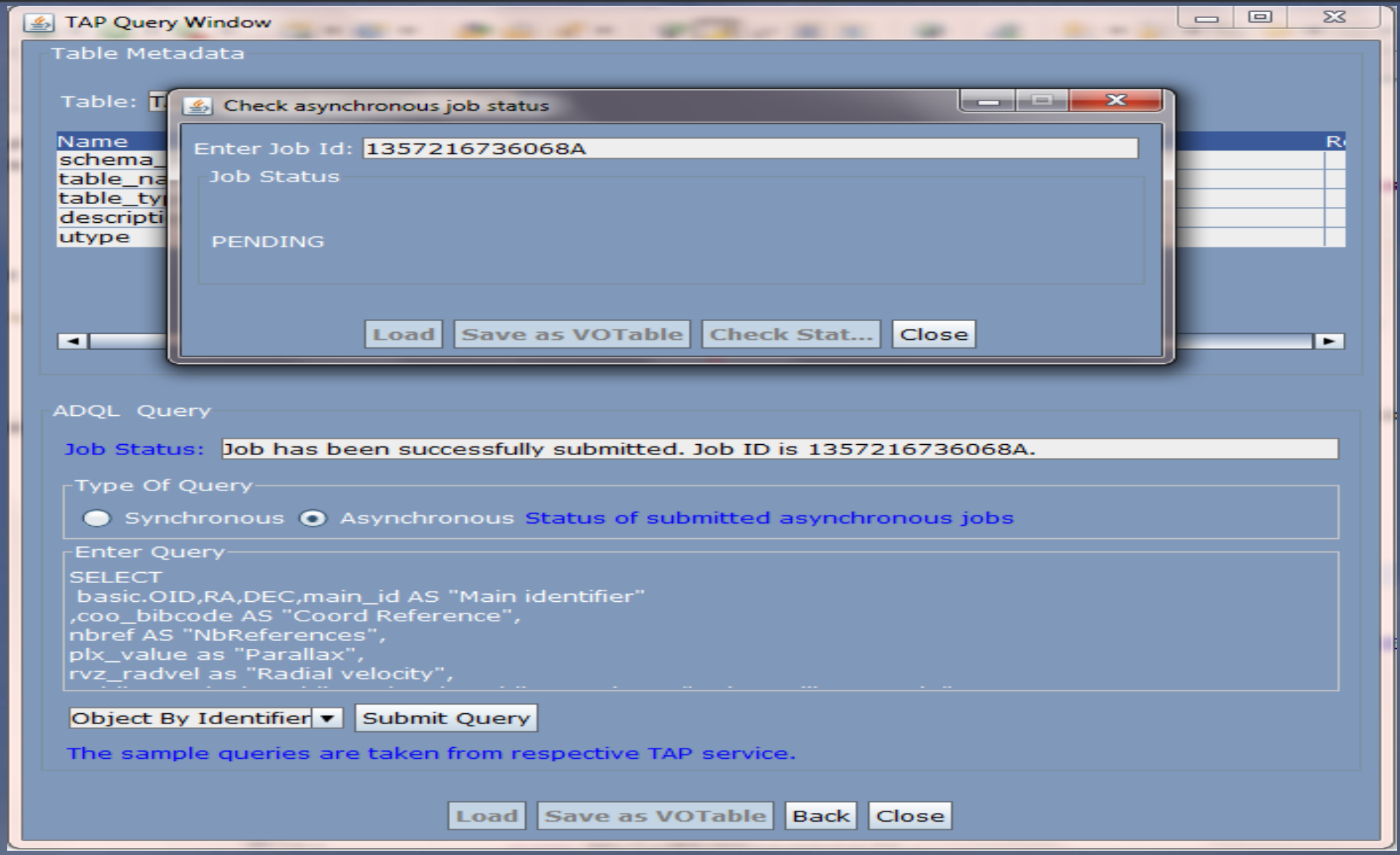
VOPlot

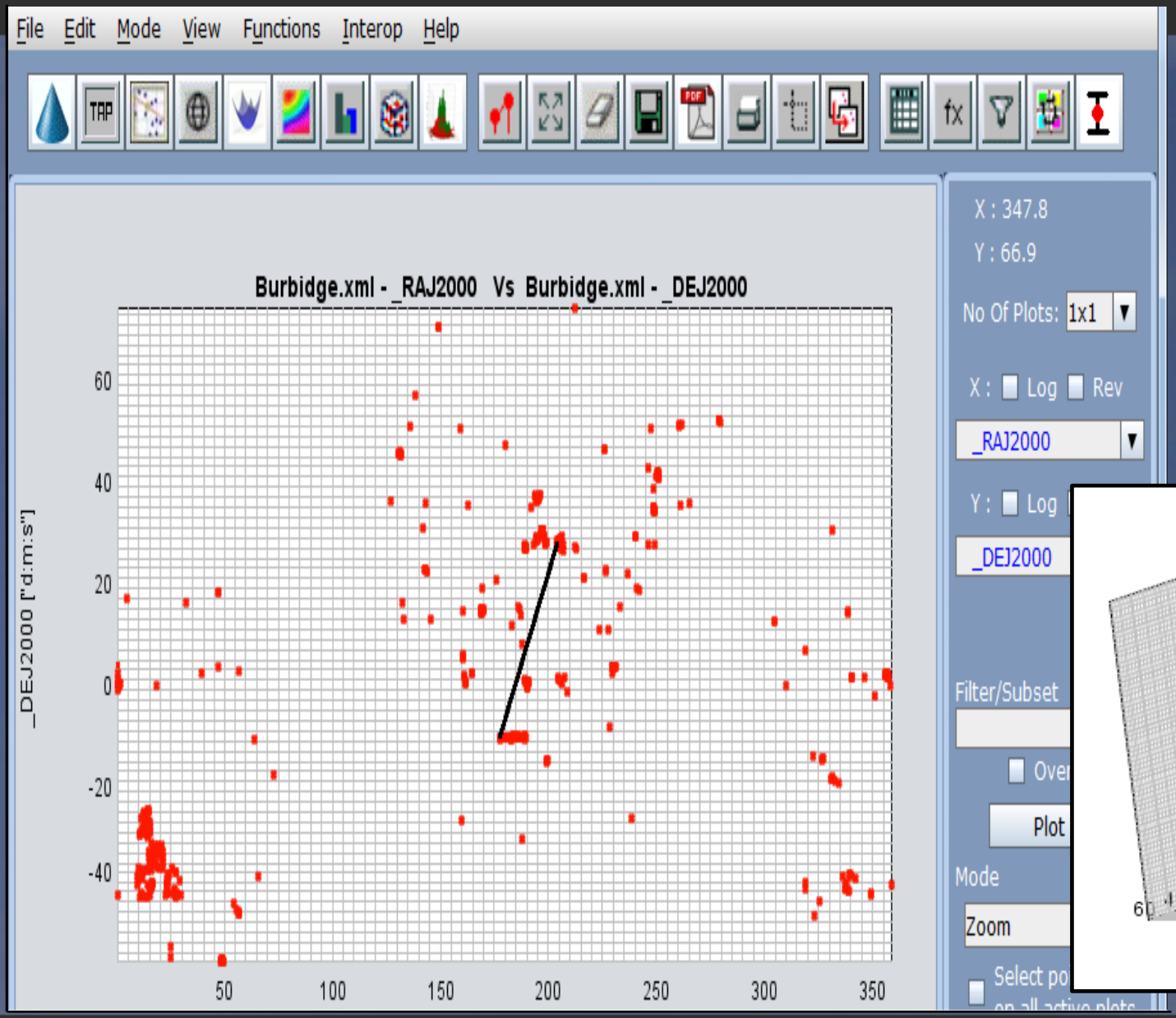
- Recently released version 1.8
- Support for TAP added
  - Returns a VOTable after querying to the service supporting TAP
- A fully updated helpset is now bundled within VOPlot
- Minor ticks has been included within the plot properties
  - User can view the points with a greater precision of the point location
- New Functionality Draw Line added
- VOPlot-lite is available as a java applet

