

Hello!

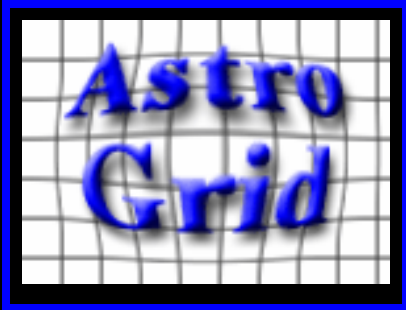
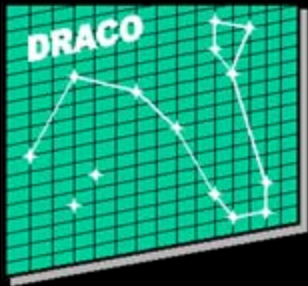
Data Visualization and Statistics in the VO Environment

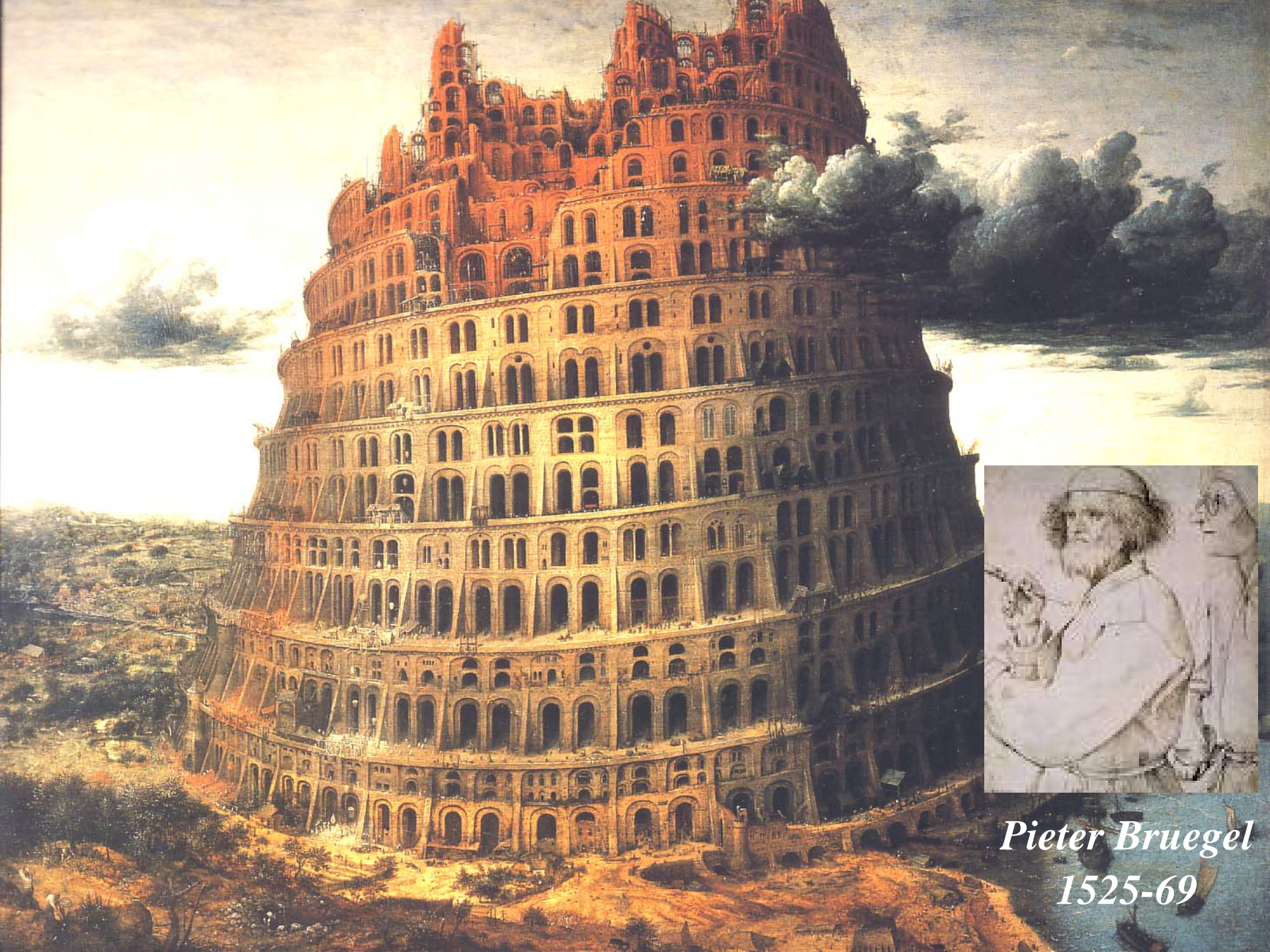


Ajit Kembhavi

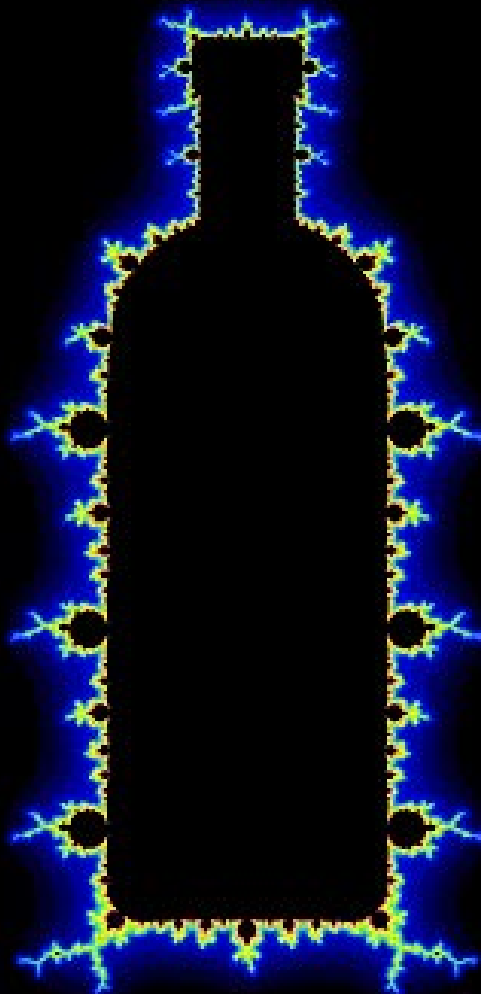
IUCAA,

Pune, India

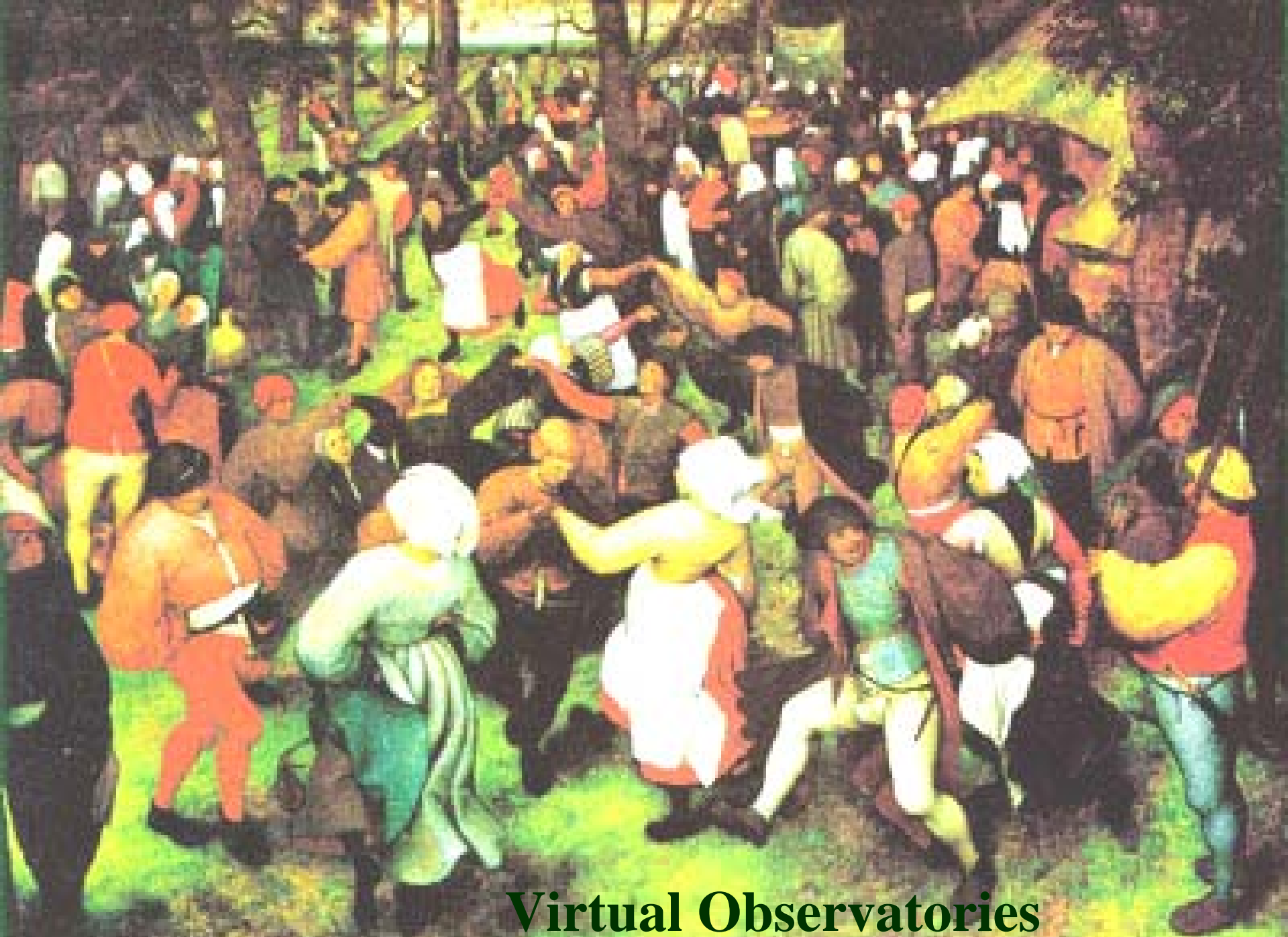




Pieter Bruegel
1525-69



ABSOLUT CHAOS.



Virtual Observatories

The Many Faces of

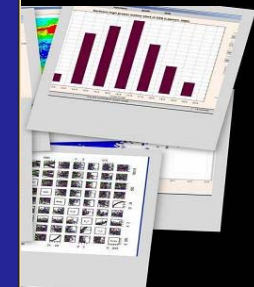
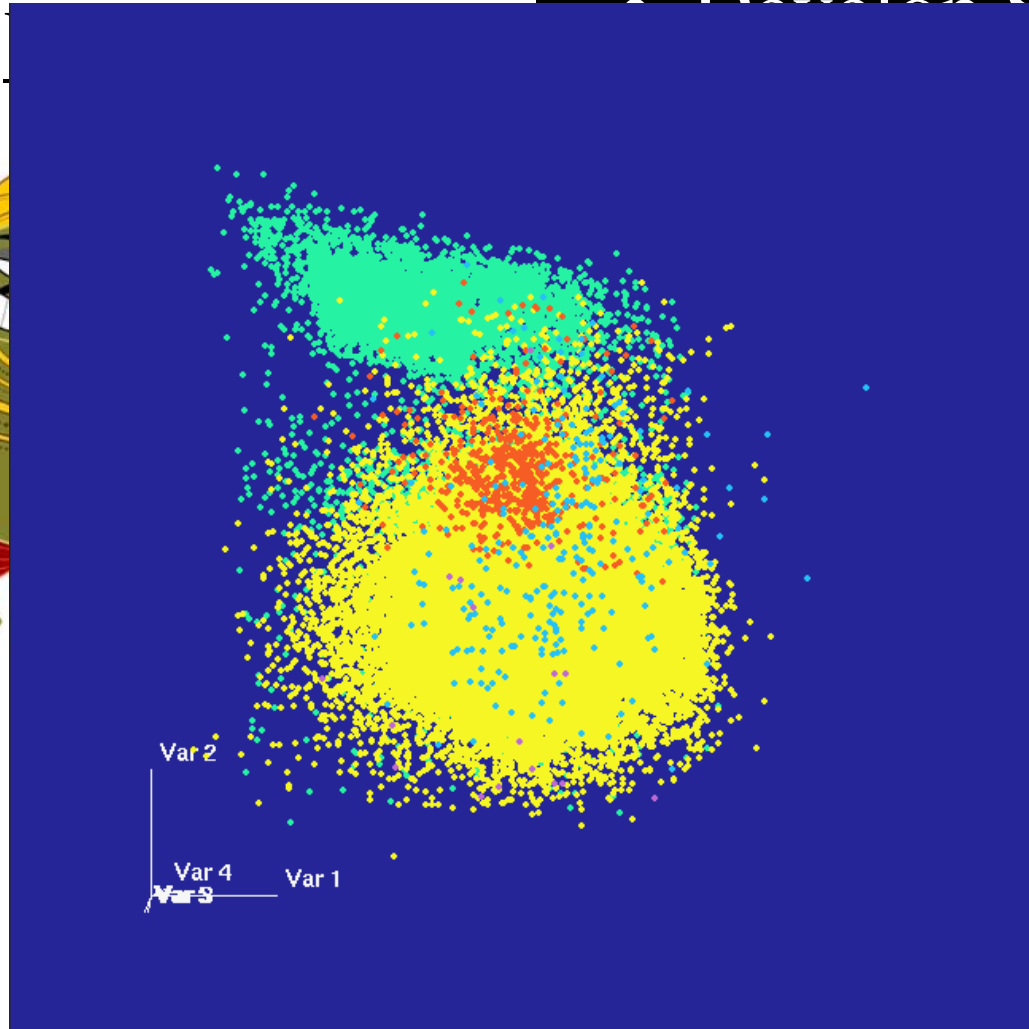
Developer Standards

Tools

Applications

Archives

New



VO-India Software Projects

VOPlot Visualizer for catalogue data
VOCat User Interface and Query Tool
C# FITS Library Utility Package
VOStat Statistical Package
VODesktop, VOMosaic

