

ROOT GUI interface to MySQL Databases

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1 Introduction

During the past couple of years the MySQL database became the most popular interface for storing cooking and calibration constants in CLAS collaboration. The following document describes a ROOT interface for plotting data from MySQL database.

2 Installing the RootMySQLGui Package

The package *RootMySQL* was implemented using ROOT plotting library and Graphical User Interface (GUI). It can be obtained from CLAS CVS server by:

```
$ cvs checkout tools/RootTools/RootMySQLGui
```

In order to compile the package one needs CERN ROOT package installed with MySQL libraries (usually ROOT binaries do not contain the MySQL library, one needs to compile them from the source). Also at run time the program requires the MySQL shared libraries (libmysqlclient.so). After compiling the program one needs to make sure that the environmental variable *LD_LIBRARY_PATH* contains the directory where the mysql shared libraries can be found.

3 Running the RootMySQLGui

3.1 Configuring the Database

Once compiled the executable will be created in the source directory called “rootmysqlgui”. The program window is shown in Figure 1. The first step is to configure the program to the desired database. Initially program is not configured for any database and it will direct user to the configuration tab in the GUI, shown in Figure 2. The text entry fields have to be filled with database host name, database user name and database to connect to (the password feature is disabled). When the button with a tag “Connect” (indicated in the Figure 2 with label 1) is pressed, the pop-up box under the connect button is updated with the list of tables from the database. After selecting the table, one needs to press “Select” (indicated in the Figure 2 with label 2) button to change the database settings. If the table is accessible the program will redirect user to the plotting tab (shown in Figure 1) where the pop-up boxes labeled as “X axis” and “Y axis” are filled with the column names from the selected table. Once the database has been configured the program will remember the last database and table and when run again will start up with the last settings of database.

3.2 Plotting from Table

When database information is set and accepted by the program the user will be redirected to plotting tab where the pop-up lists corresponding to labels “X Axis”, “Y axis”, “Normalization” and “Order By” will be filled with the names of columns from selected table. To produce a plot one needs to select from the pop-up menus of “X axis” and “Y axis” variables to be plotted and the press the “Draw” button located in the left-bottom of the program window. This will produce a plot on the canvas of the program.

Additional controls are added to provide the user with more flexibility of selecting the data to be plotted. On the tab shown in Figure 1 there is a check-box labeled as “Order by”, when the check-box is checked the data will be retrieved from the database ordered by the value in the column selected in the pop-up box in right side of the check-box. This feature is useful when plotting data points connected with a line (see Section “Configuring the Graph”).

The check-box labeled “Normalize To” can be used to normalize the plot

to the one of the columns in the database table. If the check-box is checked, each number in the column “Y axis” will be divided by the number in the column selected in the pop-up box to the right of the check-box “Normalize To”.

Also, user can filter data with a condition that can be entered in the text box with a label “Query Filter”. This string must be in MySQL query format (the word “where” is added, so it is not necessary). For example, a line entered in the query filter text box:

$$NPROC > 1000 \text{ and } runno < 23000 \quad (1)$$

will plot from the chosen table only those rows for which the variable “NPROC” is greater than 1000 and variable “runno” is less than 23000. Again, the check-button on the left of the text box has to be checked to activate the query filter.

3.3 Graphic Layout

The plot on the right side of the GUI will be updated every time the “Draw” button is pressed. The sizes of labels and titles, as well as their distances from the labels can be changed in the tab labeled as “Graph Options” (see Figure 4). The pop-up list labeled as “Graph Mode” lets user to choose whether the graph will be plotted with markers, lines or both. And the rest of the buttons let the user to change the sizes of labels, titles, etc.

The group box in the bottom of the tab allows user to change the distances of the axis from the edges of the canvas (margins). Once this parameters were changed during a session, they will be saved in a configuration file (configurations are saved in file $\$HOME/.rootmysqlgui/default.cfg$), which will be loaded next time the program runs. The configuration file can be deleted, in which case the program will generate the default configuration file. It is not suggested to edit it.

3.4 Colors

The colors of the graph as well as the colors of the pad and the axis can be controlled in the “Colors” tab, shown in Figure 3.

3.5 Saving the Plot

The program can produce a postscript output from the canvas when the “Print” button is pressed. It will produce a postscript file with a default name. One must be careful to not overwrite already created file.

