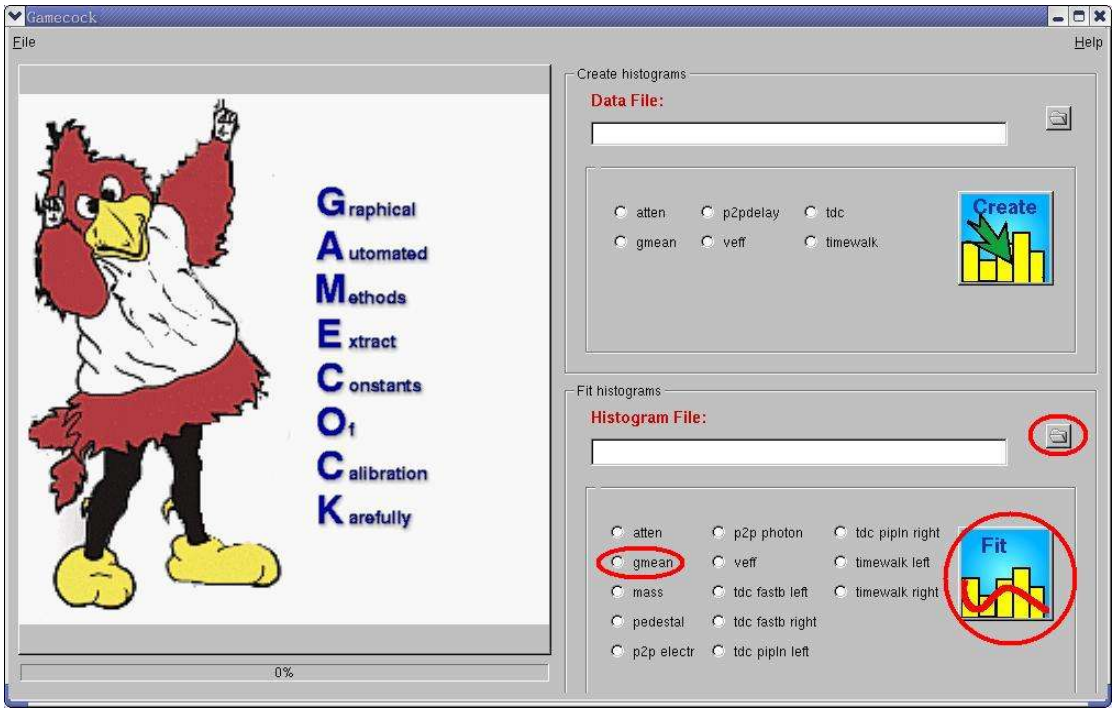
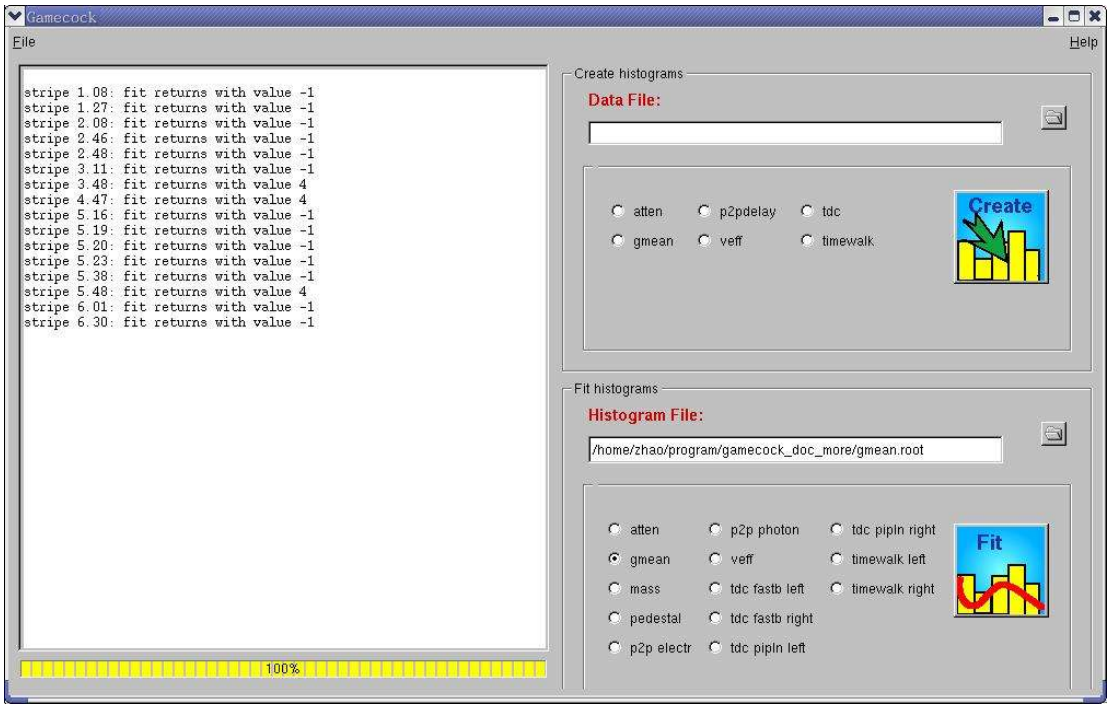
Tutorial: Gmean