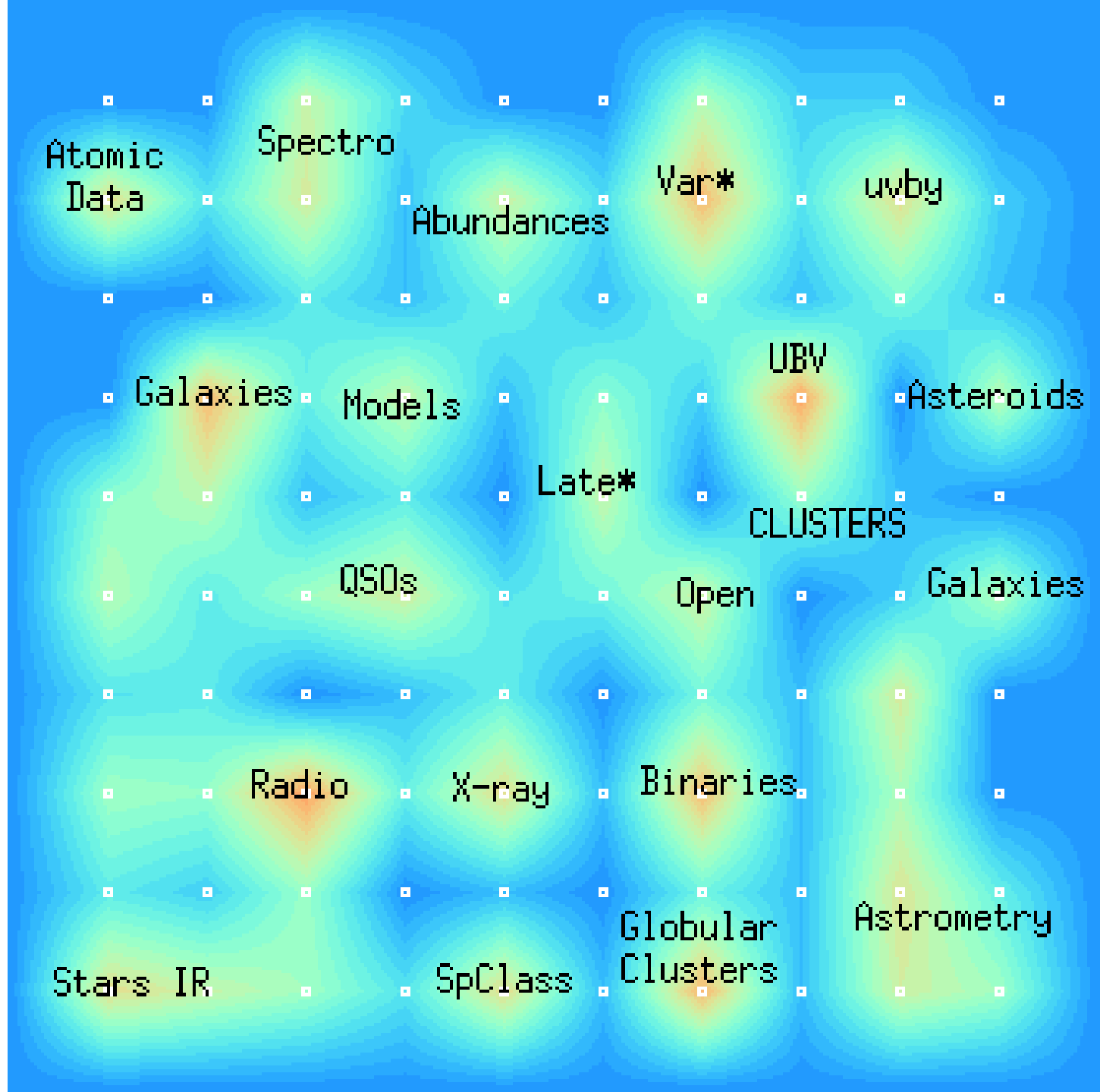
All tools are PLASTIC and SAMp compatible:
PLatform for ASTronomical Tool InterConnection
Simple Application Messaging Protocol

Tools

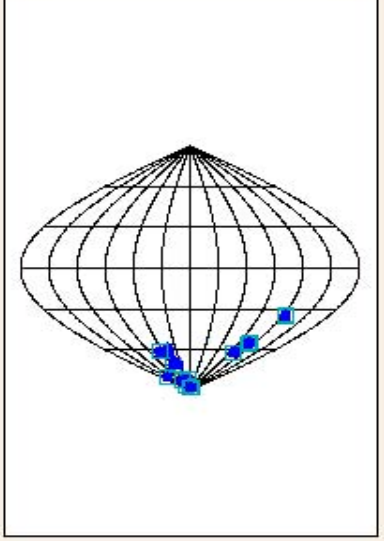
VOPlot, VOStat



6283
catalogues



Sinusoidal Projection



{1}Table1

Long : NAN
Lat : NAN

Projection :

Sinusoidal

Center :

Standard

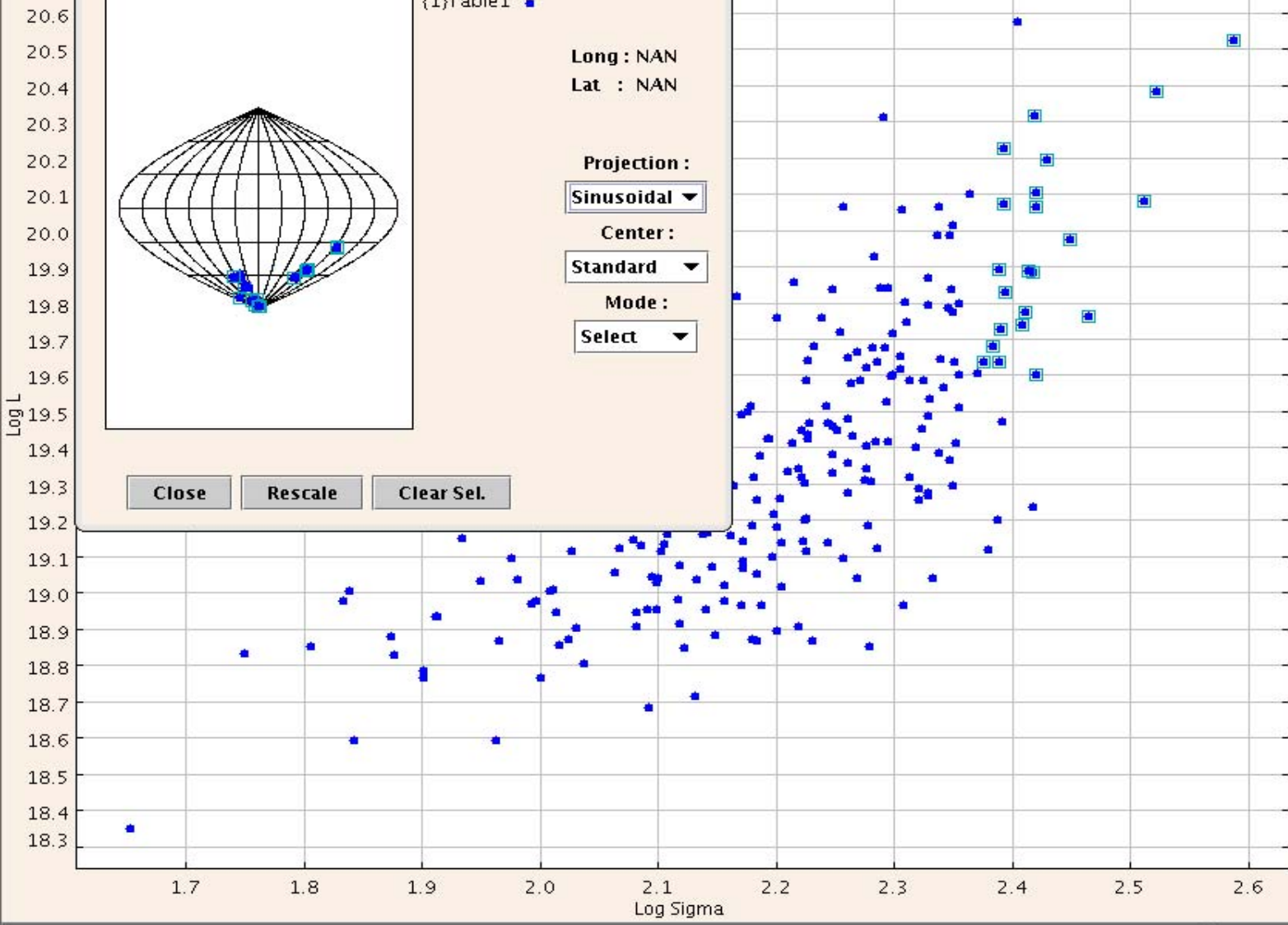
Mode :

Select

Close

Rescale

Clear Sel.



X : 1.94
Y : 19.15

VOTable

{1}Table1

Y : Log Rev

Log L

X : Log Rev

Log Sigma

Filter

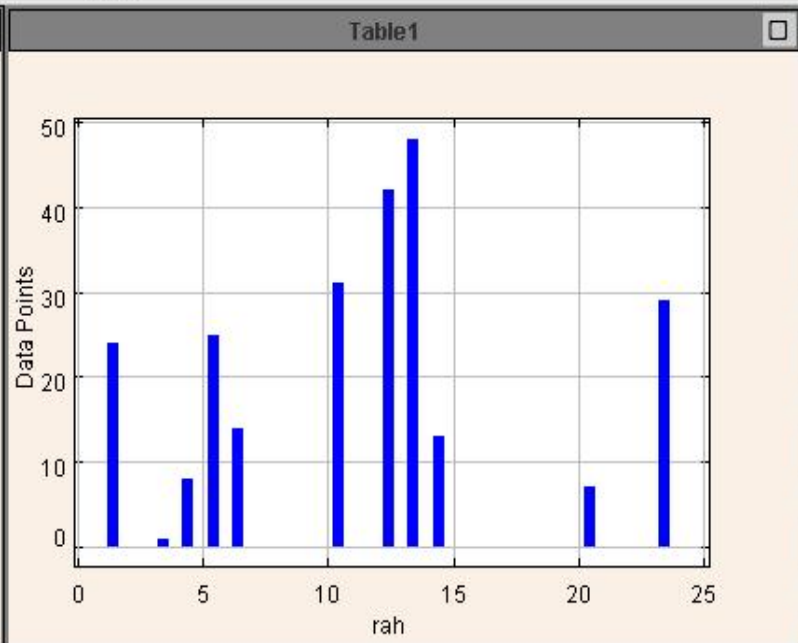
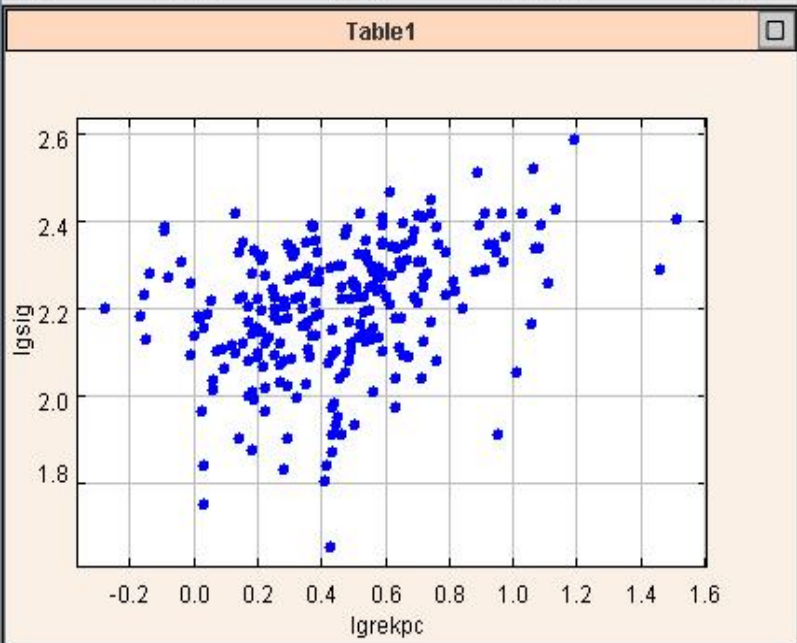
None

Overlay

Plot



Mode Select



X: 1.6
Y: 2.19

VOTable
{1}jorgensen_fp_r.txt

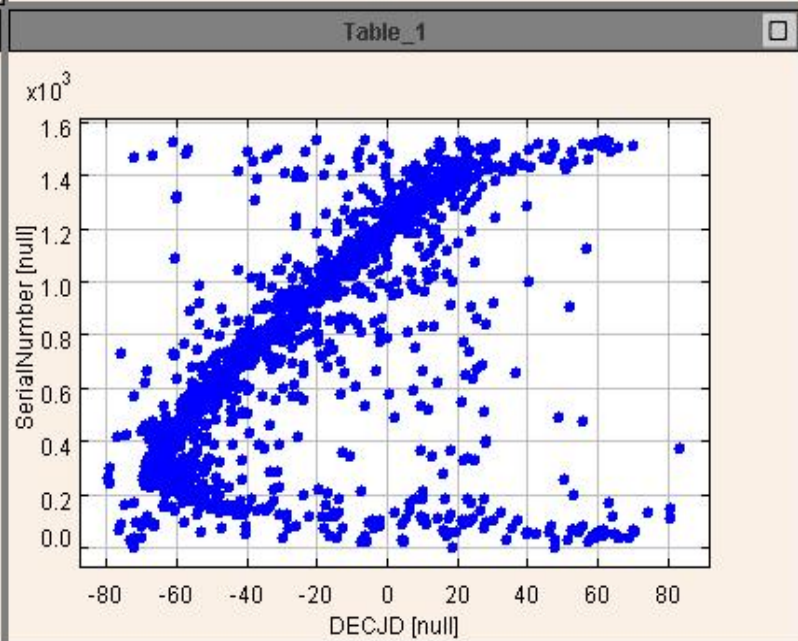
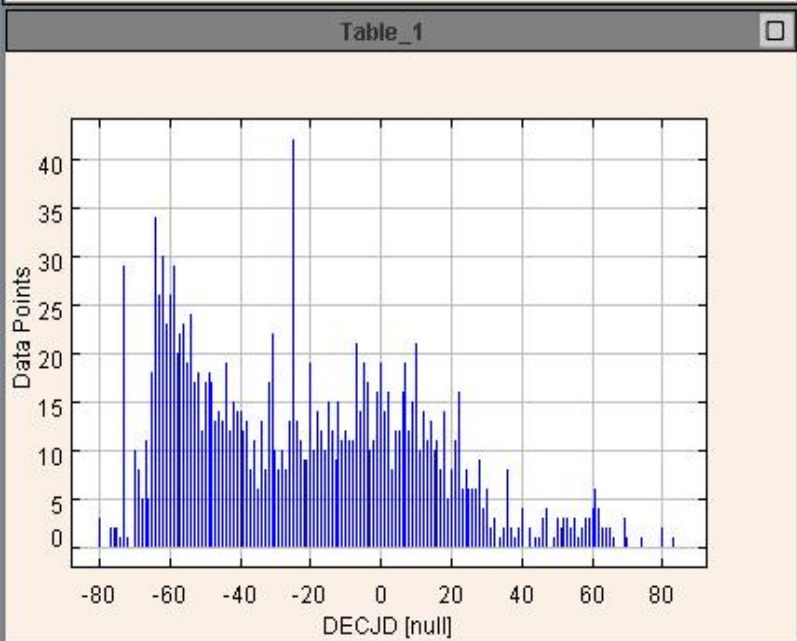
Resource
Resource1

