




Introduction and Application to TOPCAT

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CTGU/NAOC

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- Tool for operations on catalogues and tables
 - *Does what you want with tables*
 - *Developed mostly in the UK within various UK and Euro-VO projects*

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Main Capabilities

- Data access、 view、 edit
- Data visualization
- Data statistics
- Data cross-matching
- Cone search



TOPCAT Screenshots

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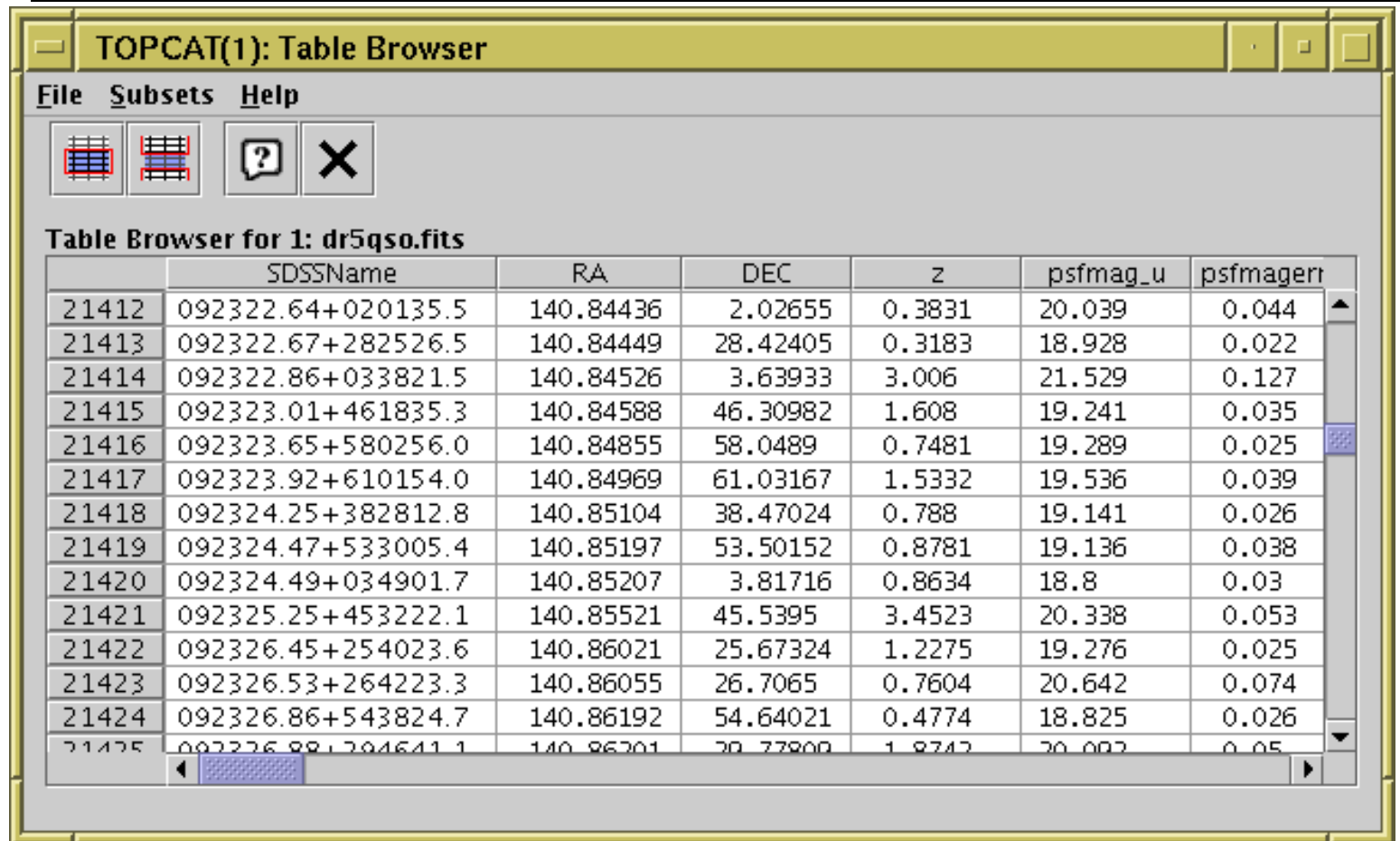
Control Window

The screenshot displays the TOPCAT software interface. The title bar reads "TOPCAT". The menu bar includes "File", "Views", "Graphics", "Joins", "Windows", "Interop", and "Help". A toolbar with various icons is located below the menu bar. The main window is divided into several sections:

- Table List:** A list of tables with "3: SuperCOSMOS.FIT" selected. The list includes:
 - 1: MGC.xml.gz
 - 2: 2mass_xsc.fits
 - 3: SuperCOSMOS.FIT
 - 4: 2QZ_6QZ_zone.csv
- Current Table Properties:** A panel showing details for the selected table:
 - Label: SuperCOSMOS.FIT
 - Location: SuperCOSMOS.FIT
 - Name:
 - Rows: 1210711 (102749 apparent)
 - Columns: 32 (24 apparent)
 - Sort Order: AREA (indicated by an upward arrow)
 - Row Subset: qual_high
 - Activation Action: pointAt(\$ra, \$dec) Broadcast Row
- SAMP:** A section at the bottom containing a "Messages:" field with playback controls (play, stop, refresh) and a "Clients:" field with several icons.

At the bottom left of the window, a status bar shows "14 / 64 M".

Data Window



The image shows a screenshot of the TOPCAT(1) Table Browser window. The window title is "TOPCAT(1): Table Browser". The menu bar includes "File", "Subsets", and "Help". Below the menu bar are icons for table operations: a grid, a grid with a subset, a help icon, and a close icon. The main content area is titled "Table Browser for 1: dr5qso.fits" and displays a table with the following columns: ID, SDSSName, RA, DEC, z, psfmag_u, and psfmagert. The table contains 17 rows of data, with the last row partially cut off.

	SDSSName	RA	DEC	z	psfmag_u	psfmagert
21412	092322.64+020135.5	140.84436	2.02655	0.3831	20.039	0.044
21413	092322.67+282526.5	140.84449	28.42405	0.3183	18.928	0.022
21414	092322.86+033821.5	140.84526	3.63933	3.006	21.529	0.127
21415	092323.01+461835.3	140.84588	46.30982	1.608	19.241	0.035
21416	092323.65+580256.0	140.84855	58.0489	0.7481	19.289	0.025
21417	092323.92+610154.0	140.84969	61.03167	1.5332	19.536	0.039
21418	092324.25+382812.8	140.85104	38.47024	0.788	19.141	0.026
21419	092324.47+533005.4	140.85197	53.50152	0.8781	19.136	0.038
21420	092324.49+034901.7	140.85207	3.81716	0.8634	18.8	0.03
21421	092325.25+453222.1	140.85521	45.5395	3.4523	20.338	0.053
21422	092326.45+254023.6	140.86021	25.67324	1.2275	19.276	0.025
21423	092326.53+264223.3	140.86055	26.7065	0.7604	20.642	0.074
21424	092326.86+543824.7	140.86192	54.64021	0.4774	18.825	0.026
21425	092326.88+794641.1	140.86201	79.77800	1.8742	20.002	0.05

Parameters Window

The screenshot shows the TOPCAT(1): Table Parameters window. The window title is "TOPCAT(1): Table Parameters". The menu bar includes "File", "Parameters", "Display", and "Help". Below the menu bar are four icons: a green plus sign, a trash can, a question mark, and a close button (X).