4 Appendix

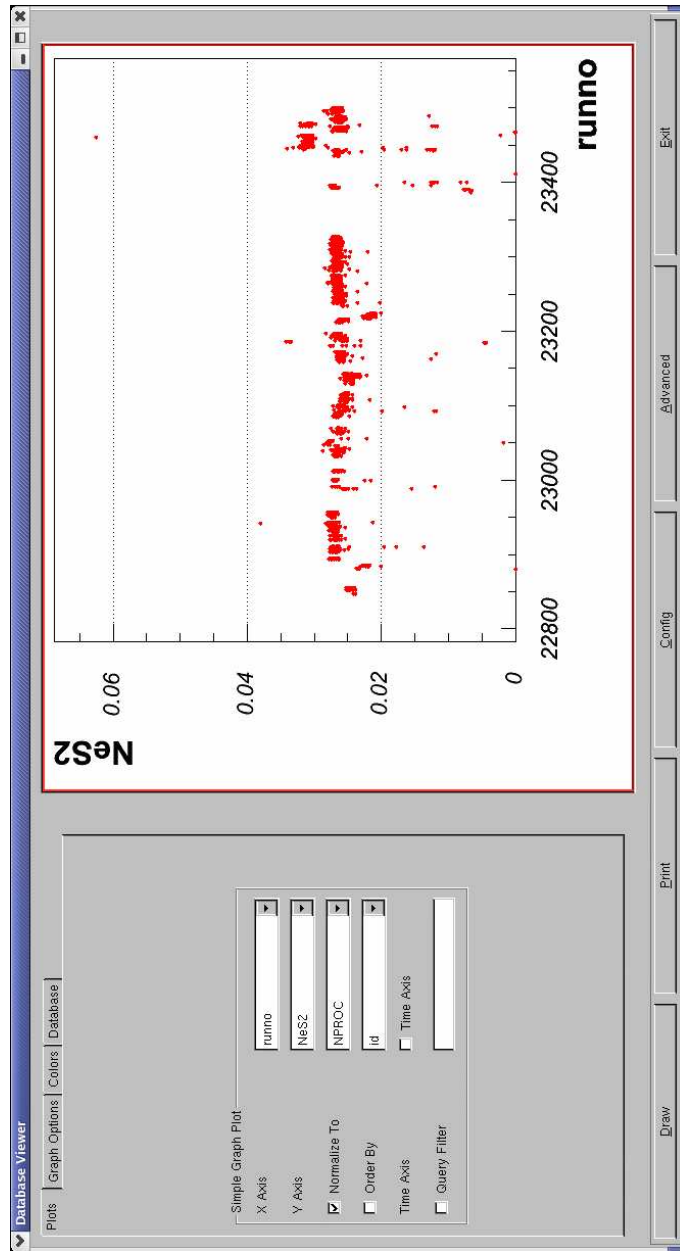


Figure 1: Plot window. A sample plot from database.

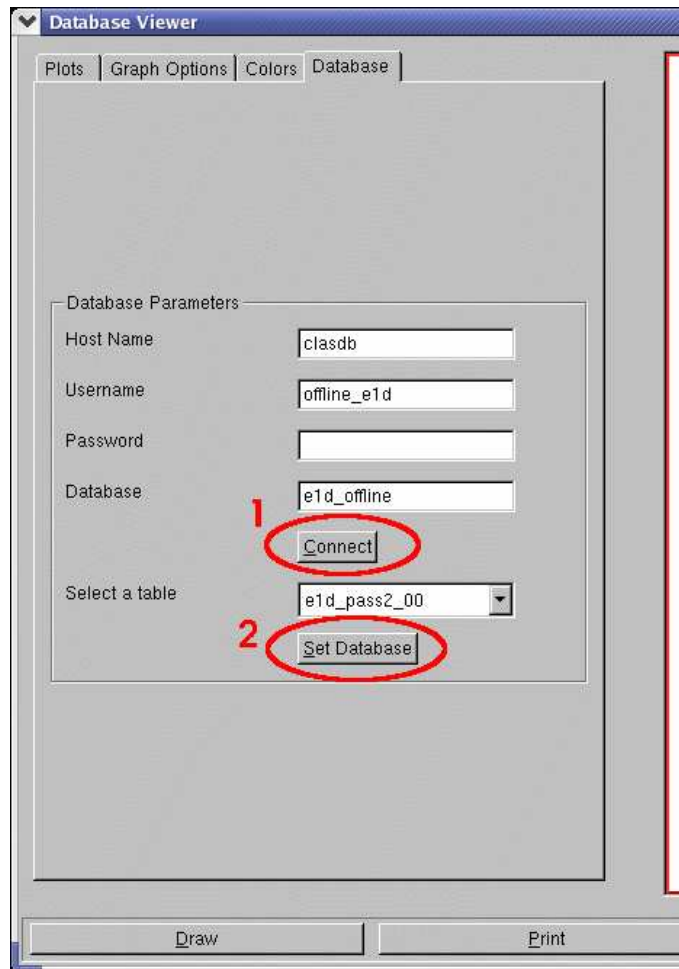


Figure 2: The database configuration window. Allows user to connect to the database table by providing host name, user name and the database name.