Table
Table1

X: Log Rev
Igrekpc

Y: Log Rev
Igsig

Filter / Subset
None



Overlay

Same plot New plot

Plot

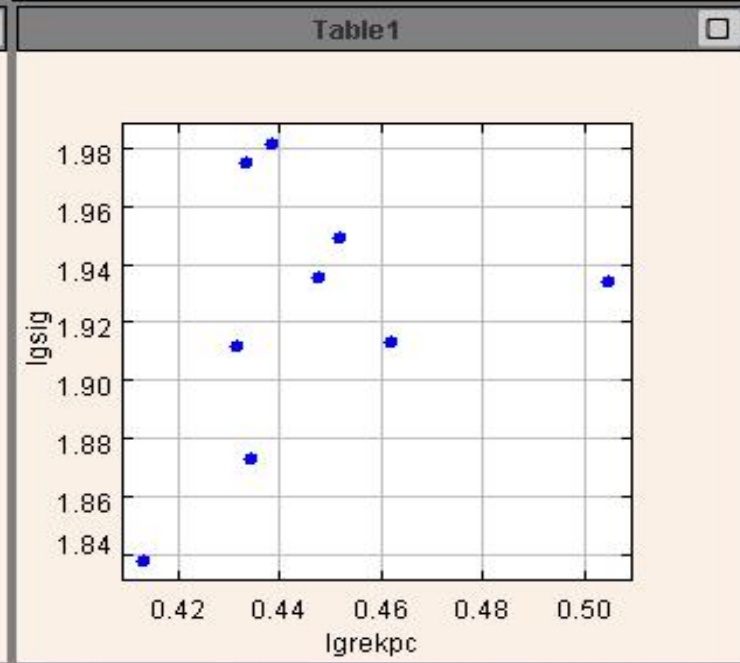
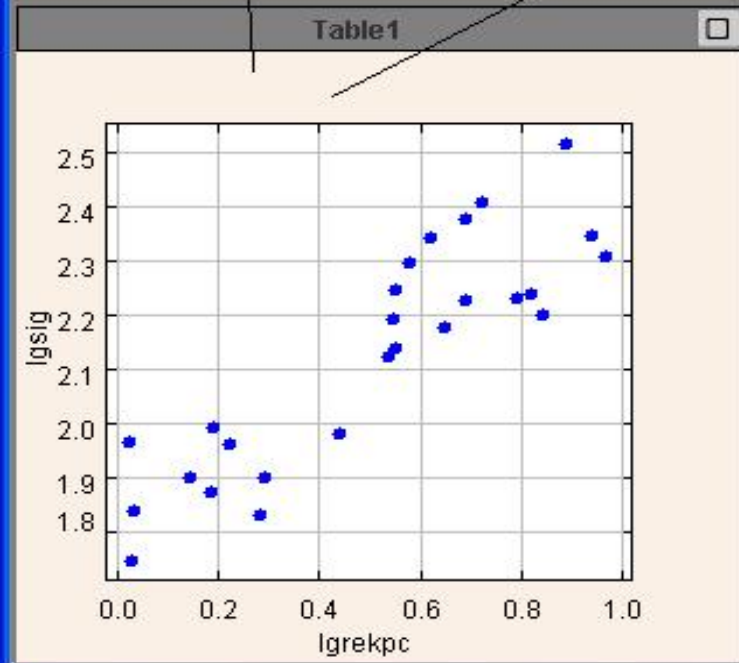
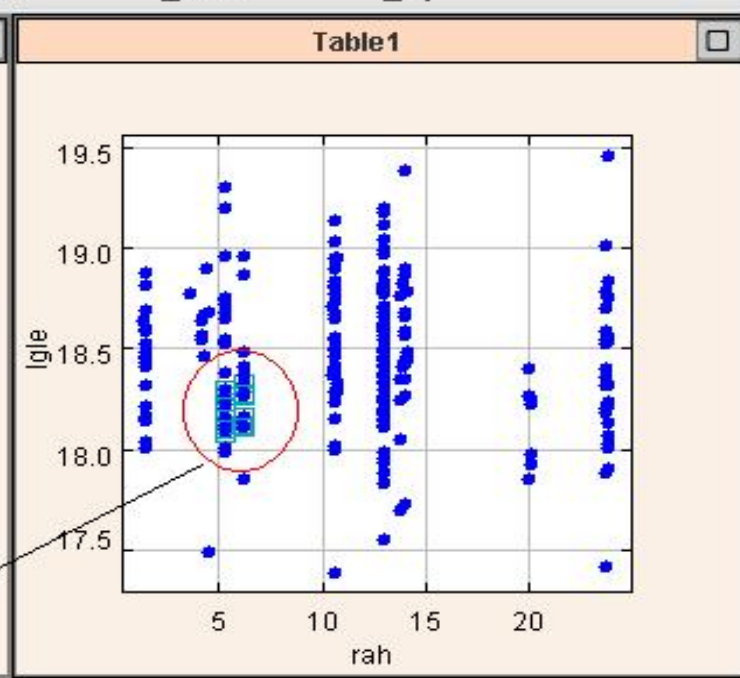
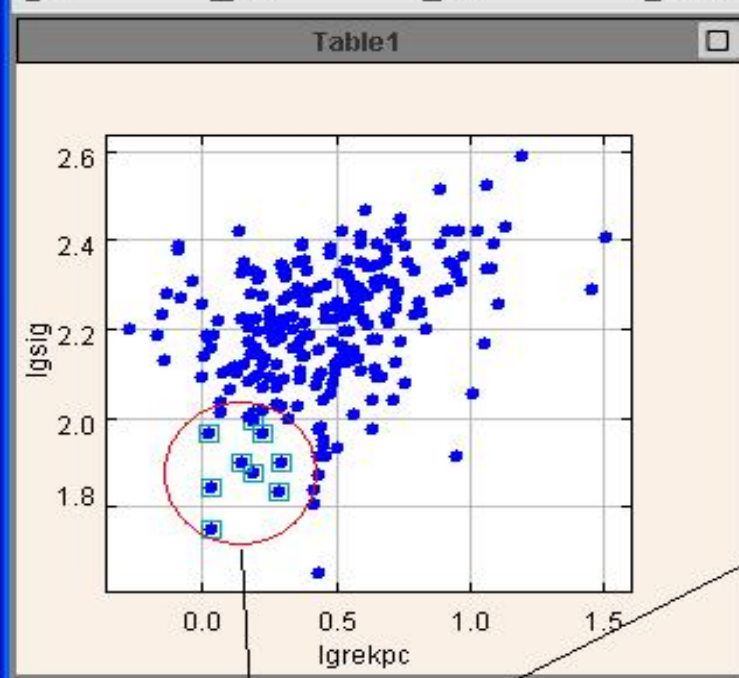
Histogram

Num of plots 2x2

Mode Select



File Mode View Functions Aladin Help



X: 21.4
Y: 17.52

VOTable
{1}jorgensen_fp_r.txt

Resource
Resource1

Table
Table1

X: Log Rev
rah

Y: Log Rev
lgle

Filter / Subset
None

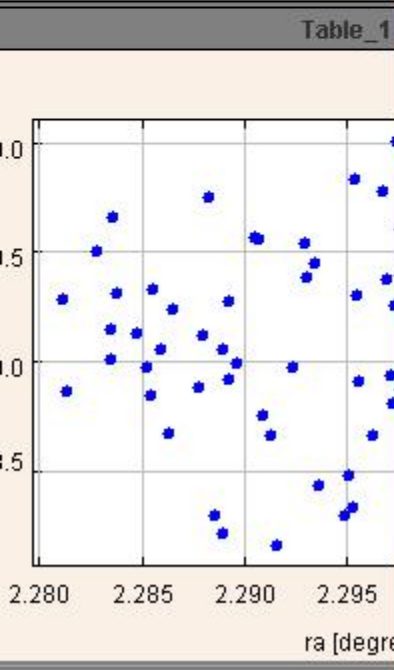
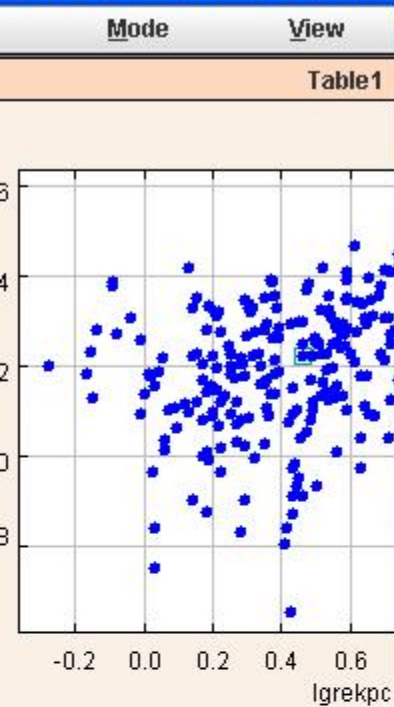
Overlay

Same plot New plot

Plot
Histogram

Num of plots 2x2

Mode Select



Aladin v4.0

ALADIN

Load... Save... Tools... Plugins... Print... Help... Quit

Position ICRS 21:38:38.36 -35:15:47.4 Pixel full 0.0

Skw EGRET (3D)

150 98.290 x 98.290

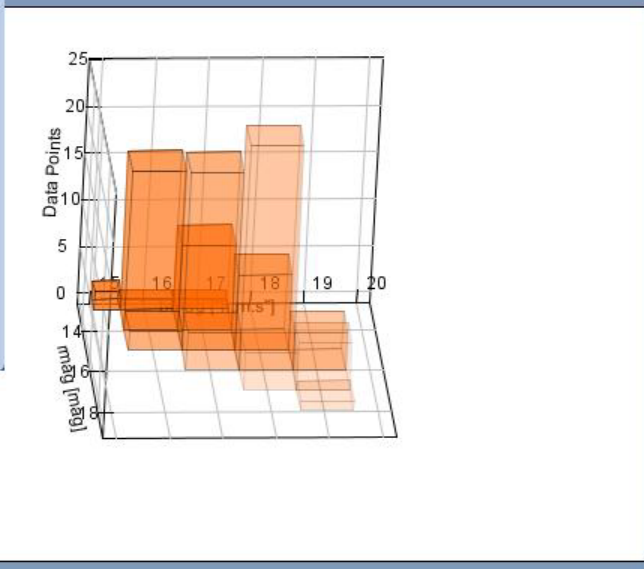
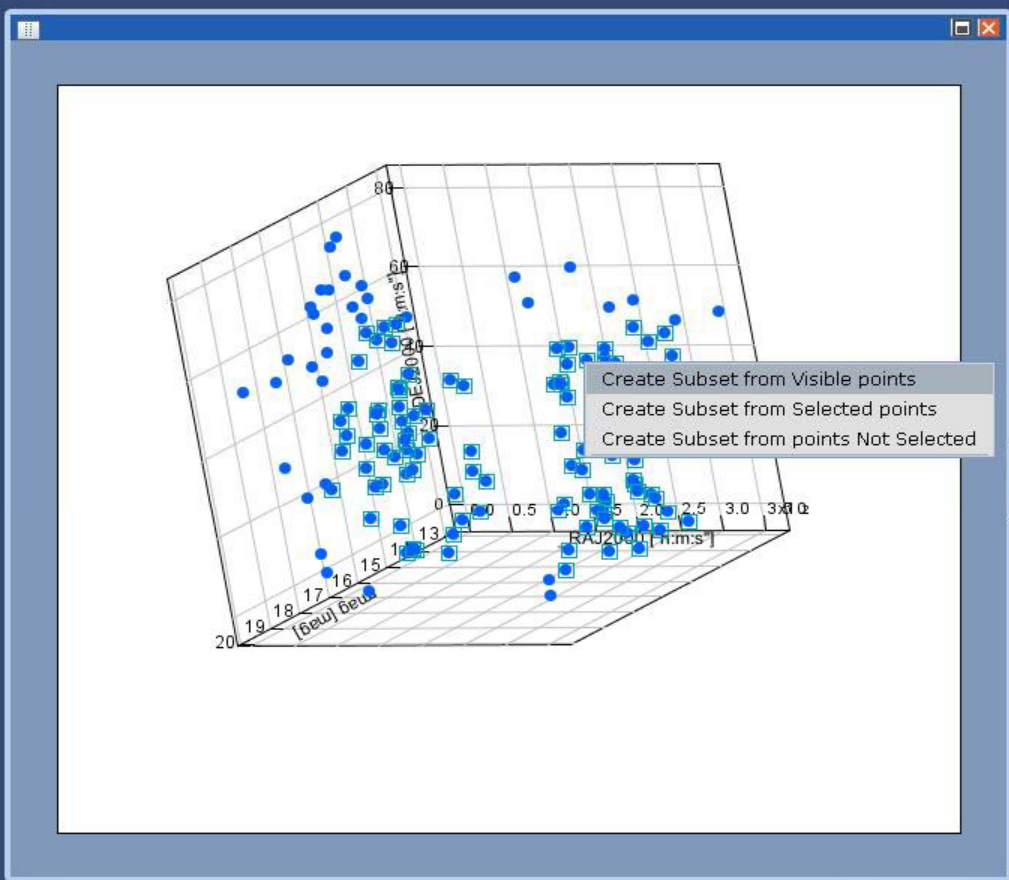
select pan zoom dist draw tag text filter rgb assoc tsamp cont mgls pixel prop del

VOApp Skw EGRET (3D)

150.00 x 150.00

multview - Skw EGRET (3D) - provided by HEASARC SkyView image server Zoom 2x

00 01 50.45 02 13 15.60 18.53 5.277 6.464 35



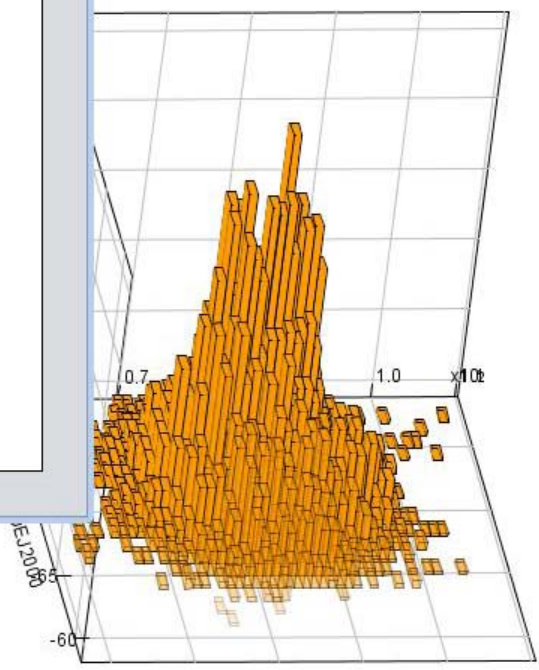
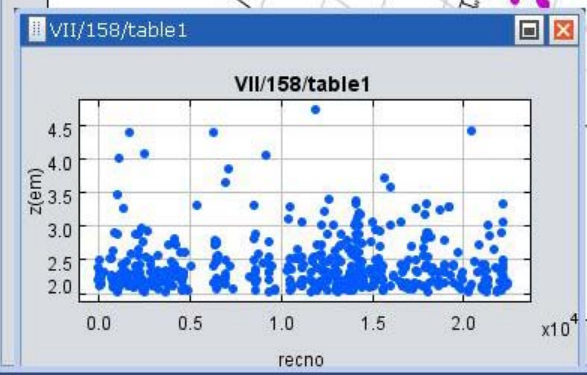
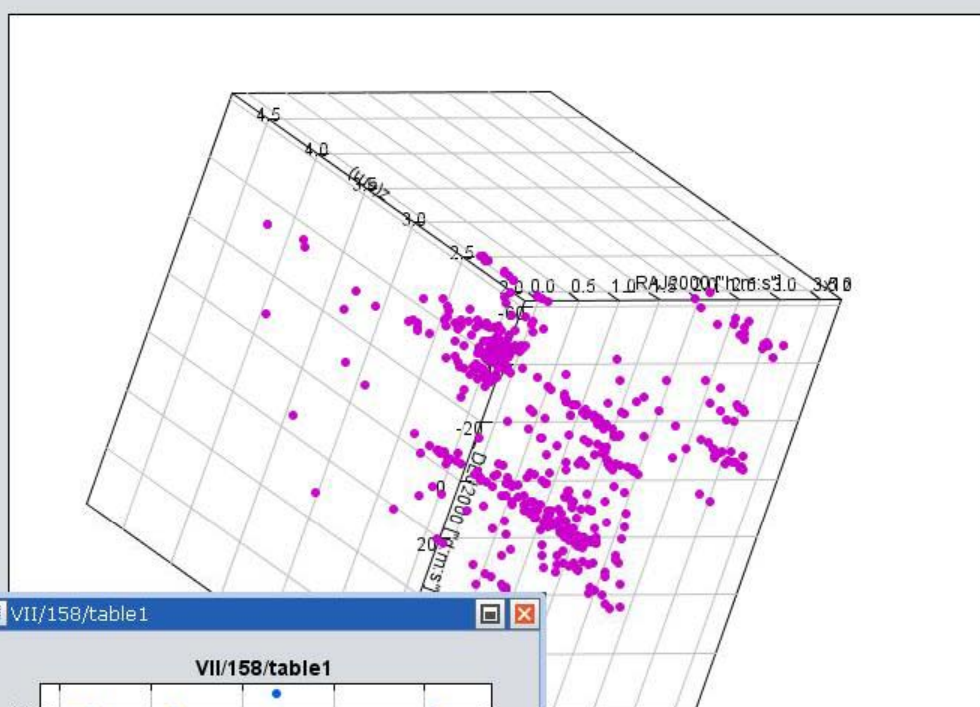
X : 4.97E1
Y : 85

VOTable
{1}DSS.xml

+
X : Log Rev
_RAJ2000
Y : Log Rev
_DEJ2000
Z : Log Rev
rmag
Filter / Subset
None