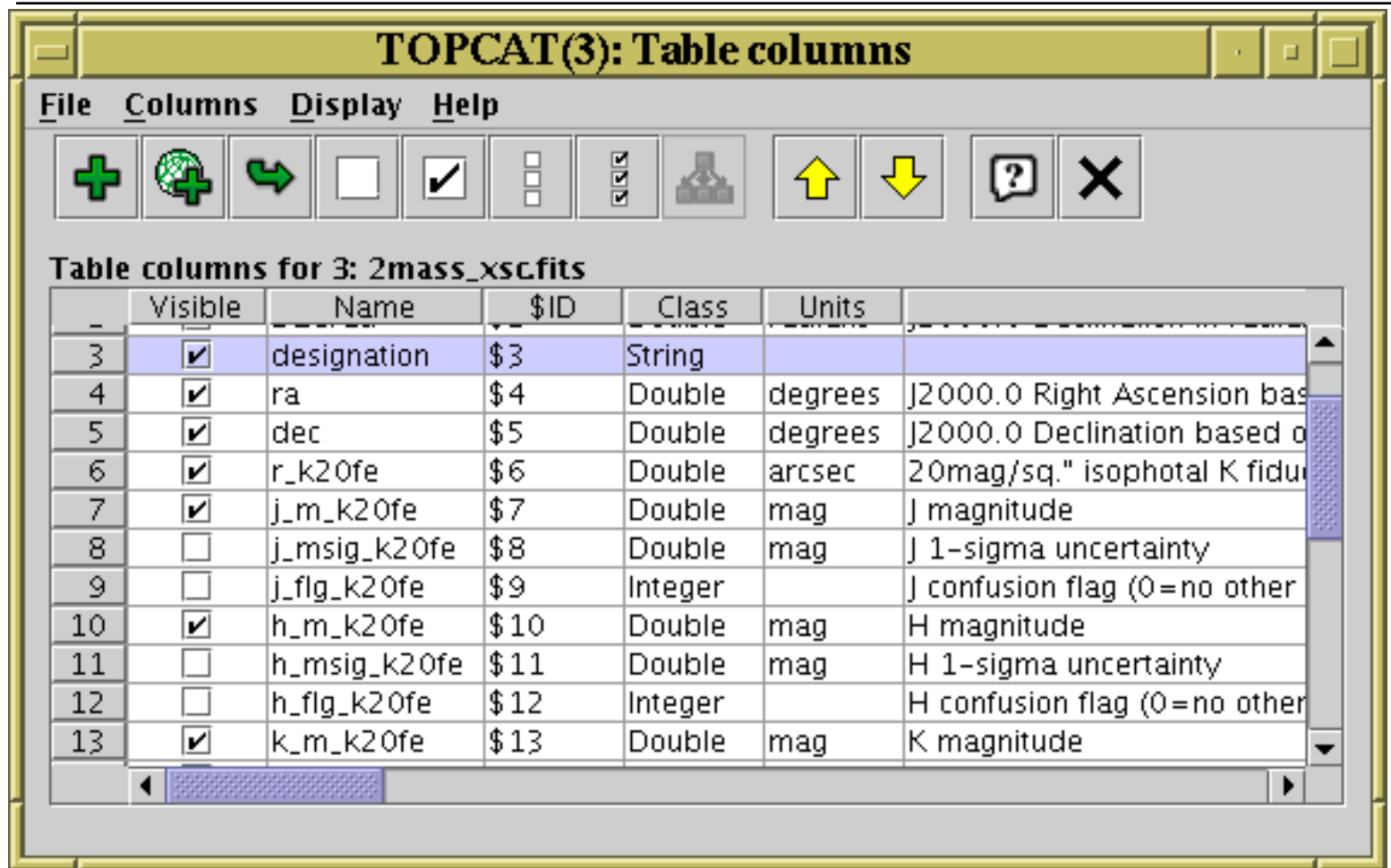
The main area displays "Table Parameters for 1: 6dfgs_mini.xml.bz2". It contains a table with the following data:

Name	Value	Units	UCD	Description
Name	6dfgs_E7_subset			Table name
URL	jar:file:/data/andromeda1/starjava/java/li...			URL of original table
Column Count	17			Number of columns
Row Count	875			Number of rows
Description	6dFGS master config file (version E7 March...			
Original Source	http://www-wfau.roe.ac.uk/6dFGS/6dfgs_...			URL of data file used to
Credits	Column explanations provided by Mike Re...			
Conversion	Converted from 6dfgs_E7.fld.gz by Mark T...			
RESOLUTION	15	arcsec	stat.error;pos.eq.ra	Nominal positional error

Below the table, the "Description" parameter is expanded, showing the following details:

- Name:** Description
- Class:** String
- Shape:**
- Units:**
- Description:**
- UCD:**
- Value:** 6dFGS master config file (version E7 March 2004) - DEMO SUBSET. These data are taken from the 6dF Galaxy Redshift Survey Database, see astro-ph/0505068. Kindly provided by Mike Read, ROE. These data are for EXAMPLE PURPOSES ONLY, intended for demonstrations of some of TOPCAT's properties. For science use, please consult the