Like “atten” calibration, the whole process begins with choosing the input file. Leaving the “Histogram File” entry blank will make Gamecock use the default file “./root/atten.root”. (If there's no such file, it will report an error in a pop-up window). The next step is choose the radio button " gmean”. Then we can click the big “Fit” button to begin the ride.



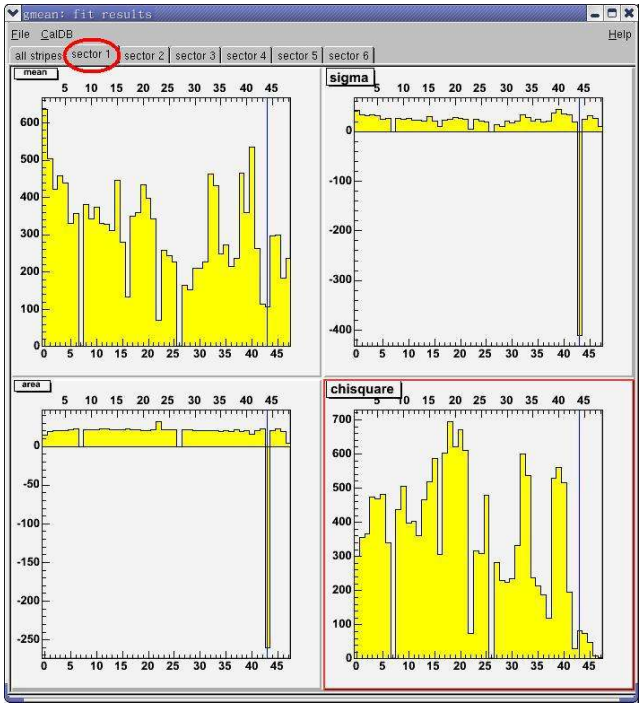
When you see the processing bar moving, you should see also the problematic channels showing in the log window. It reads like sector 1, channel 08 having no data. Here value “-1” means no data (or a dead channel) and value “4” means no successful fit which can be generally caused by too few data entries.