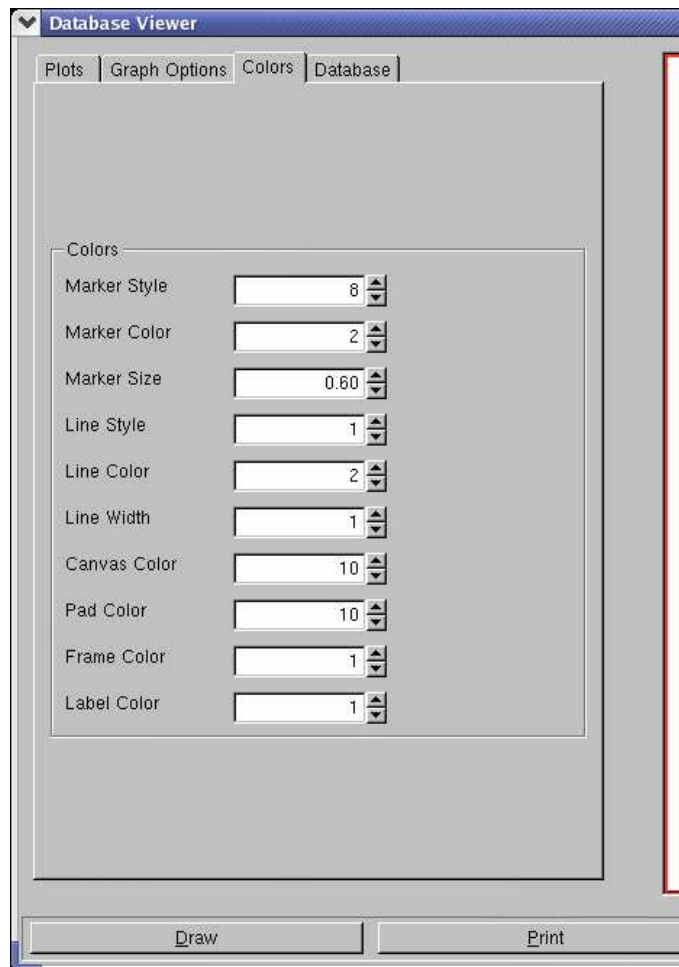


Figure 3: The color configuration window. The user can configure the color of the markers, also the color of the pad and axis.

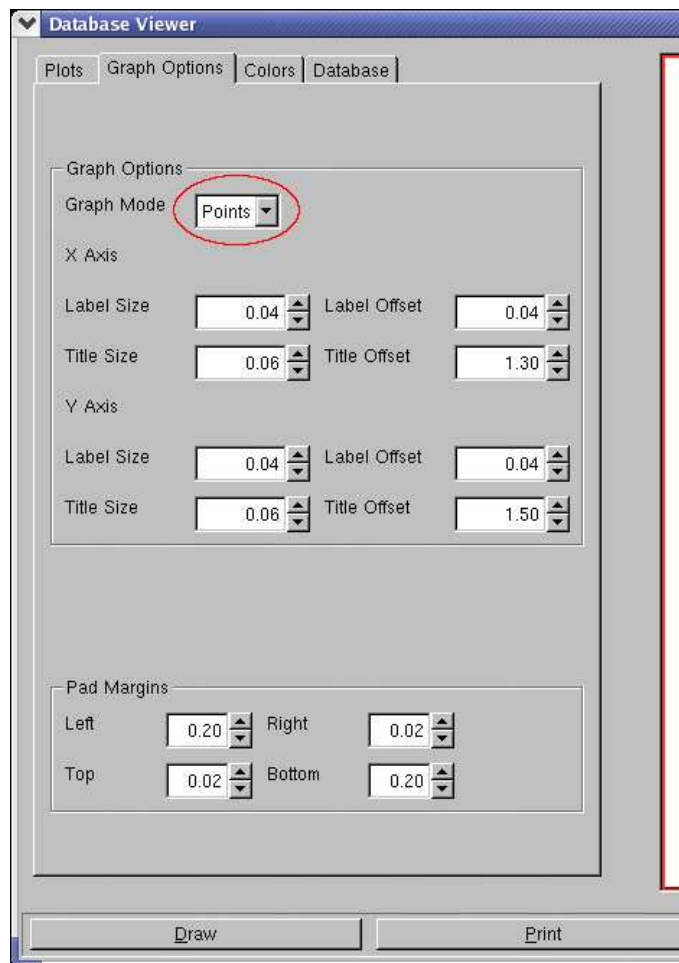


Figure 4: The graphmode configuration window. Allows user to control the layout of the graph and the label sizes and title sizes.