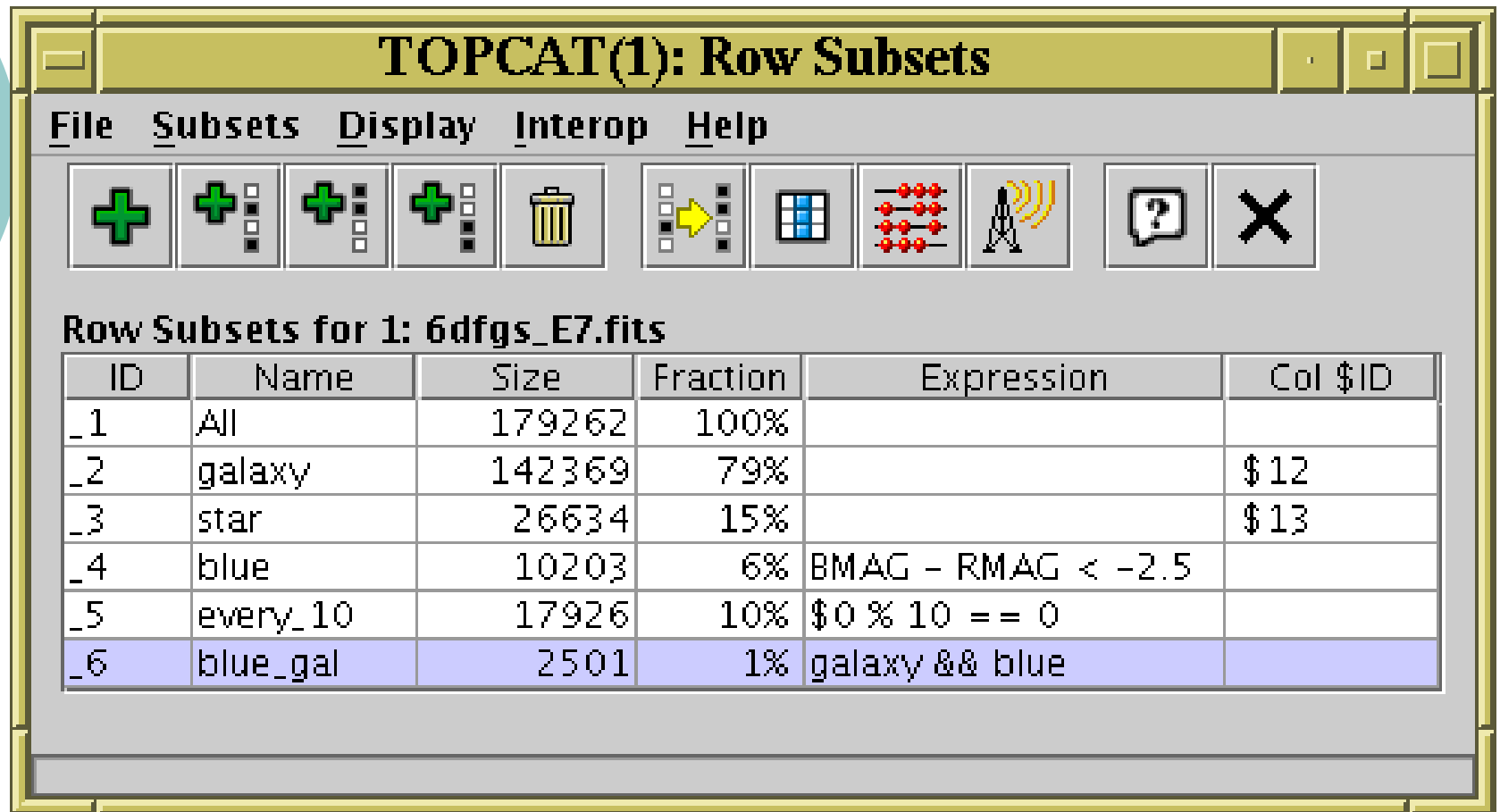
Columns Window



The screenshot shows the 'TOPCAT(3): Table columns' window. The title bar reads 'TOPCAT(3): Table columns'. The menu bar includes 'File', 'Columns', 'Display', and 'Help'. Below the menu bar is a toolbar with icons for adding columns, refreshing, undo, redo, column visibility, column selection, column order, and column deletion. The main area displays a table titled 'Table columns for 3: 2mass_xsc.fits'. The table has columns for 'Visible', 'Name', '\$ID', 'Class', 'Units', and a description. The 'Visible' column contains checkboxes, and the 'Name' column contains column names like 'designation', 'ra', 'dec', etc.

	Visible	Name	\$ID	Class	Units	
3	<input checked="" type="checkbox"/>	designation	\$3	String		
4	<input checked="" type="checkbox"/>	ra	\$4	Double	degrees	J2000.0 Right Ascension bas
5	<input checked="" type="checkbox"/>	dec	\$5	Double	degrees	J2000.0 Declination based o
6	<input checked="" type="checkbox"/>	r_k20fe	\$6	Double	arcsec	20mag/sq." isophotal K fidu
7	<input checked="" type="checkbox"/>	j_m_k20fe	\$7	Double	mag	J magnitude
8	<input type="checkbox"/>	j_msig_k20fe	\$8	Double	mag	J 1-sigma uncertainty
9	<input type="checkbox"/>	j_flg_k20fe	\$9	Integer		J confusion flag (0=no other
10	<input checked="" type="checkbox"/>	h_m_k20fe	\$10	Double	mag	H magnitude
11	<input type="checkbox"/>	h_msig_k20fe	\$11	Double	mag	H 1-sigma uncertainty
12	<input type="checkbox"/>	h_flg_k20fe	\$12	Integer		H confusion flag (0=no other
13	<input checked="" type="checkbox"/>	k_m_k20fe	\$13	Double	mag	K magnitude

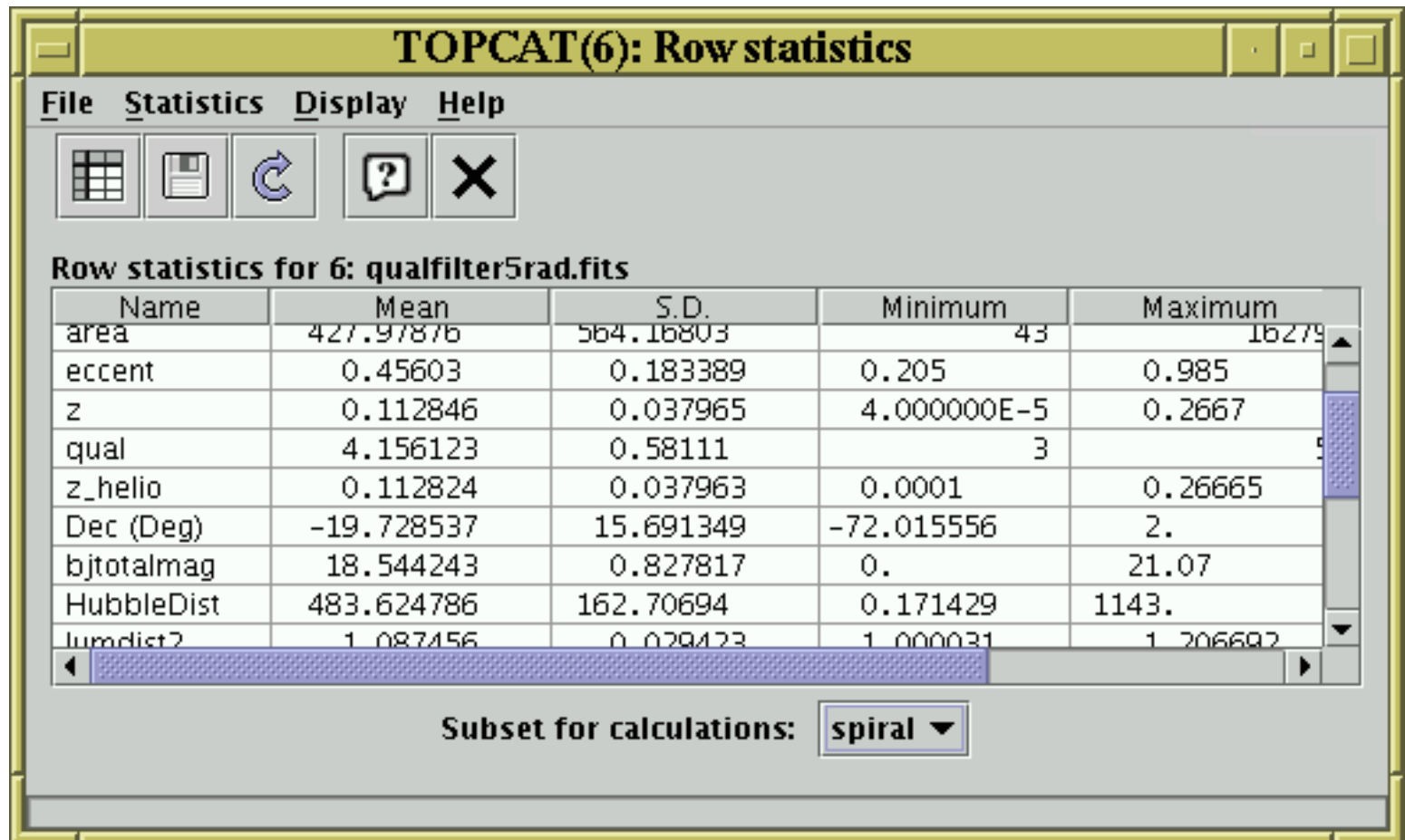
Subsets Window



The screenshot shows the TOPCAT(1): Row Subsets window. The title bar reads "TOPCAT(1): Row Subsets". The menu bar includes "File", "Subsets", "Display", "Interop", and "Help". The toolbar contains icons for adding, deleting, and managing subsets. Below the toolbar, the text "Row Subsets for 1: 6dfgs_E7.fits" is displayed. A table lists the subsets with columns for ID, Name, Size, Fraction, Expression, and Col \$ID.