Overlay
 Same plot
 New plot

Plot
Histogram



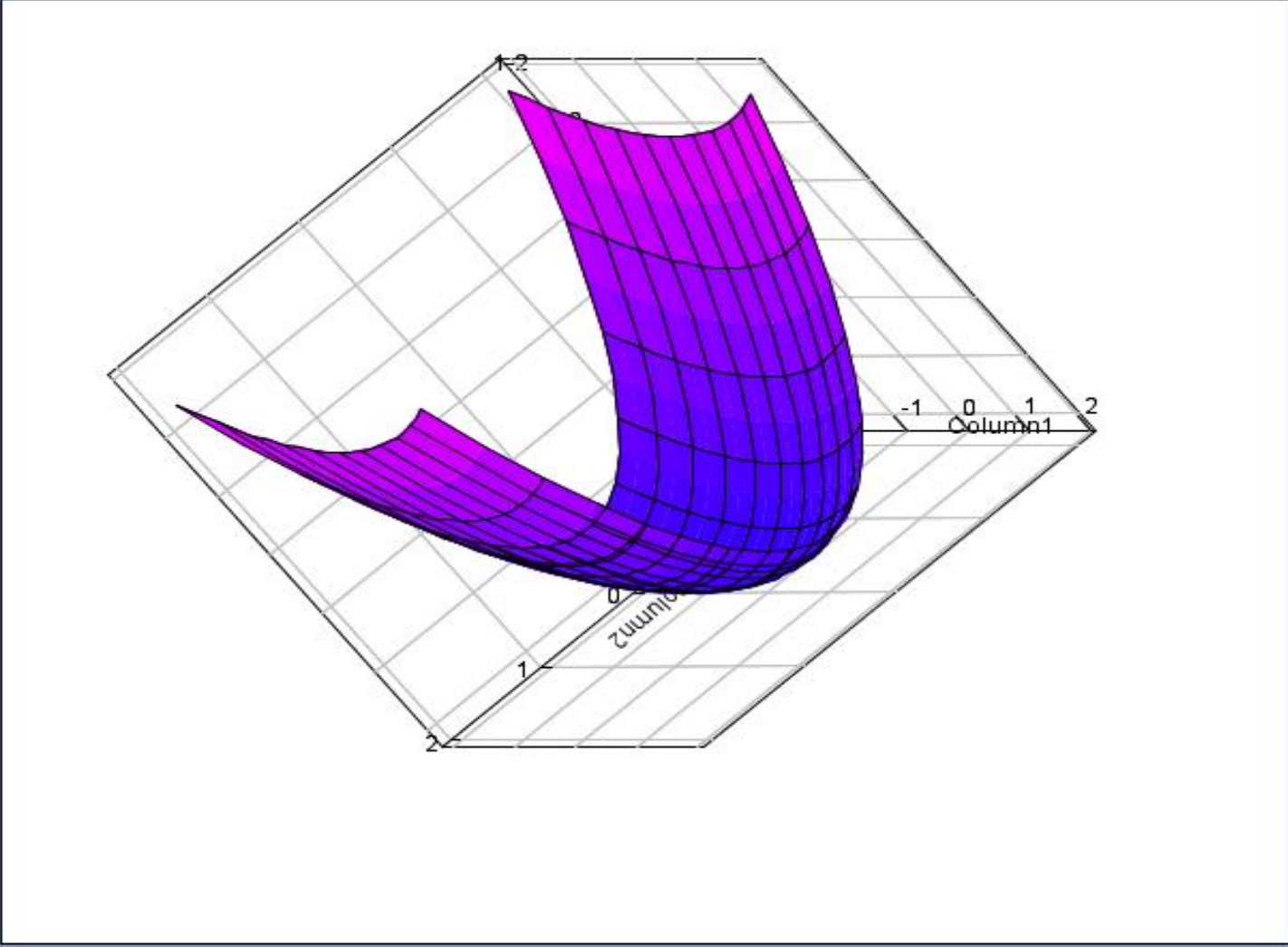
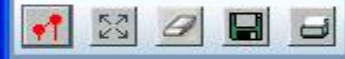
X : 2.25E4
Y : 2.41

VOTable
{1}Burbidge.xml

+
X : Log Rev
RAJ2000
Y : Log Rev
z(em)
Z : Log Rev
DEJ2000
Filter / Subset
None

Overlay
 Same plot
 New plot

Plot
Histogram



X:28.647889

Y:5.7295779

Z:0.2864788

VOTable

{5}paraboloid... ▾



X:

Column1 ▾

Z:

Column2 ▾

Y:

Column3 ▾

Filter

None ▾

Interpolation

BiLinear ▾

Smoothness

2 ▾

Mesh Line multiplier

1 ▾

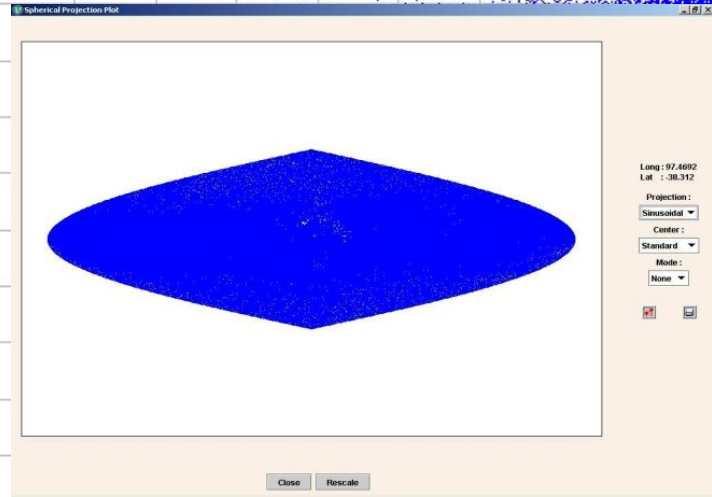
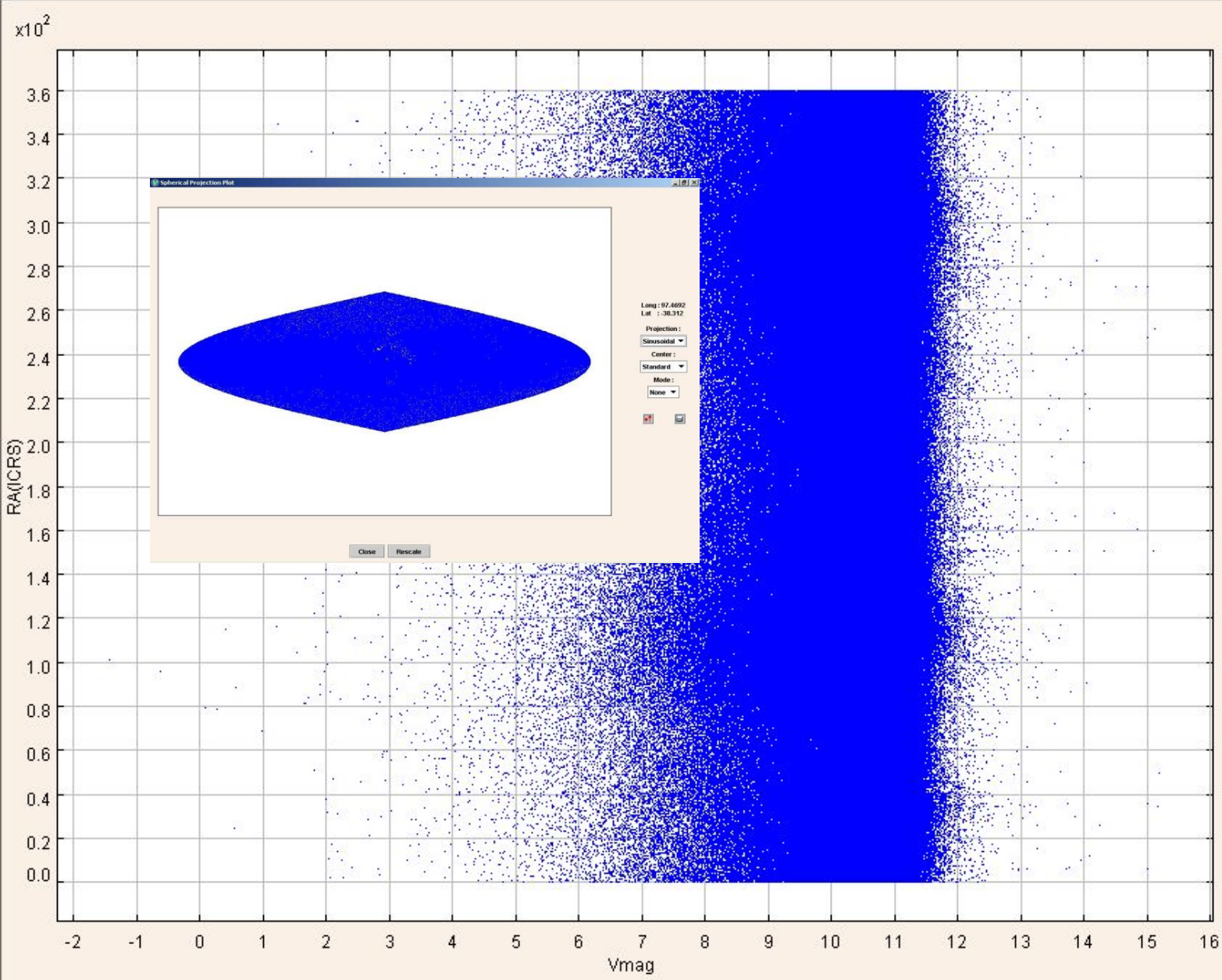
Overlay

Plot

Mode

Rotate ▾

Close



X: 13.8
Y: 1.36E2

VOTable
{1}VOTable1

Resource
{1}Resource1

Table
{1}Table1

Y: Log Rev
RA(ICRS)

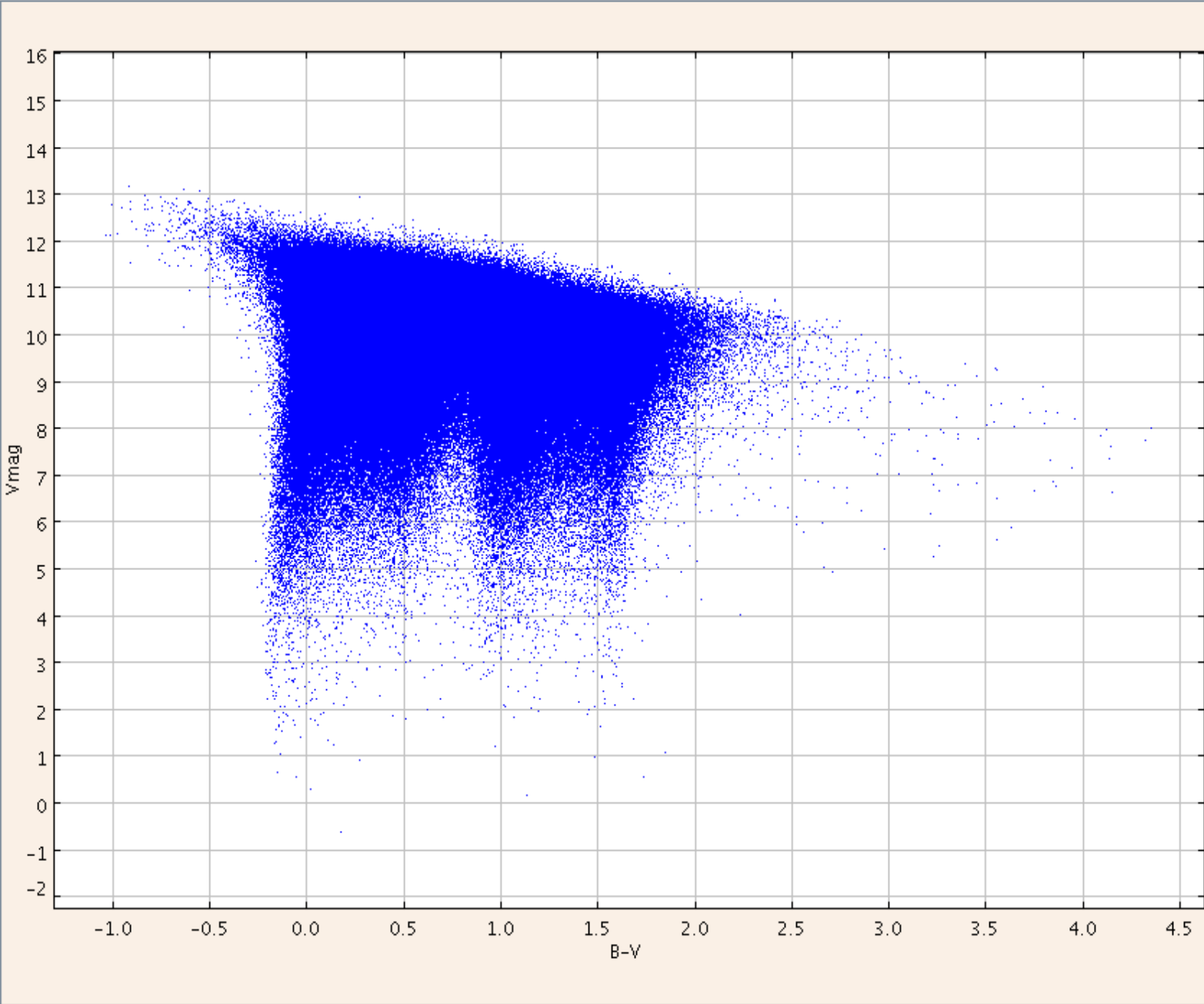
X: Log Rev
Vmag

Overlay

Plot



Mode None



X : 2.34
Y : 0

VOTable
{1}VOTable1

Resource
{1}Resource1

Table
{1}Table1

Y : Log Rev
Vmag

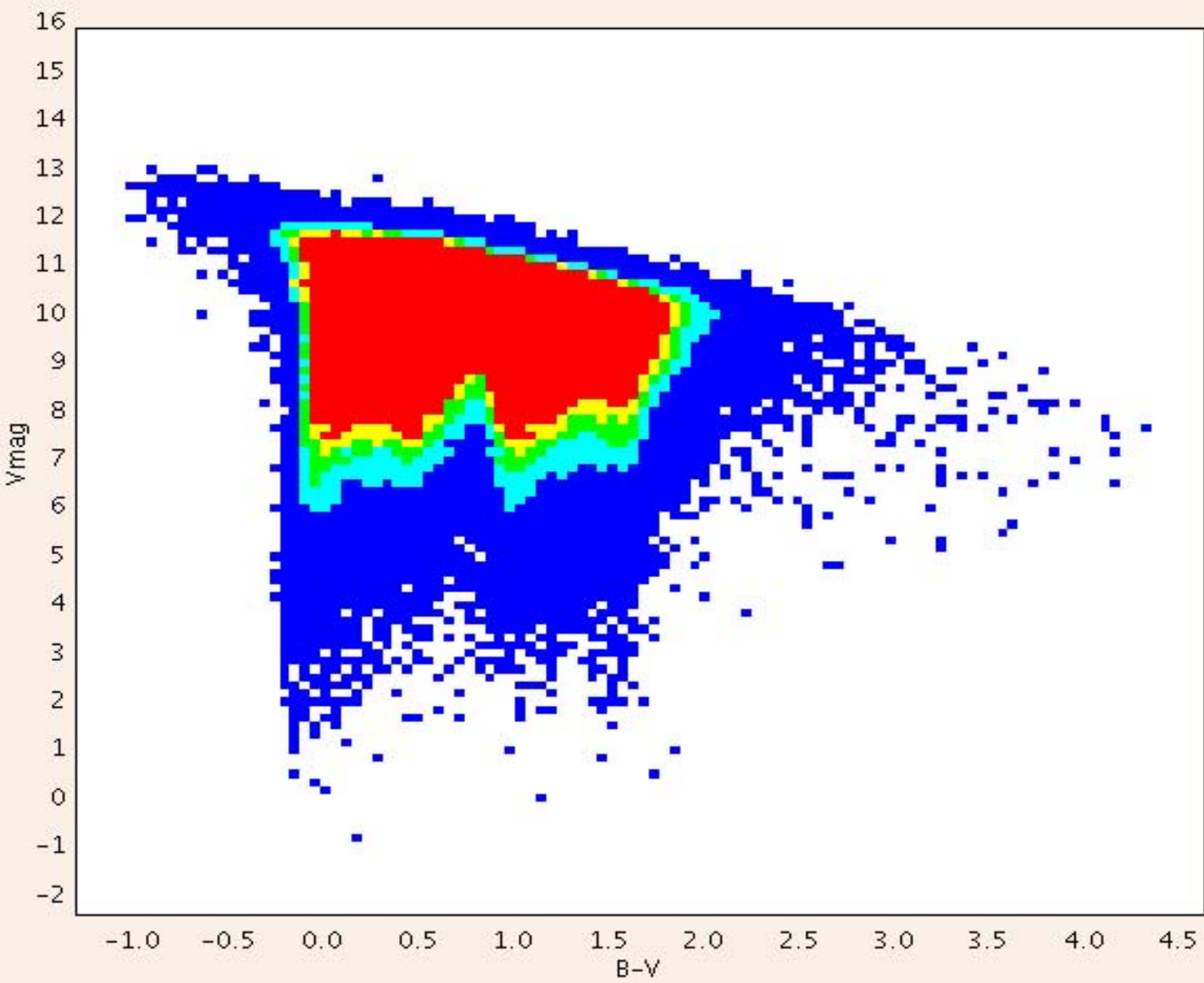
X : Log Rev
B-V

Overlay

Plot



Mode None



Cell Density	Total Count
1 - 59	17918
60 - 118	16529
119 - 177	15831
178 - 236	16359
237 - 8283	982941