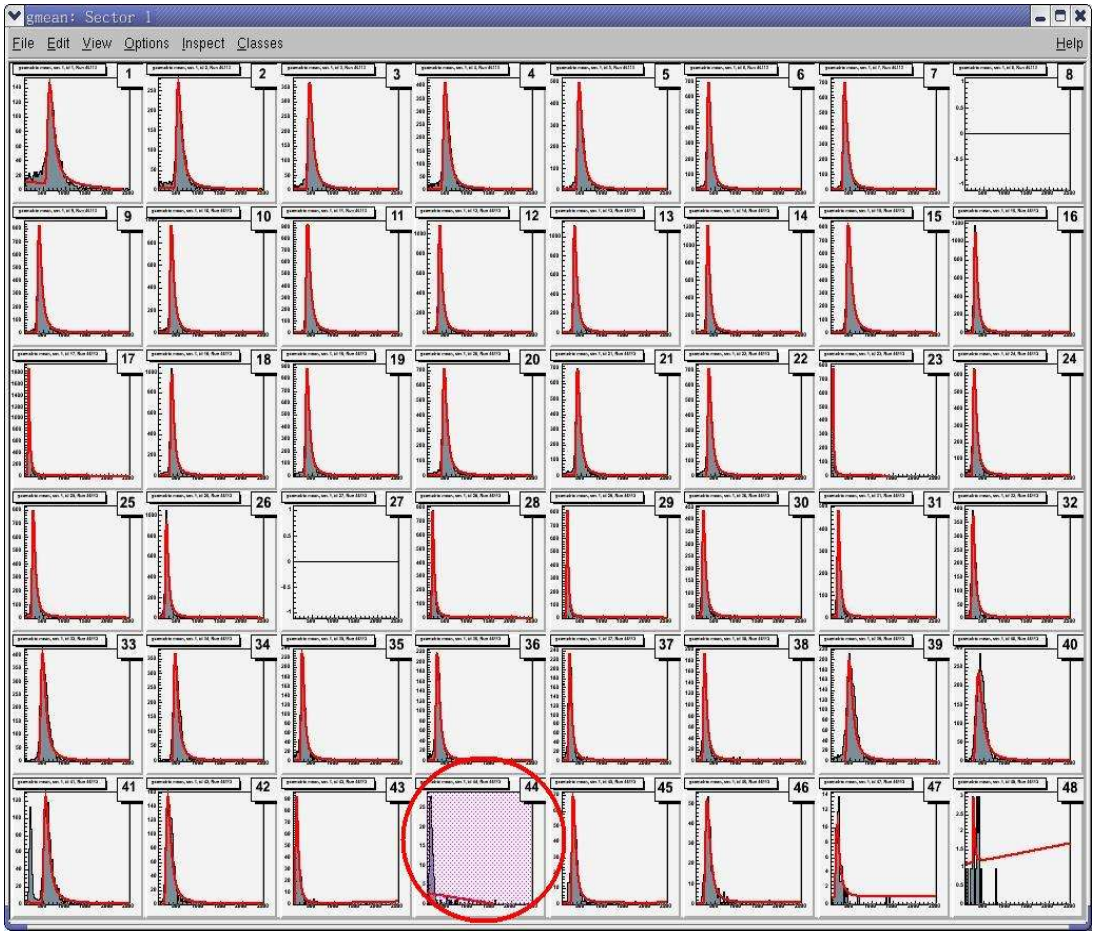
After the auto-fitting process is done, two new windows will pop up.

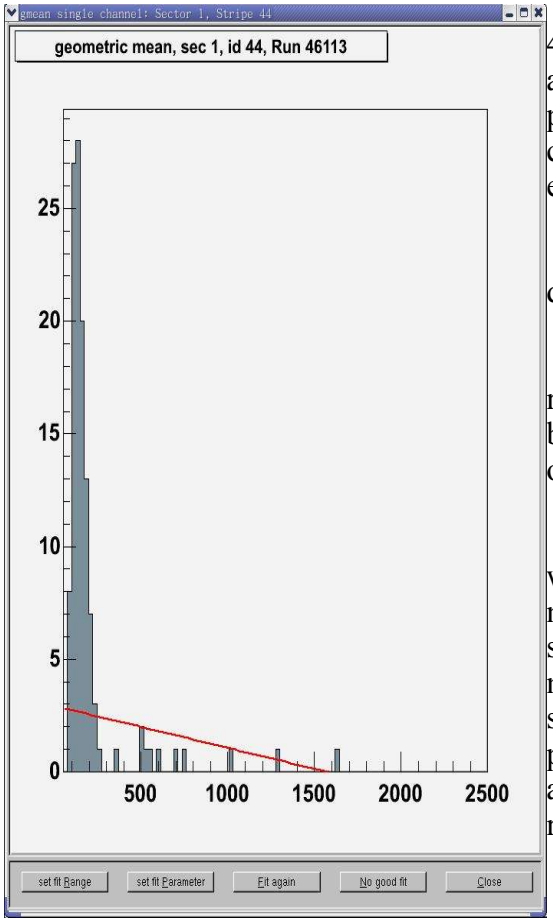
The “fit results” window shows the mean, sigma, area under the fit/histogram entries, chisquare

The other one with thumbnails shows all of the histograms and their fits for one sector.