ID	Name	Size	Fraction	Expression	Col \$ID
_1	All	179262	100%		
_2	galaxy	142369	79%		\$12
_3	star	26634	15%		\$13
_4	blue	10203	6%	BMAG - RMAG < -2.5	
_5	every_10	17926	10%	\$0 % 10 == 0	
_6	blue_gal	2501	1%	galaxy && blue	

Statistics Window

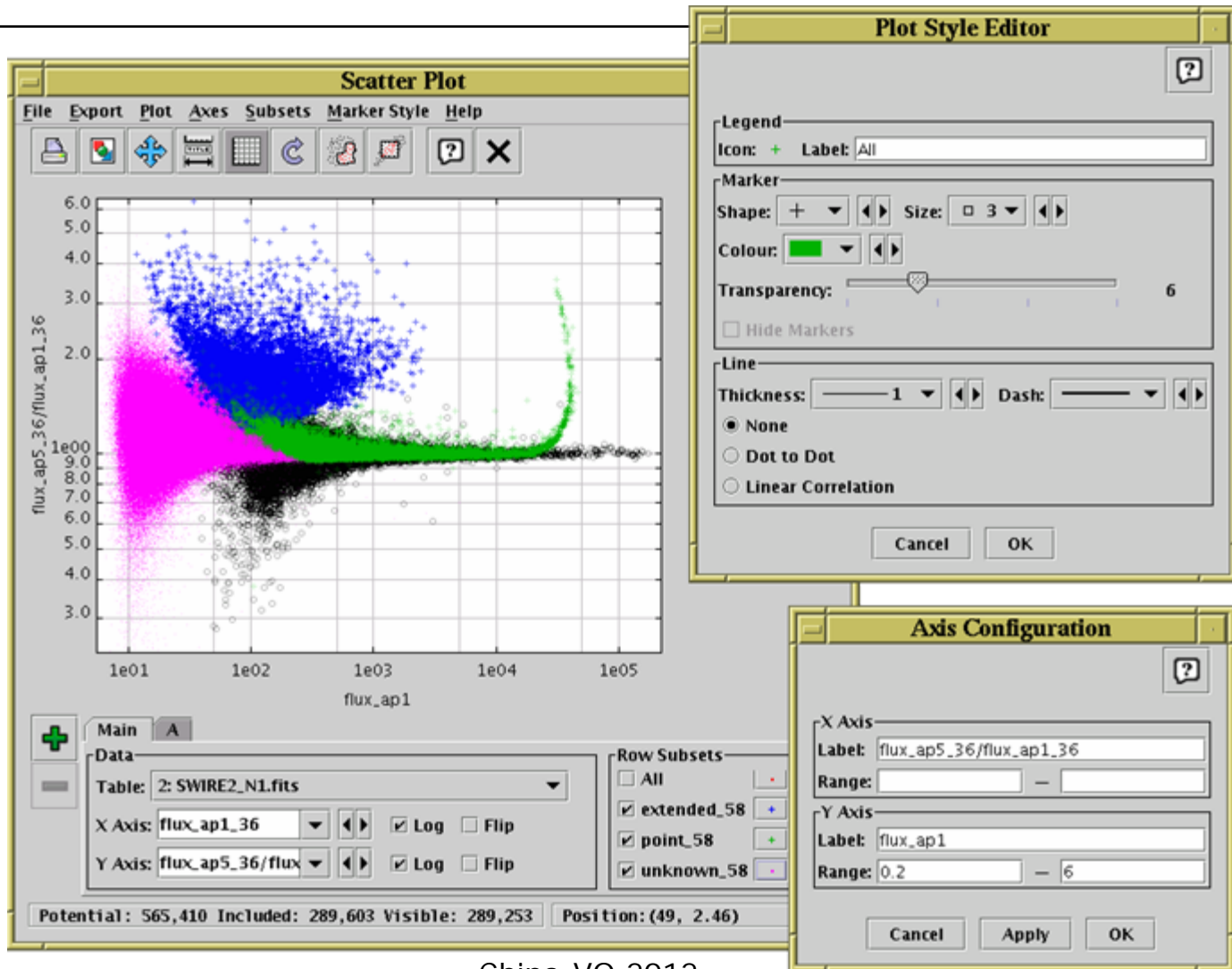


The screenshot shows the 'TOPCAT(6): Row statistics' window. The title bar is yellow and contains the text 'TOPCAT(6): Row statistics'. Below the title bar is a menu bar with 'File', 'Statistics', 'Display', and 'Help'. Underneath the menu bar is a toolbar with icons for grid, save, refresh, help, and close. The main area displays 'Row statistics for 6: qualfilter5rad.fits' and a table with five columns: Name, Mean, S.D., Minimum, and Maximum. The table lists several parameters with their corresponding statistical values. At the bottom, there is a 'Subset for calculations:' label followed by a dropdown menu currently set to 'spiral'.

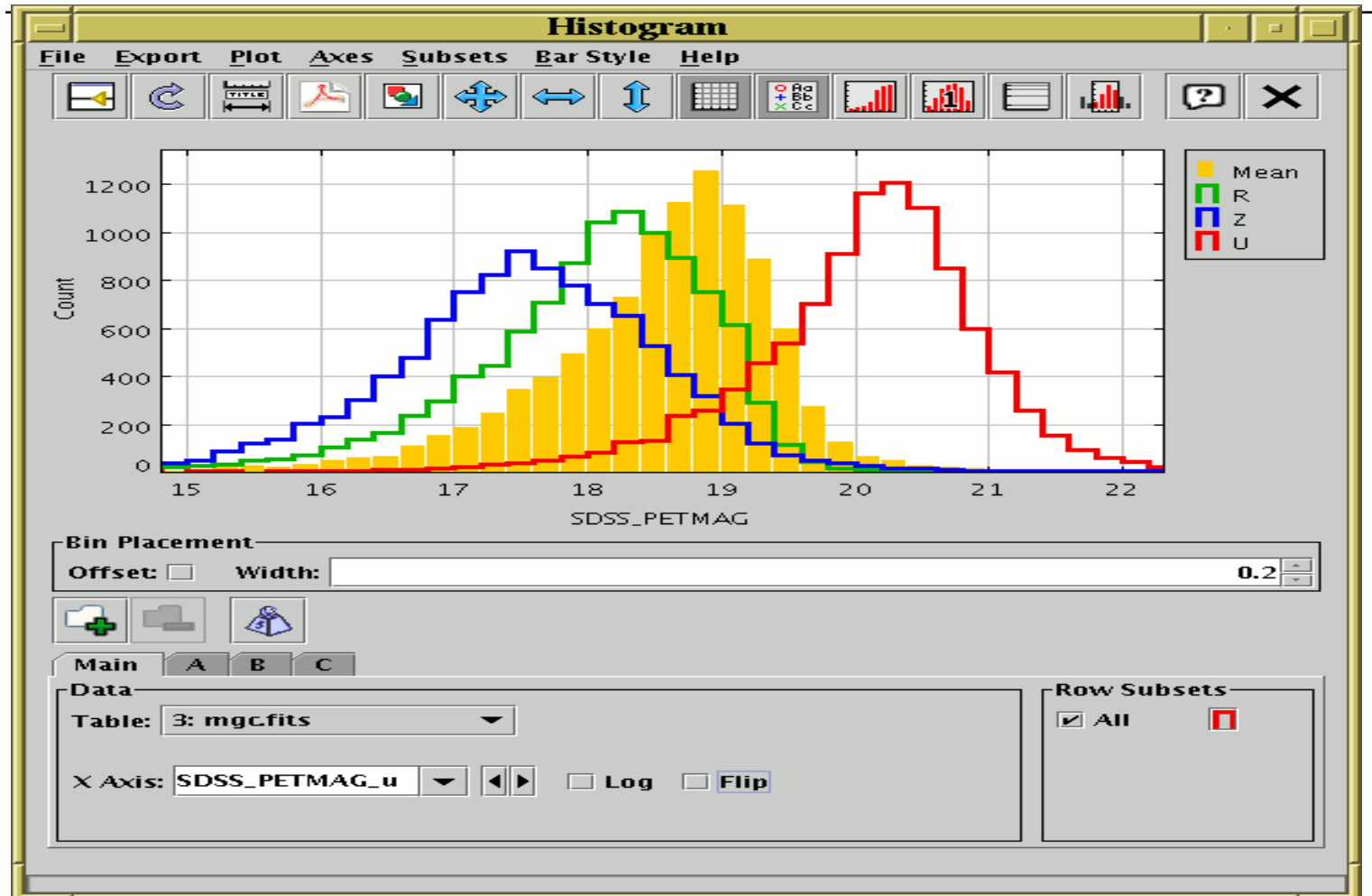
Name	Mean	S.D.	Minimum	Maximum
area	427.97876	564.16803	43	16279
eccent	0.45603	0.183389	0.205	0.985
z	0.112846	0.037965	4.000000E-5	0.2667
qual	4.156123	0.58111	3	5
z_helio	0.112824	0.037963	0.0001	0.26665
Dec (Deg)	-19.728537	15.691349	-72.015556	2.
bjtotalmag	18.544243	0.827817	0.	21.07
HubbleDist	483.624786	162.70694	0.171429	1143.
lumdist2	1.087456	0.029423	1.000031	1.206692