X: Log

Y: Log

Mode



Close

Rescale



Test List



Help



View File



View Data



VO Plot



UPLOAD FILE/URL

File Type: ASCII VOTABLE

Type in a URL:

OR Choose a file:

Input file: **Burbidge.xml**

SELECT CATEGORY

Descriptive

Descriptive Statistics

- Mean Standard Deviation
- BoxPlot
- Histogram
- Weighted Mean
- Correlation Matrix

Tests

Exploratory Tools

ate

Curve Fitting

ation

metric

Two and k-sample
Tests

ds

sion

VOSTat

Statistical Analysis for the Virtual Observatory

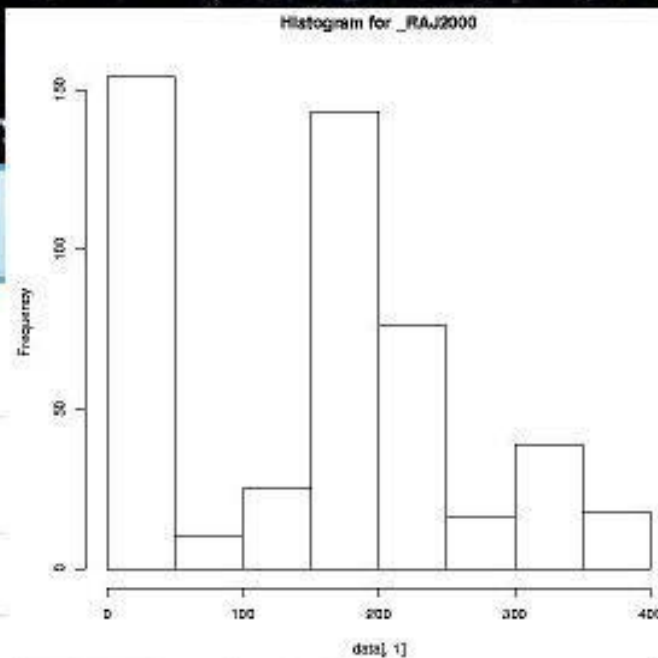
- R Code
- Plots
- Save
- Test List
- Help
- View File

MEAN STANDARD DEVIATION

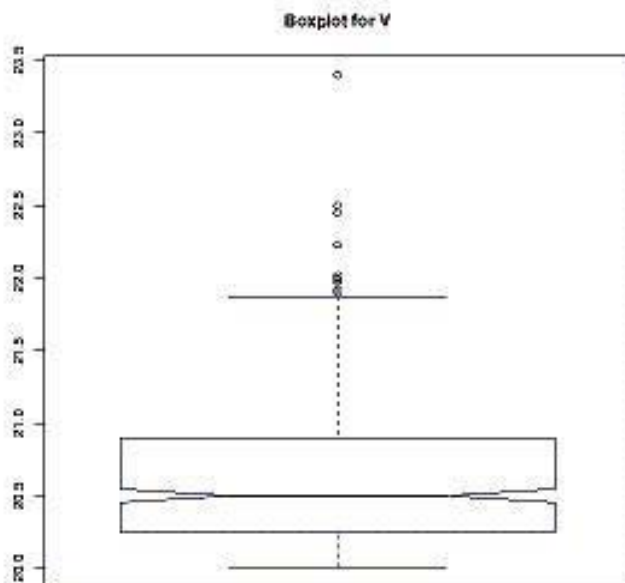
Column Names	Mean	Standard Deviation
_RAJ2000	154.4083	108.2551
_DEJ2000	0.4345911	0.2630965

V
z(em)

Developed by [VO-I](#)



Histogram	BoxPlot
_RAJ2000	_RAJ2000
_DEJ2000	_DEJ2000
V	V
z(em)	z(em)



0.44478

0.2475942

KOLMOGOROV SMIRNOV ONE SAMPLE TEST

Columnwise Transformations:

Select Column	x-val	log(x)	ln(x)	exp(x)
RAJ2000 ▼	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Coefficient :

0.01 ▼ (Confidence Coefficient)

<input checked="" type="radio"/> User Defined {Expression(CDF) should be in terms of 'x' only (e.g. '1-exp(-x))'} CDF : <input style="width: 150px;" type="text" value="x"/> Upper Limit: <input style="width: 50px;" type="text" value="Inf"/> Lower Limit: <input style="width: 50px;" type="text" value="0"/>	<input type="radio"/> Library (Refer table below) Distribution : ▼ Gaussian ▼ Argument 1 : <input style="width: 50px;" type="text" value="1"/> Argument 2 : <input style="width: 50px;" type="text" value="1"/>
---	--

Plot Format:

PostScript
 JPEG
 PDF
 PNG

Submit

For Distributions Refer table:

Distribution	Argument 1	Argument 2	Expression
Gaussian	μ : mean	σ : standard deviation(+ve)	$f(x) = \frac{e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}}{\sqrt{2\pi}\sigma}$ $-\infty < x < \infty; \quad \sigma > 0$ $-\infty < \mu < \infty;$
Cauchy	t : Location	s : scale(+ve)	$f(x) = \frac{1}{s\pi(1 + ((x-t)/s)^2)}$ $-\infty < x < \infty; \quad s > 0$ $-\infty < t < \infty;$

KOLMOGOROV SMIRNOV ONE SAMPLE TEST

Mean: 1
Standard Deviation: 1
Distribution: Gaussian
Rname: pnorm

[Click here to view Plot](#)

One-sample Kolmogorov-Smirnov test

data: x

D = 1, p-value < 2.2e-16

alternative hypothesis: two.sided

Dmax:

\$Statistic

D

1

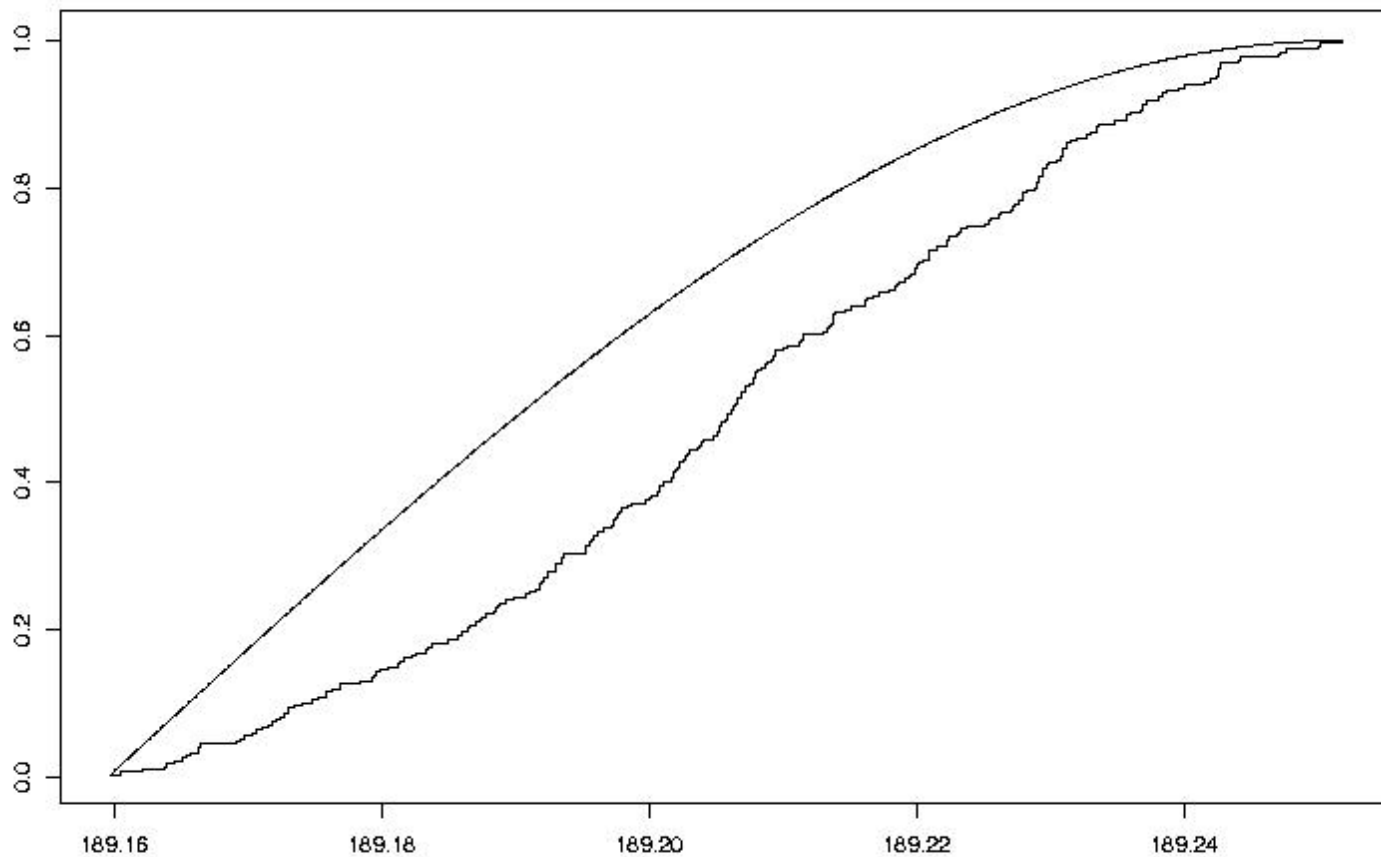
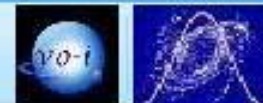


Table value:

0.09919864

As D > table value 'Test is significant'



RESULT

K-MEANS PARTITIONING

[Click here to view Plot](#)

sizes :

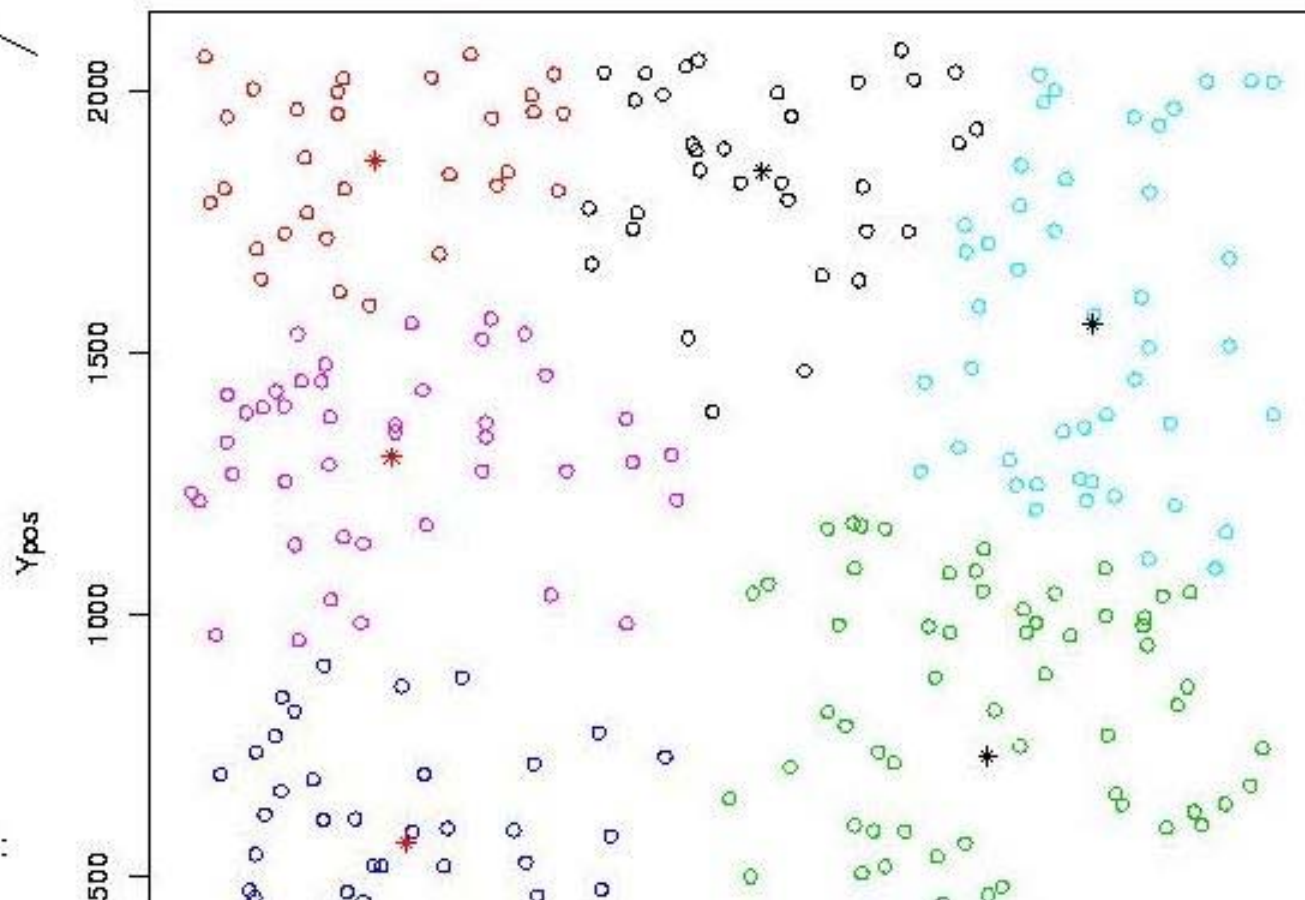
33 30 73 42 46 42

centers :

	Xpos	Ypos
1	1186.9091	1846.9091
2	514.2000	1866.8000
3	1578.8219	730.3562
4	568.3333	565.4286
5	1760.1304	1554.7174
6	542.5000	1301.9048

withinss :

2292505 1764038 10275335 35:





K-MEANS PARTITIONING

[Click here to view Plot](#)

sizes :
 1 1 2 1 2

centers :