Let's go to Sector 1 first. It's easy to see there's a strike at Stripe 44 on the “fitting results” window. From the thumbnail window, we can see Stripe 44 doesn't have a good fit. Clicking on the thumbnail of Stripe 44, a new window will pop up to show the bigger figure for this channel.



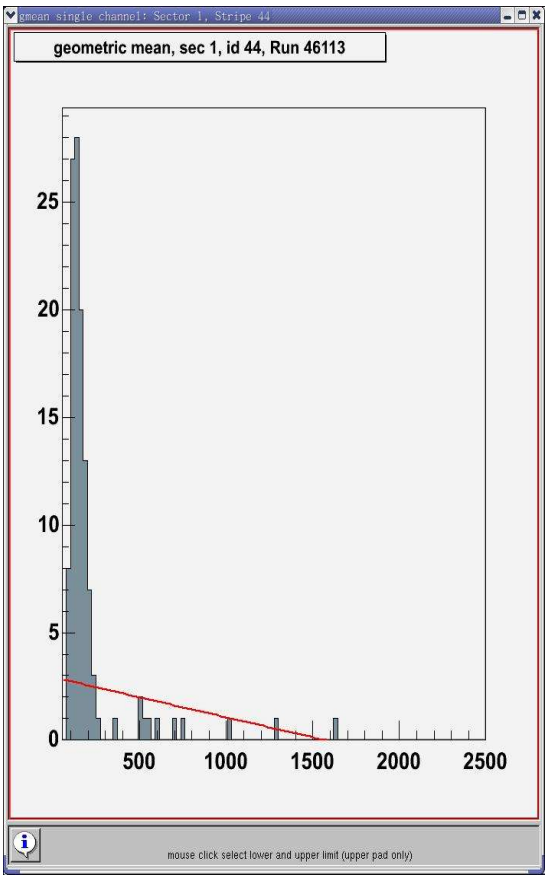


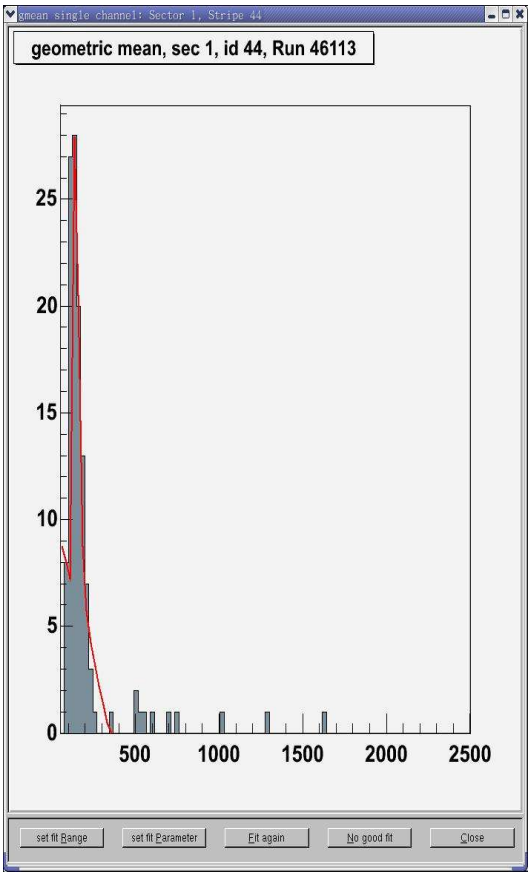
Even though we know that Stripe 40 – 48 have coupled PMTs so that they always give trouble (sometimes double peaks, check other sectors to see), we still can try to fix this Stripe 44 just as an example.