Subset for calculations: spiral ▼

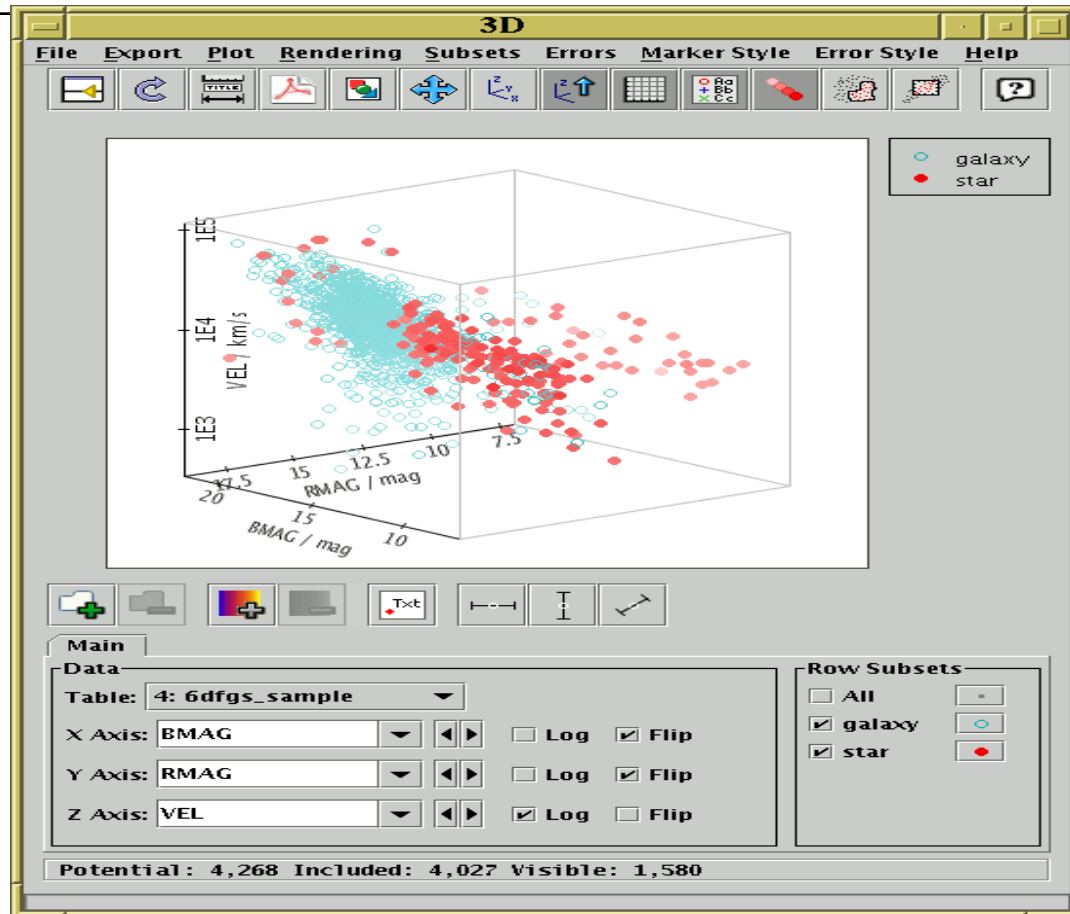
2D Plot Window



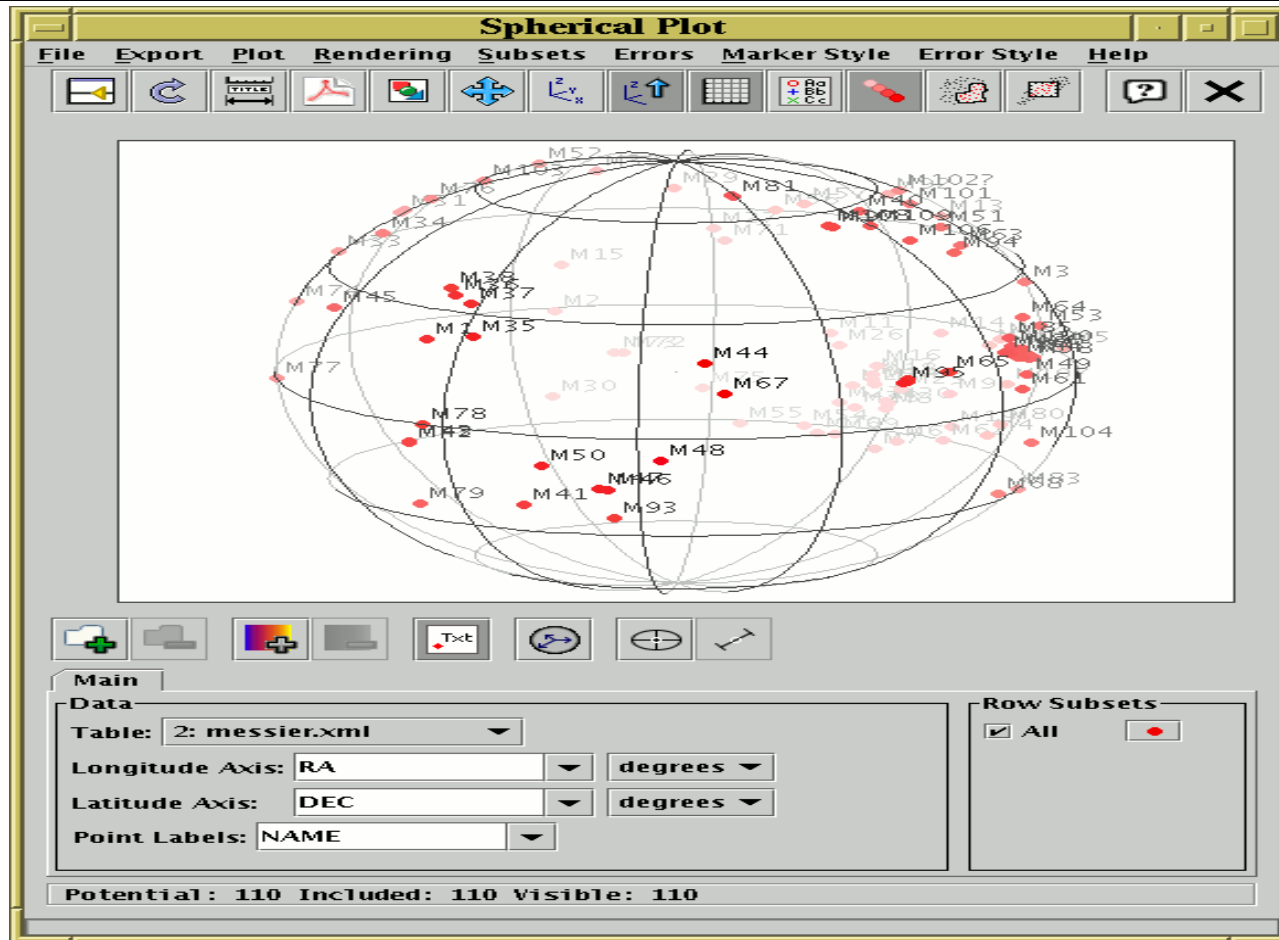
Histogram Window



3D Plot Window



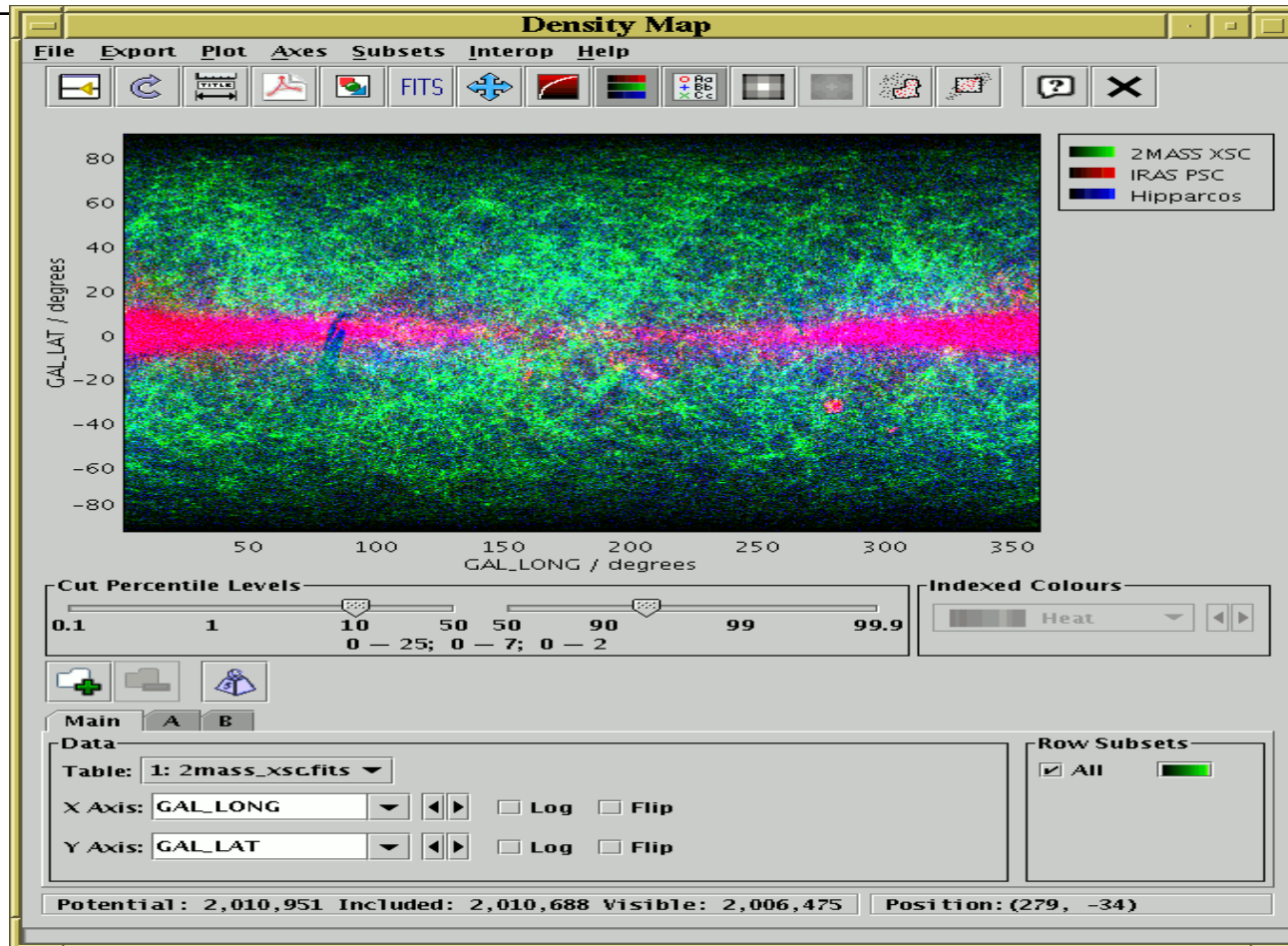
Spherical Polar Plot Window



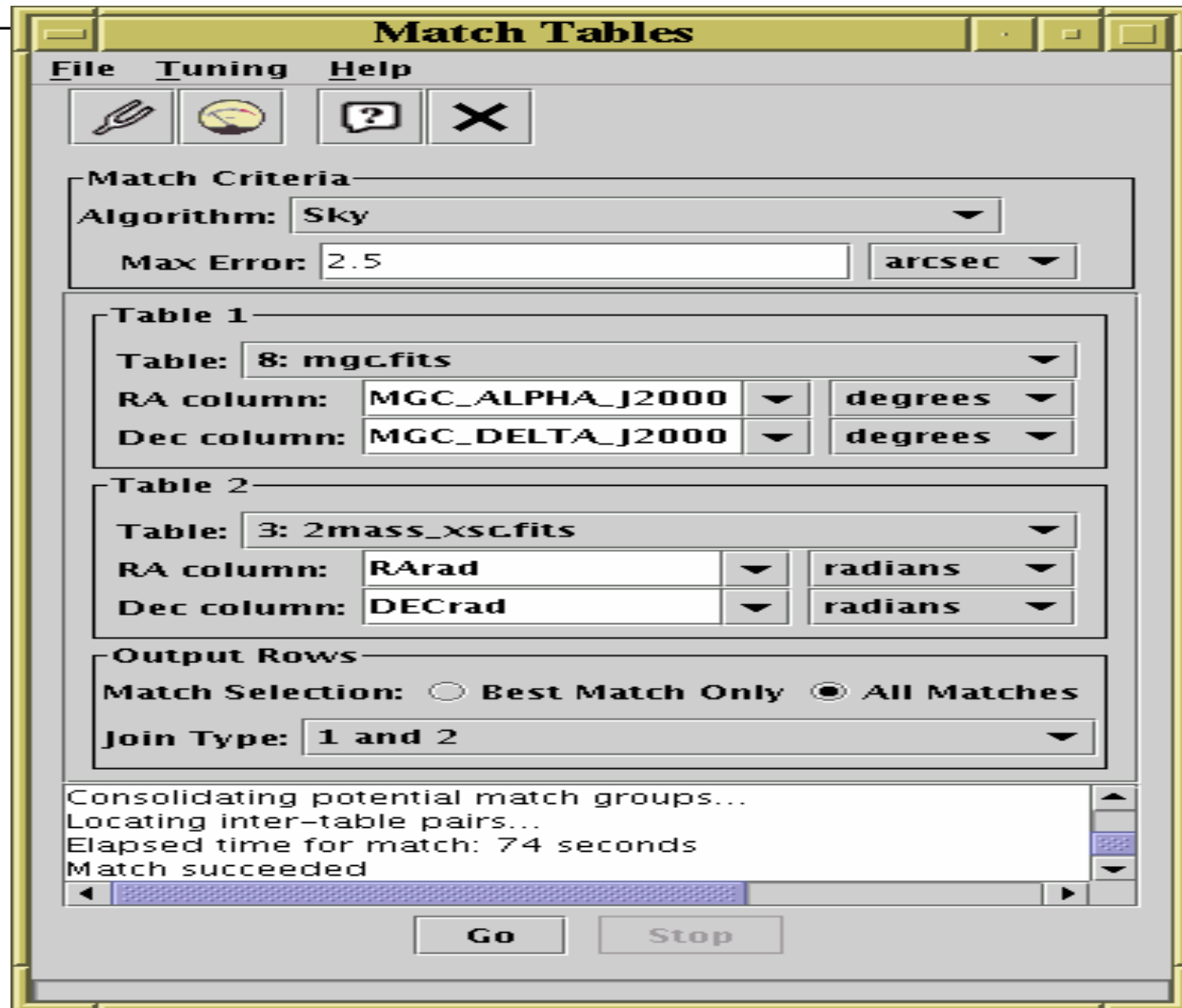
Stacked Line Plot Window



Density Map Window



Match Window