	X_RAJ2000	X_DEJ2000	V	z_em
1	331.51125	0.49167731	22.000	4.3990
2	47.46354	0.04260093	20.390	4.3730
3	12.84379	0.47298542	20.850	4.2015
4	15.90571	0.50249398	20.100	4.0730
5	159.40569	0.85446528	20.575	4.3865

withinss :
 0.000000 0.000000 1.359220

clusters :
 1 2 3 4 5 6 7
 3 3 4 2 5 5 1

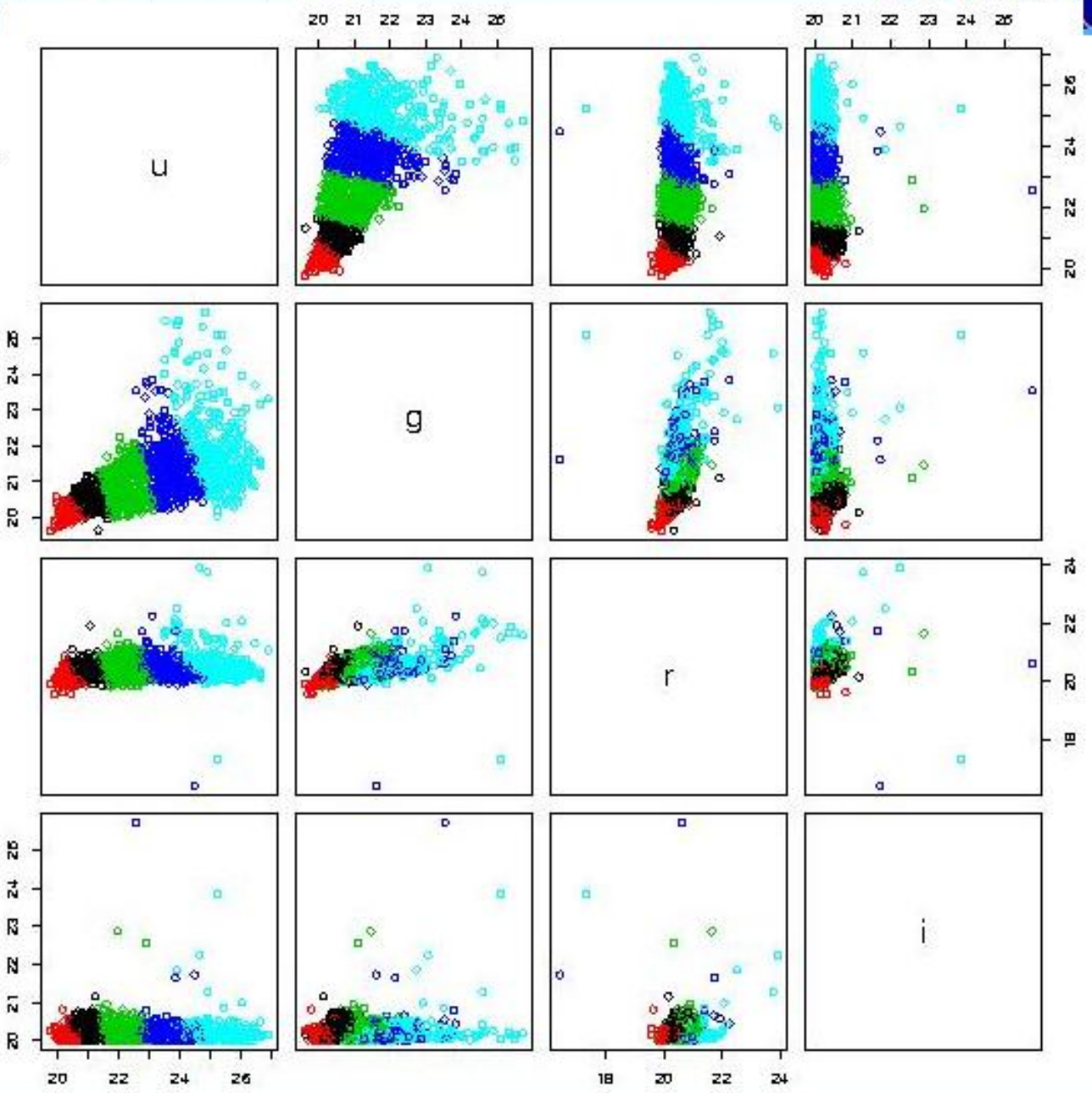


Image Cutout System

Swarp (Emmanuel Bertin)

2m44s,10d23m43s (or)

Basic [Clear Markers](#)
Center of cutout rectangle and
width

Clicking at two points

RA: 47.11593
DEC: 47.25966

39612



- SDSS Ultraviolet(u)
- SDSS Green(g)
- SDSS Red(r)
- SDSS Near Infrared(i)
- SDSS Infrared(z)**

ra_m51

[this page](#)



RA
DEC



Note:

1. The status shown for a job in the Jobs Table might not match the job status as inferred from the tasks table.
The status changes in this order QUEUED -> RUNNING -> COMPLETED / FAILED
2. Our system will automatically delete the jobs older than 30 days.
3. Anonymous jobs submitted by an individual can be viewed by any user. If you want to keep your job private, please submit a job after login into the system.

List of submitted jobs

<< 1 **2** >>

RequestID ▾	Status	Time	Label
130	RUNNING	Tue Sep 22 15:21:27 GMT+05:30 2009	red_infra_m51_form
129	COMPLETED	Tue Sep 22 15:11:23 GMT+05:30 2009	UV_infra_m51_form
128	COMPLETED	Tue Sep 22 15:11:15 GMT+05:30 2009	green_infra_m51_form
127	COMPLETED	Tue Sep 22 15:11:02 GMT+05:30 2009	near_infra_m51_form

<< 1 **2** >>

Get the task information for the jobs submitted anonymously



Note:

1. The status shown for a job in the Jobs Table might not match the job status as inferred from the tasks table.
The status changes in this order QUEUED -> RUNNING -> COMPLETED / FAILED
2. Our system will automatically delete the jobs older than 30 days.
3. Anonymous jobs submitted by an individual can be viewed by any user. If you want to keep your job private, please submit a job after login into the system.

List of submitted jobs

<< 1 2 >>


RequestID ▾	Status	Time	Label
130	RUNNING	Tue Sep 22 15:21:27 GMT+05:30 2009	red_infra_m51_form
129	COMPLETED	Tue Sep 22 15:11:23 GMT+05:30 2009	UV_infra_m51_form
128	COMPLETED	Tue Sep 22 15:11:15 GMT+05:30 2009	green_infra_m51_form
127	COMPLETED	Tue Sep 22 15:11:02 GMT+05:30 2009	near_infra_m51_form

<< 1 2 >>

Get the task information for the jobs submitted anonymously



OBJECT:


SIMBAD NED 

RA (J2000): degrees ▾

DEC (J2000): degrees ▾

WIDTH (RA): degree ▾

WIDTH (DEC): degree ▾

SCALE (arc-sec/pixel): 

Cutout Services:
 SDSS Ultraviolet(u)
 SDSS Green(g)
 SDSS Red(r)
 SDSS Near Infrared(i)
 SDSS Infrared(z)

Label:

Note:
HMS/DMS format of RA/Dec is supported in following three ways

1. Colon separated value. For example RA=19:17:32, DEC=11:58:02
2. Spaces separated value. For example RA=19 17 32, DEC=11 58 02
3. HMS/DMS string. For example RA=19h17m32s, DEC=11d58m02s

Enter the List


Note: Ra, dec can only be in degrees. HMS format is not allowed

Format: objName, ra, dec, width (RA), width (DEC)
Example: M51,202.4682083,47.1946667,0.4,0.4

File Upload

Note: You can either type a file URL (can be http, https or ftp) in below textbox or alternatively you can browse to some local file by 'select' button.











Cutout Services:
 SDSS Ultraviolet(u)
 SDSS Green(g)
 SDSS Red(r)
 SDSS Near Infrared(i)
 SDSS Infrared(z)

SCALE (arc-sec/pixel): 

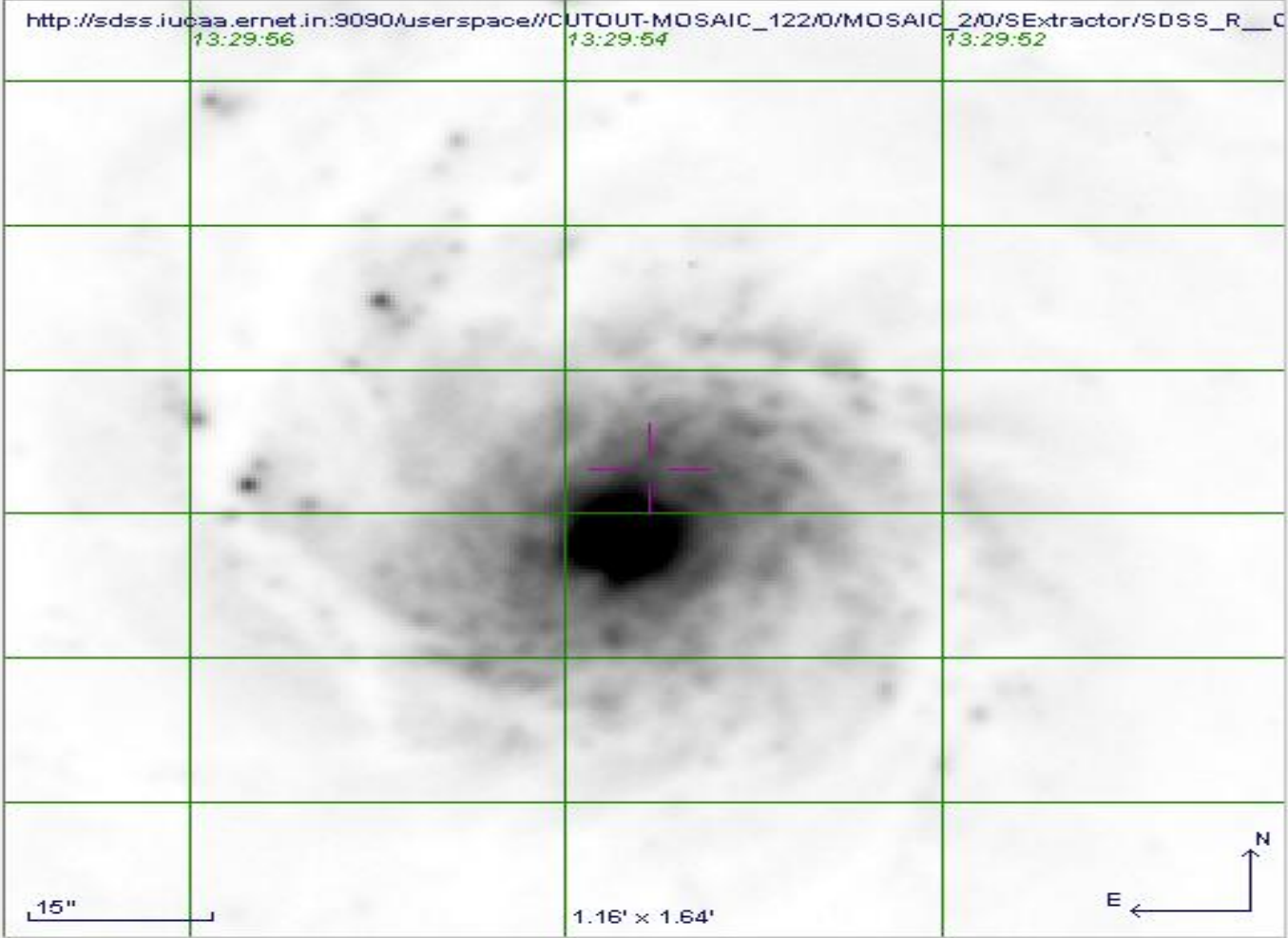
Label:



Note: To download the output fits file or image ,right click on the output link and click save as option

Task	State	Input	Output
Set#0			
CUTOUT	COMPLETED	<p>OBJECT NAME M51</p> <p>RA 202.48220 degree</p> <p>DEC 47.23150 degree</p> <p>WIDTH_RA 0.2 degree</p> <p>WIDTH_DEC 0.2 degree</p> <p>SCALE 0.39612 arc-sec/pixel</p>	<p>SDSS_R</p> <ul style="list-style-type: none"> ▢ Cutout png images <ul style="list-style-type: none"> ▪ 1 ▪ 2 ▪ 3 ▪ 4 ▪ 5 ▪ 6 ▢ Cutout Fits Files <ul style="list-style-type: none"> ▪ 1  ▪ 2  ▪ 3  ▪ 4  ▪ 5  ▪ 6  ▪ Load All Images
MOSAIC	COMPLETED		<p>SDSS_R</p> <ul style="list-style-type: none"> ▢ Swarp output <ul style="list-style-type: none"> ▪ fits ▪  ▪ png ▪ log ▢ SExtractor output <ul style="list-style-type: none"> ▪ fits ▪  ▪ png ▪ catalog <p>Output Zip </p> 

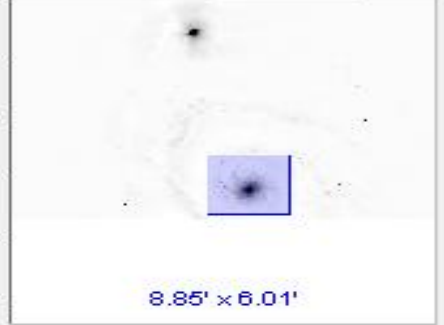
Location **13:29:52.65 +47:12:16.2** ICRS Pixel **16.062** full



- select
- pan
- zoom
- dist
- draw
- tag
- text
- filter
- cross
- rgb
- assoc
- cont
- mgls
- pixel
- prop
- del