VOPlot displaying list of available TAP services



Asynchronous query example




File Edit Mode View Functions Interop Help
Burbidge.xml - _RAJ2000 Vs Burbidge.xml - _DEJ2000
_DEJ2000 ["d:m:s"]
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150
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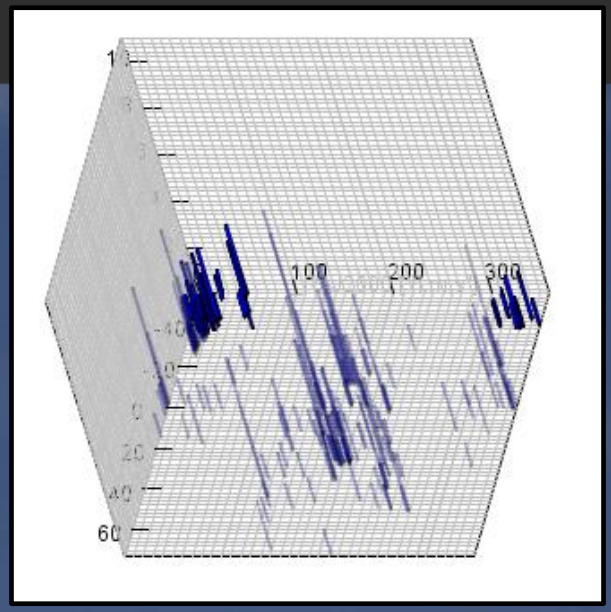
250
300
350
X : 347.8
Y : 66.9
No Of Plots: 1x1
X : Log Rev
_RAJ2000
Y : Log
_DEJ2000
Filter/Subset
Plot
Mode
Zoom
Select po


100
200
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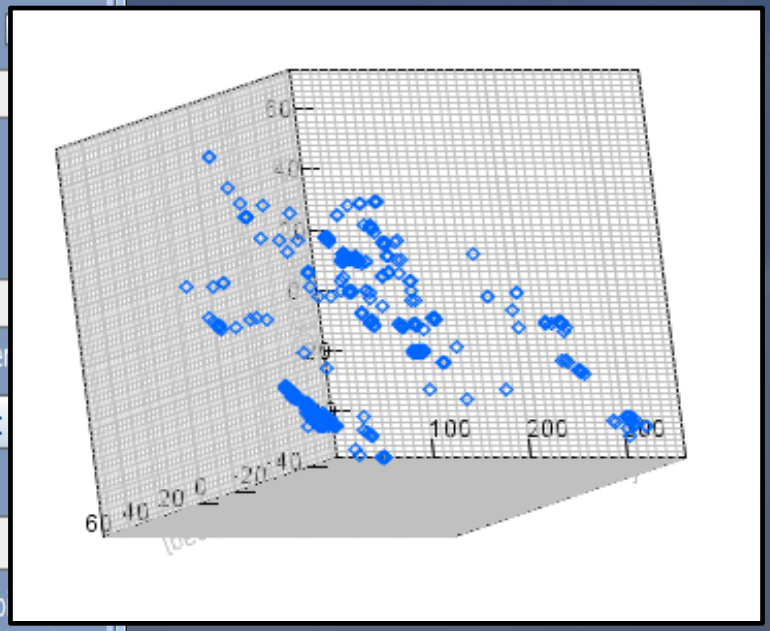
100
200
60
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0
-20
-40

From official page

Instructions for Incorporating VOPlot in a Web Application

Please click here for help on incorporating latest **VOPlot-lite version** in a web-based Application.

Click here for help on incorporating VOPlot (**version 1.5 and below**) in a web-based Application.

Note: *If you are intrested in plotting huge catalogues like Tycho and UCAC, you can try VOMegaPlot or VOMegaPlot Client Server tool. VOMegaPlot supports only a subset of VOPlot's features.*