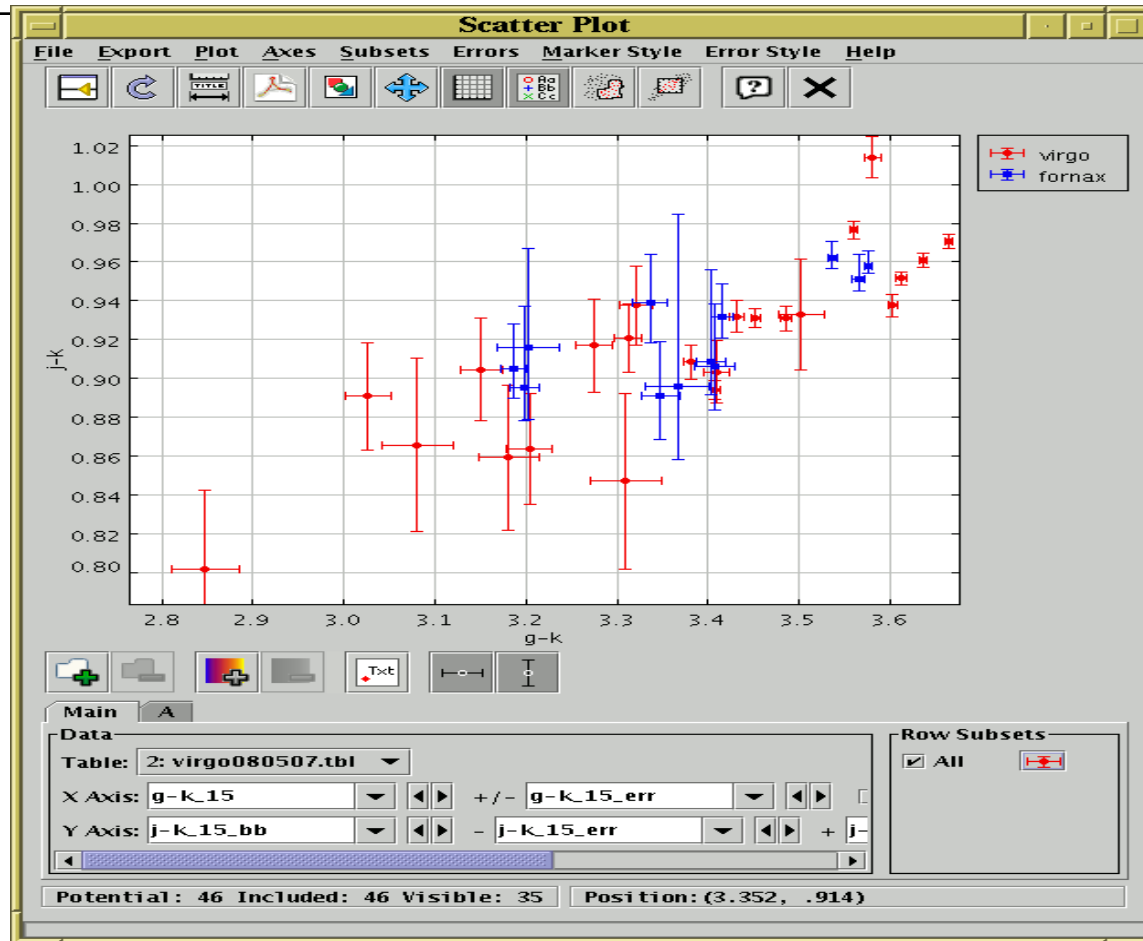




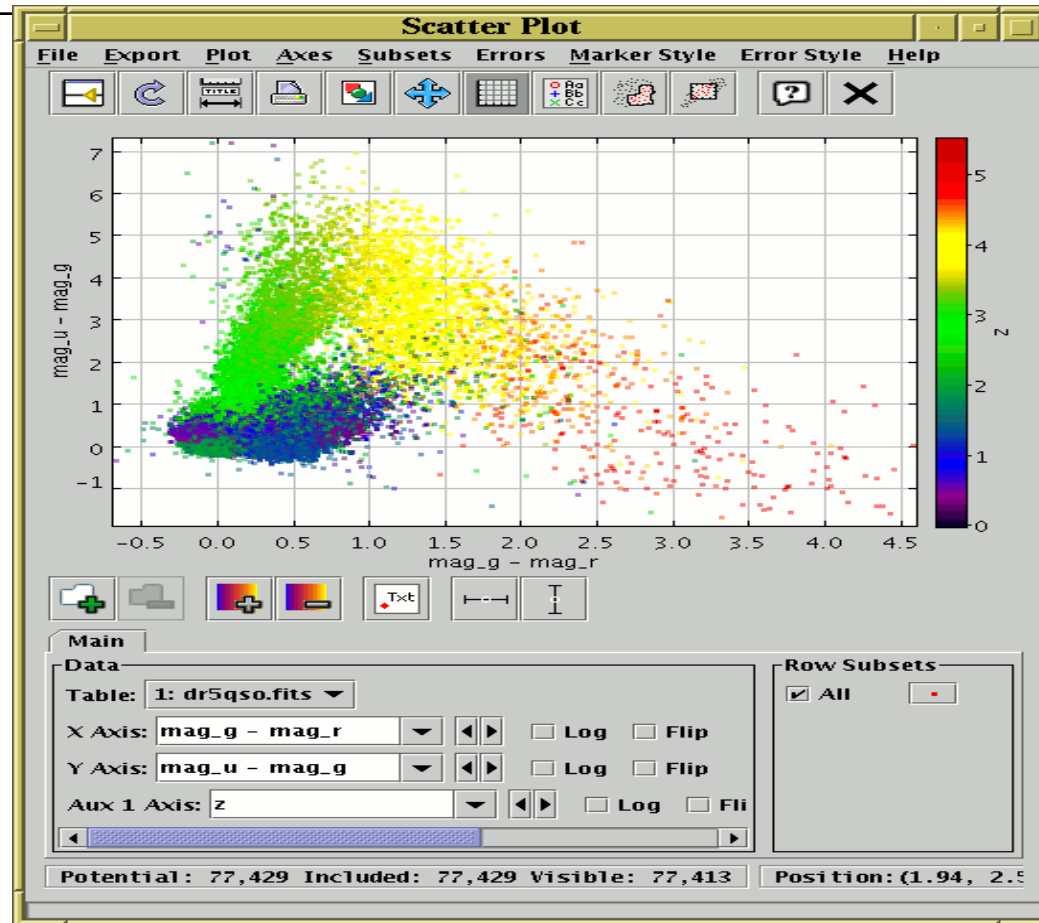
New features in Version 3

- Error Bars
- Auxiliary Axes
- Histogram Weighting

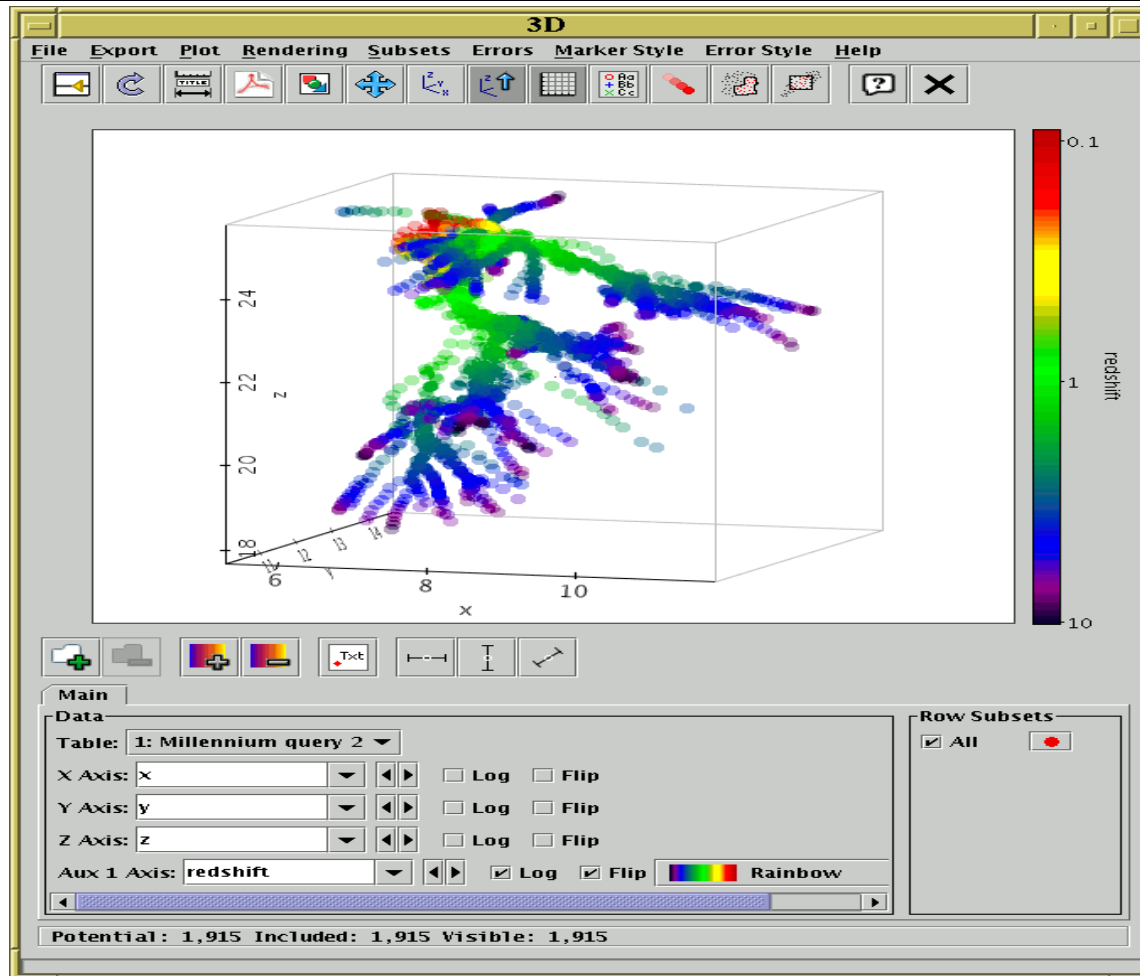
Scatter plot with errors



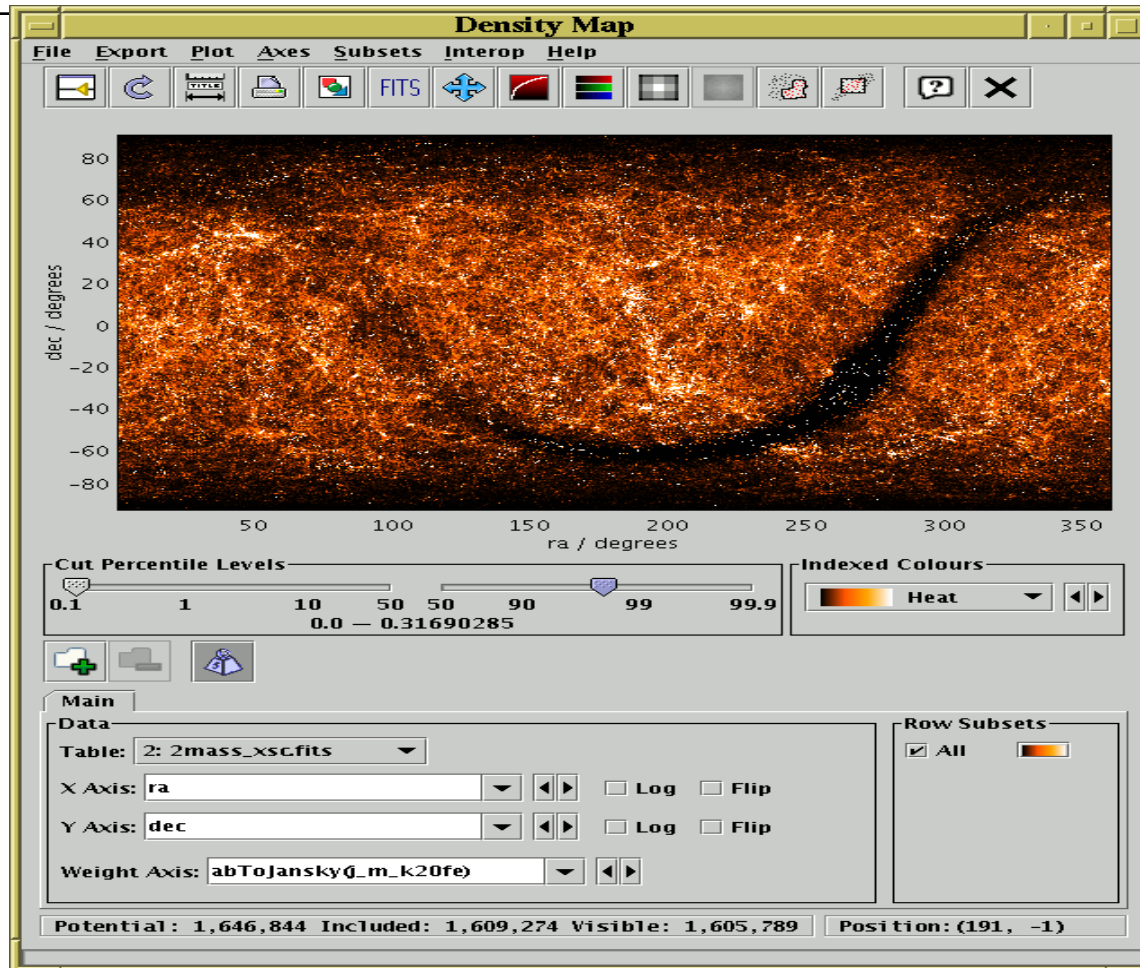
Scatter plot with auxiliary axis



3D plot with auxiliary axis



Density map with weighting



Installation

- You just need to ensure that you have a suitable Java Runtime Environment (JRE).
- Download: [http://www.star.bris.ac.uk/~m
bt/topcat/](http://www.star.bris.ac.uk/~m
bt/topcat/)
- The most recent public release of TOPCAT is **version 3.9**, released 27 October 2011.

Supported table input formats

- FITS TABLE or BINTABLE (binary table)
- VOTables
- ASCII tables
- Comma-Separated Values
- Results of SQL queries on relational databases
- IPAC format

Supported output formats

- FITS BINTABLE (binary table)
- VOTables
- Plain ASCII text
- Comma-Separated Values
- HTML TABLE element
- LaTeX tabular environment
- New table exported to an SQL-compatible relational database



Application

- demonstration



Thanks