<http://sdss.iucaa.ernet.in>

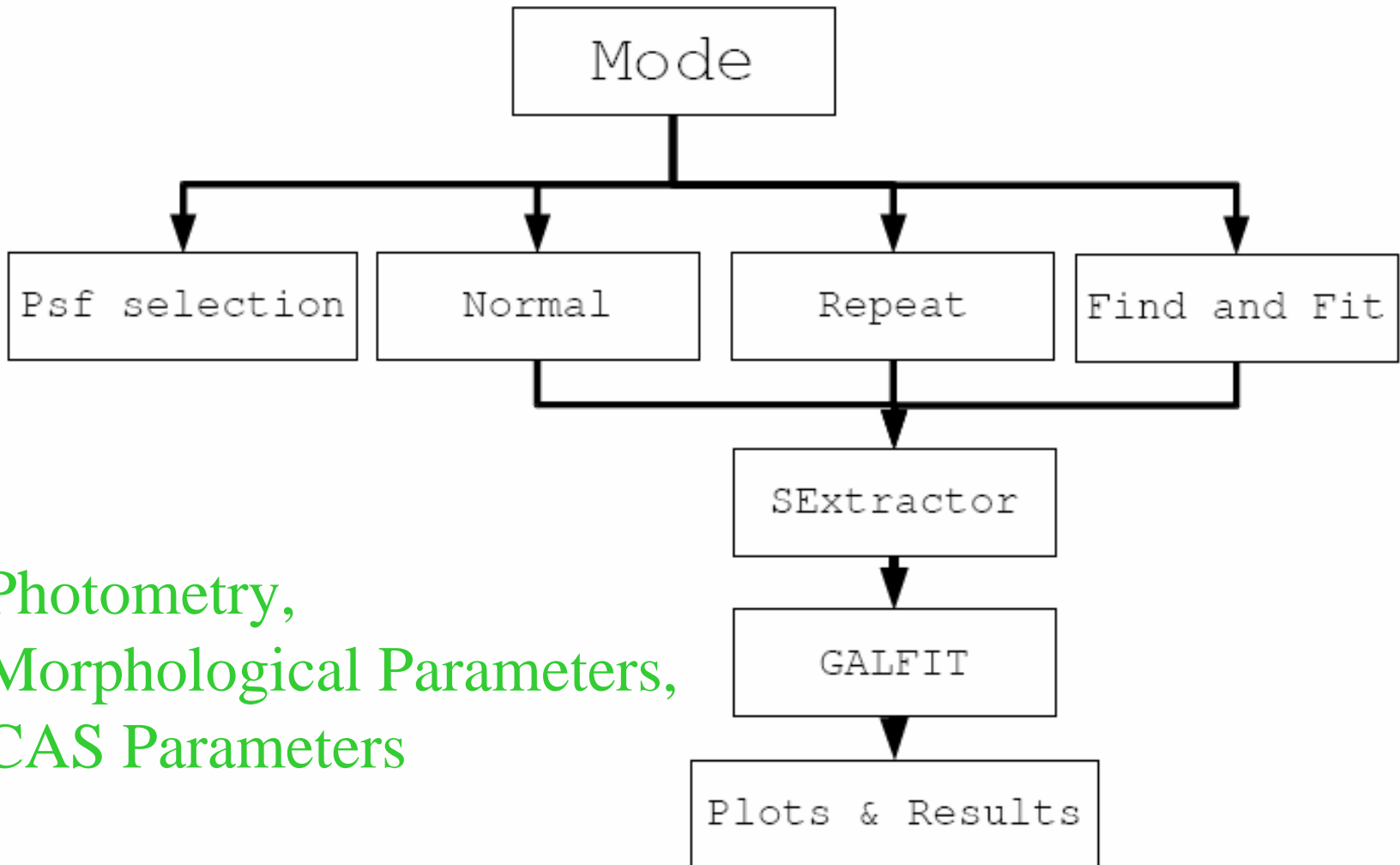
Zoom 2x



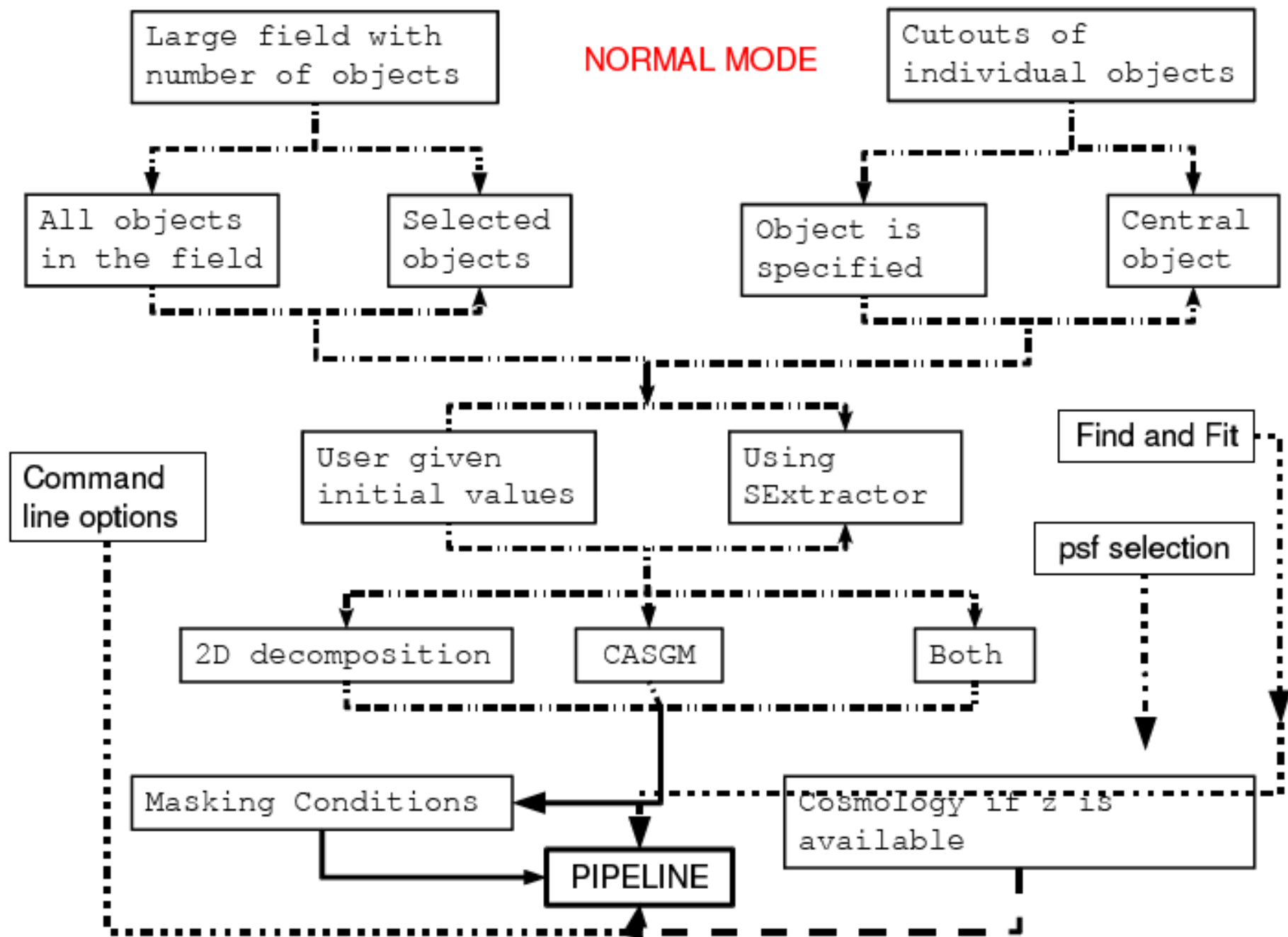
grid multiview match

Search

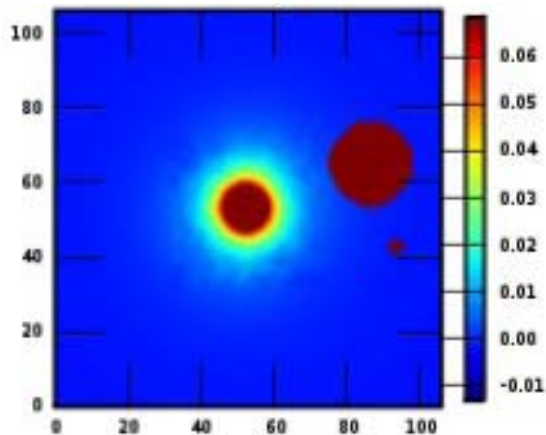
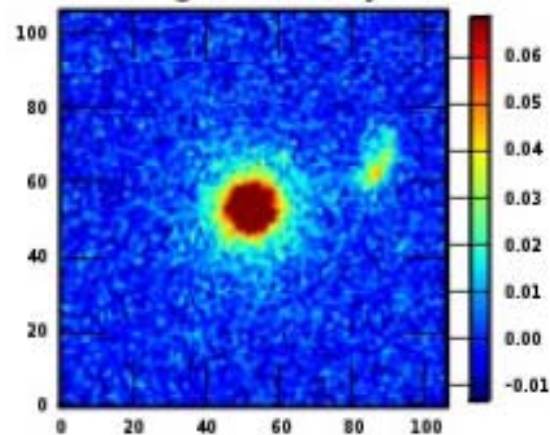
PyMorph Pipeline



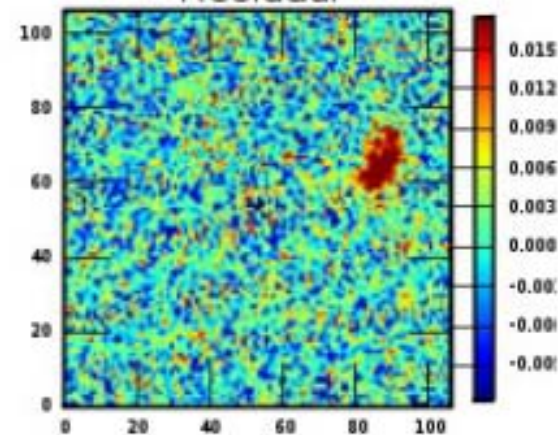
Photometry,
Morphological Parameters,
CAS Parameters



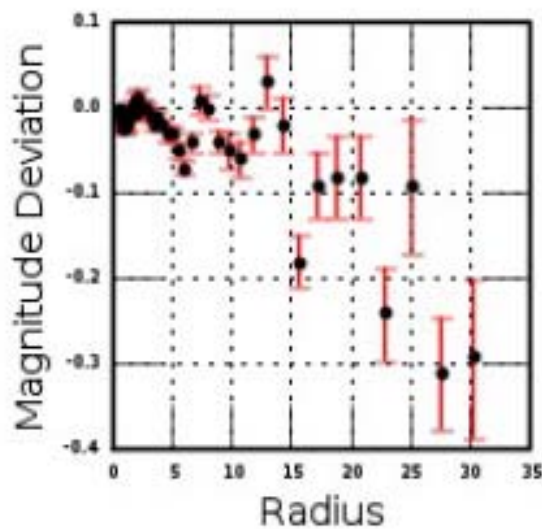
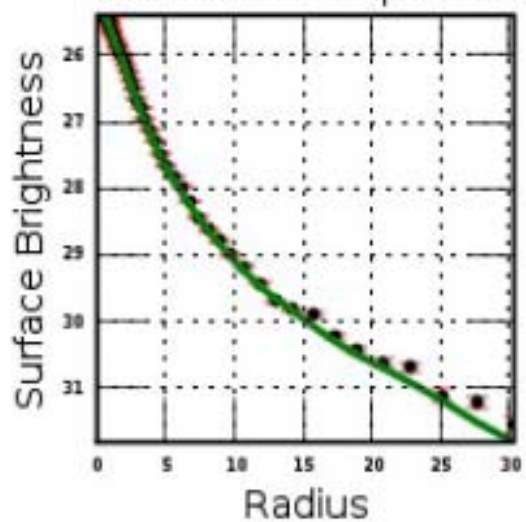
Original Galaxy



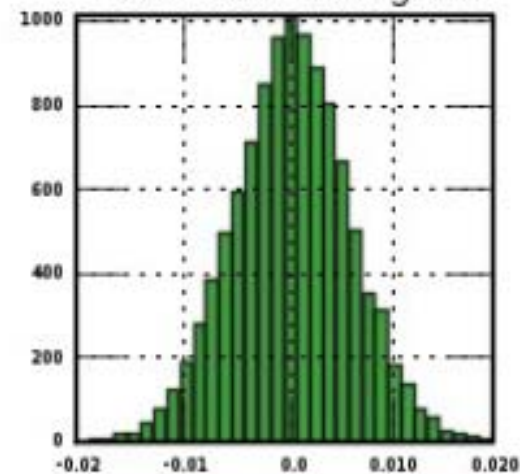
Residual



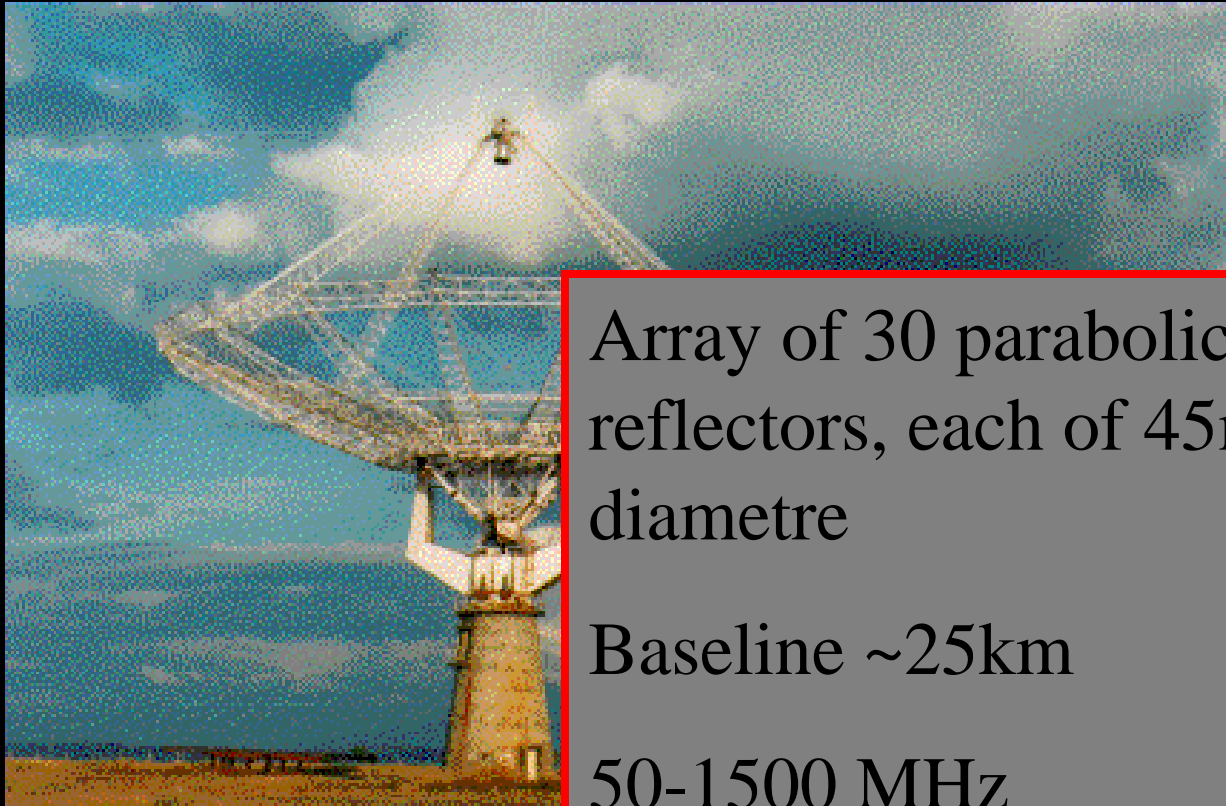
1-D Profile Comparison



Difference Histogram



Giant Metrewave Radio Telescope



Array of 30 parabolic reflectors, each of 45m diameter

Baseline ~25km

50-1500 MHz

GMRT, Narayangaon
TIFR

NCRA Archive and Proposal System

[Home](#)[Proposer](#)[TAC Member](#)[Chair Person](#)[Administrator](#)[Create Cycle](#) | [Edit Cycle Info](#) | [Set Cycle Categories](#) | [Set DDT Committee](#) | [User Administration](#)

Create New Cycle

Cycle Id :

Submission Date

Start:



End:



Review Date

Start:



End:



Negotiation Date

Start:



End:



Chairperson

[Search](#)

Secretary

[Search](#)

Scheduler

[Search](#)