Here we mainly have two ways to do it.

The first one is try to reset the fit range. After clicking on the “set fit Range” button, the window will change like the left one below.

Following the hint at the bottom, we can use two left mouse clicks to set up a new fit range. In our case, because there's so few input data about 350, we choose the new range between 0 and 350. After the second click, the window will back to the previous looking. Then click the button “Fit again”, we get a new fitting result like the right one.

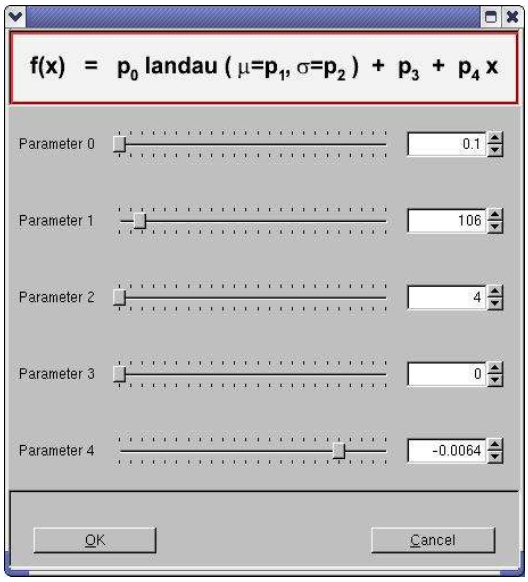


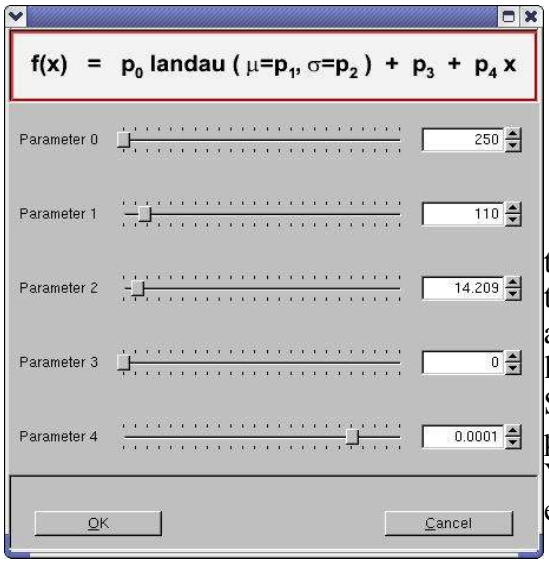


The other way is to try to reset the fit parameters.

Click on the “set fit Parameter” button, a setup window will pop up like the one at right. The fitting formula is shown at the top. All of the parameters are showing the current fit values.

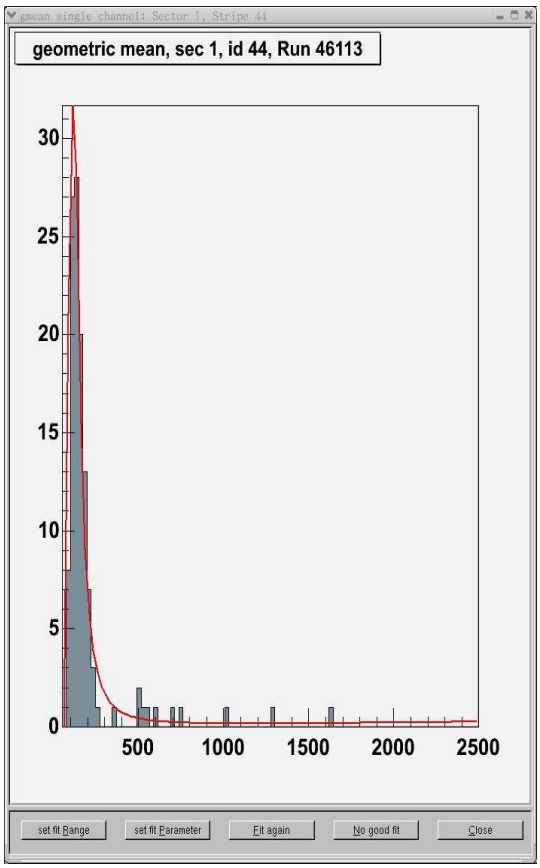
To change them, move the parameter bars to find approximate values and then modifying the numbers in the text entries to