Downloads

WebStart for **stable** version of VOPlot

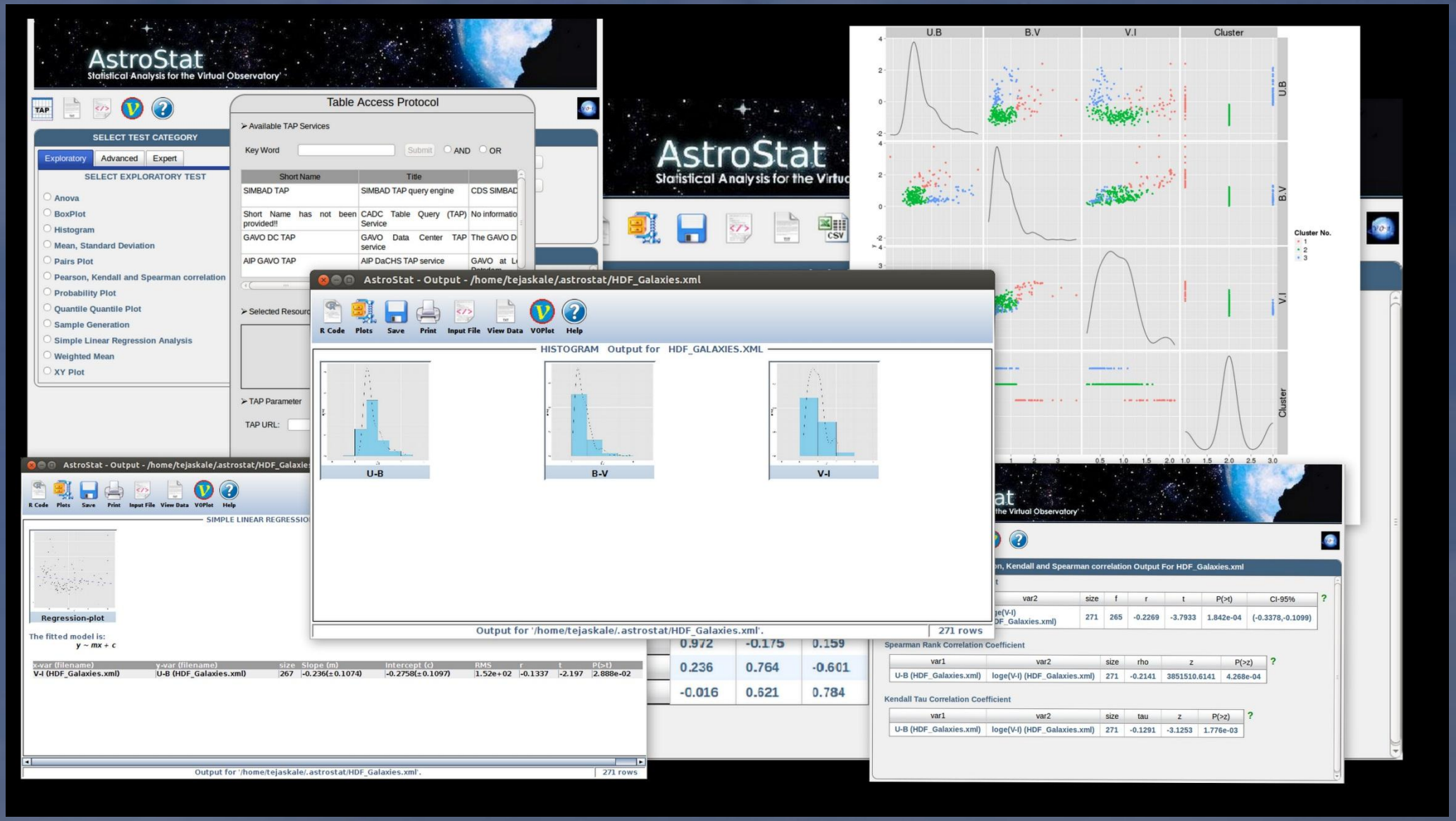
WebStart for latest **beta** version of VOPlot

Applet version for latest VOPlot-lite

Version	Download File	Userguide	Released On
1.8	VOPlot1_8.zip (requires java 6 or above)	VOPlot_UserGuide_1_8	06 Feb 2013

AstroStat

- VO-I package for statistical analysis of astronomical data
- Released the beta version in February 2013
- Available as a web application tool and a standalone version
- Caters across three main test categories
- 31 different statistical tests are available
- Seamless integration with VOPlot


AstroStat
Statistical Analysis for the Virtual Observatory
Table Access Protocol
SELECT TEST CATEGORY
Exploratory
Advanced
Expert
SELECT EXPLORATORY TEST
Anova
BoxPlot
Histogram
Mean, Standard Deviation
Pairs Plot
Pearson, Kendall and Spearman correlation
Probability Plot
Quantile Quantile Plot
Sample Generation
Simple Linear Regression Analysis
Weighted Mean
XY Plot
AstroStat - Output - /home/tejaskale/.astrostat/HDF_Galaxies.xml
HISTOGRAM Output for HDF_GALAXIES.XML
U-B
B-V
V-I
Regression-plot
The fitted model is:
y ~ mx + c
Output for '/home/tejaskale/.astrostat/HDF_Galaxies.xml'.
271 rows
U.B
B.V
V.I
Cluster
Cluster No.
Spearman Rank Correlation Coefficient
Kendall Tau Correlation Coefficient

AstroStat ongoing enhancements

- Additional tests
  - Will cover a broader range of statistical routines including
    - Time series analysis
    - Survival analysis
    - Non-parametric regression
    - Density estimation

- New features
  - Ability to create routines of tests with a single instruction
  - Support for creating a new column
  - Creating a filter
  - …

Thank You !

Comments, feedback or suggestions, please email to
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