Scheduling Method

Attachments Dir

Assign TAC Members

TAC Members

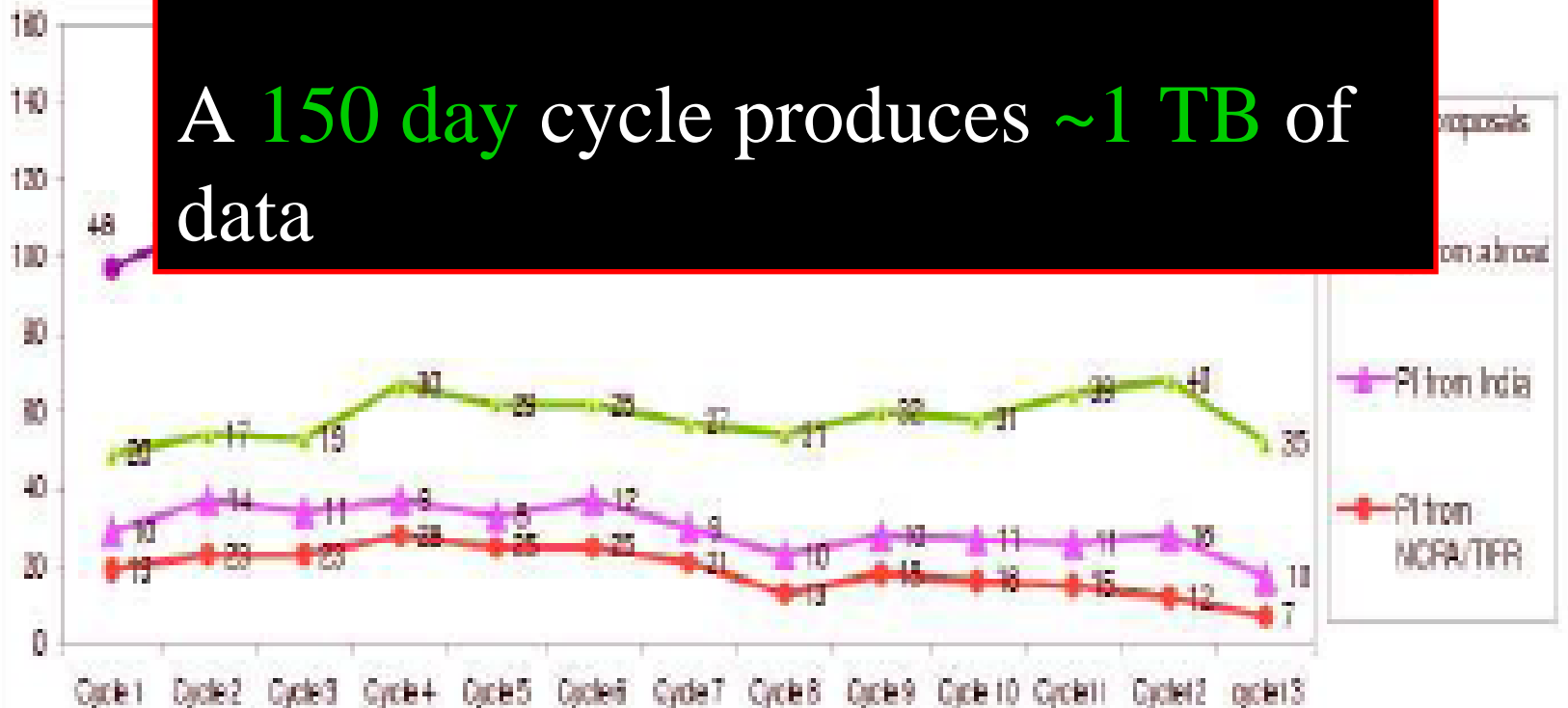
Other Users

Statistics of PI -Cycle 1 to 13

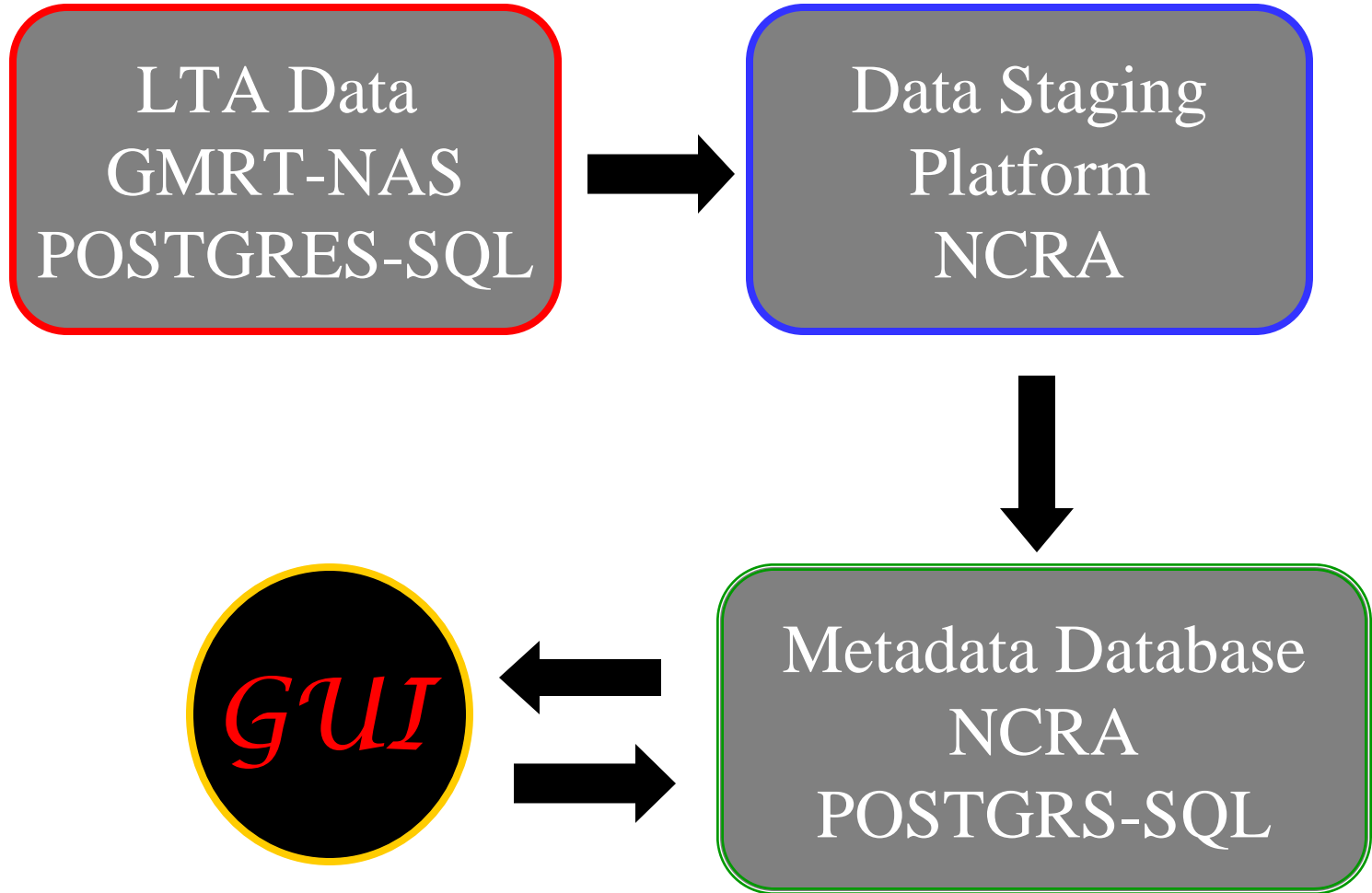
Category	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6	Cycle 7	Cycle 8	Cycle 9	Cycle 10	Cycle 11	Cycle 12	Cycle 13
NCRA/TIFR												12	7
PI from India												18	10
PI from abroad												40	35
All proposals												58	52

An 8 hour observation produces a Long Term Accumulation format file of size 1.5-2.5 GB

A 150 day cycle produces ~1 TB of data



Data Storage and Access



GMRT Archive Interface



PROPOSAL INFORMATION

Principal Investigator

Proposal Number

Scientific Category

(For multiple selection hold ctrl and click)

- any
- cosmology
- active galaxeis, cosmology
- active galaxies
- Active galaxies
- Active Galaxies
- active galaxies, cosmology
- Active galaxies, Cosmology
- AG

Observation Type

(For multiple selection hold ctrl and click)

- any
- imaging
- point source

Proposal Title

Time Allocated

Less Than (hrs)

More Than (hrs)

Between and (hrs)

Frequency Band

OBSERVATION PARAMETERS

Observation Number

Observer

Observation Date

Start date

End date

OBSERVATION PARAMETERS

Observation Number

Observer

Observation Date Start date

End date

SCAN PARAMETERS

Source Name

Source Co-ordinates RA (hh mm ss.s)
DEC (dd mm ss.s) (J2000)

Search Radius (arcmin)

Frequency Band

Frequency Value Less Than (MHz)
 More Than (MHz)
 Between and (MHz)

Channel Spacing

Time On source Less Than (Hrs.)
 More Than (Hrs.)
 Between and (Hrs.)



GMRT Archive Interface

Scan Parameters :: RA: 13 29 52.37 DEC: 47 11 40.80 Radius: 60

Showing page 1 of 1. Total records: 9

<< first < prev 1 next > last >>

All ▾

Observation No	RA 2000	DEC 2000	Time on src	Frequency1 (MHz)	Frequency2 (MHz)	Channel Width	Observation Date	Google Map Link
506	202.47503420698308	47.19212716218636	4528	1390.0	1390.0	125.0	08-Apr-2002	Sky Map
506	202.47503420698308	47.19212716218636	2129	1390.0	1390.0	125.0	08-Apr-2002	Sky Map
1899	202.43040079474235	47.19298659887906	7176	614.0	244.0	125.0	20-Feb-2005	Sky Map
1899	202.43040079474235	47.19298659887906	7208	614.0	244.0	125.0	20-Feb-2005	Sky Map
1926	202.43040079474235	47.19298659887906	8147	325.0	325.0	125.0	03-Mar-2005	Sky Map
1926	202.43040079474235	47.19298659887906	8163	325.0	325.0	125.0	03-Mar-2005	Sky Map
2874	202.46959110792932	47.19527843005958	50541	614.0	245.0	125.0	10-Nov-2006	Sky Map
2888	202.46959110792932	47.19527843005958	55994	614.0	244.0	125.0	20-Nov-2006	Sky Map
2900	202.46959110792932	47.19527843005958	42874	325.0	325.0	125.0	26-Nov-2006	Sky Map

<< first < prev 1 next > last >>

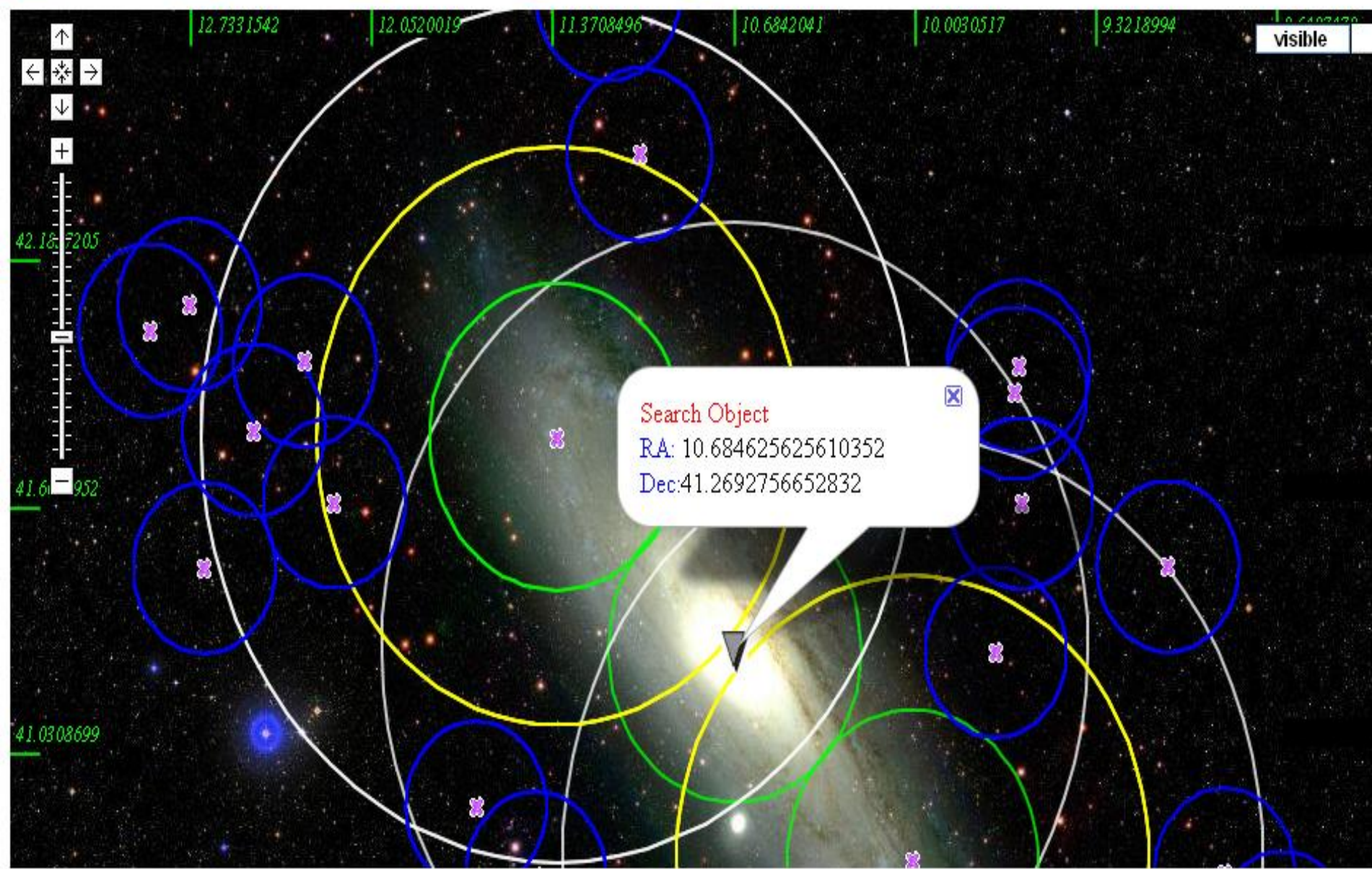
All ▾

[Load All To Sky Map](#)

Legend [Frequency in MHz (Beam size in deg)]

RA: 20.89599609375
DEC: 45.813486496799705

- 150 (1.550)
- 235 (0.950)
- 325 (0.675)
- 610 (0.358)
- 1420 (0.200)



Done

+

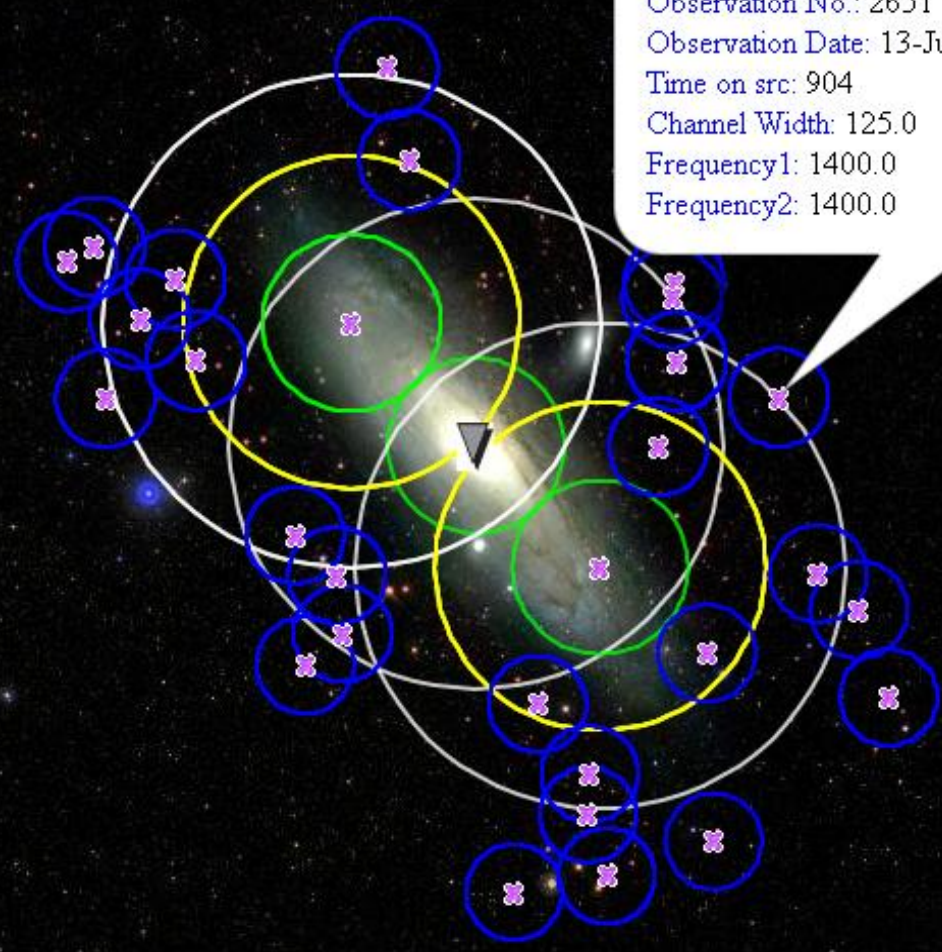
43.06384

41.94385

40.760786

39.607187

-



RA: 9.052274796830902
Dec: 41.47062791578947
Observation No.: 2651
Observation Date: 13-Jun-2006
Time on src: 904
Channel Width: 125.0
Frequency1: 1400.0
Frequency2: 1400.0

Thank You!