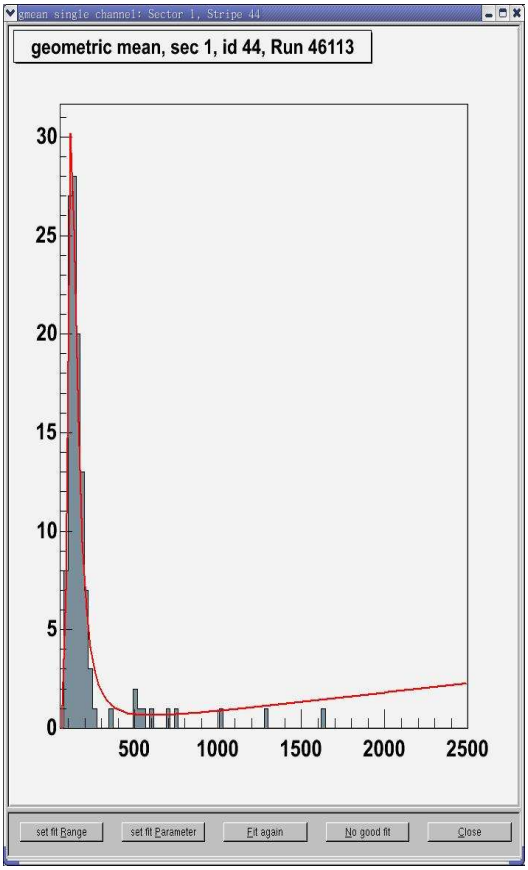




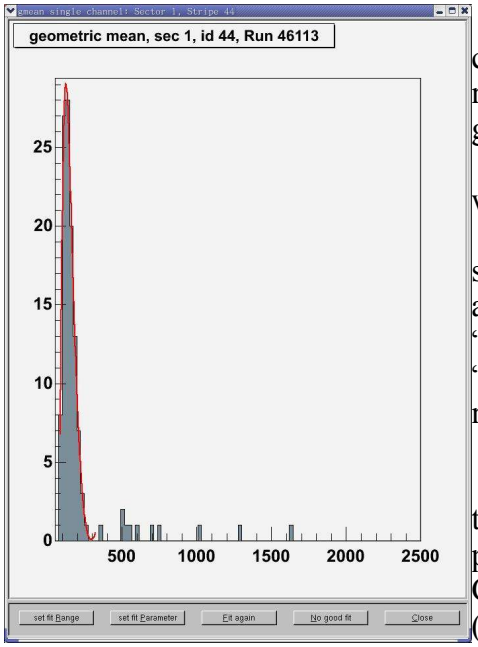
tune (the left picture). While we change the values, the red fitting line will change according to the new parameters like the lower left one.

Sometimes, it's hard to find a set of good parameters in the range the bars can reach. You can make change the values in the text entries, which are not limited.





So finally, we can try it until there's good looking fit like the left picture in the last page. Now we can click “Ok” to close the parameter windows and then “Fit again”, we got the figure as the right one.



Combining the two methods, we can change both the fit range and parameters and repeat it to obtain the best fitting result. Here we got the result like the left figure below.

The fitting values in the “fit results” window is shown below.

Actually, our fit for the Stripe 44 is not satisfying because there are just two few data above 350. Therefore, we can simply click the “No good fit” and follow the instruction in “Tutorial: How to deal with channel without a reasonable data distribution”.

By repeating the steps mentioned to look through all channels in all sectors, we are ready to push the constants into database. Ref: “Tutorial: Check calibration constants into the Caldb (MySQL) database”.