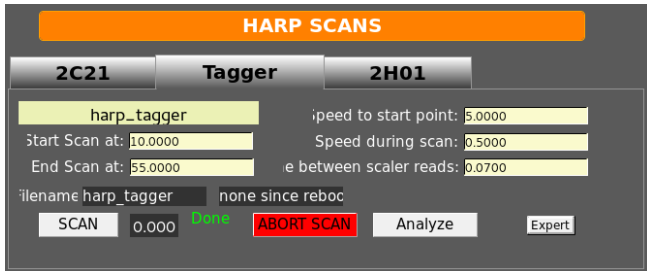


Harp Fitter manual

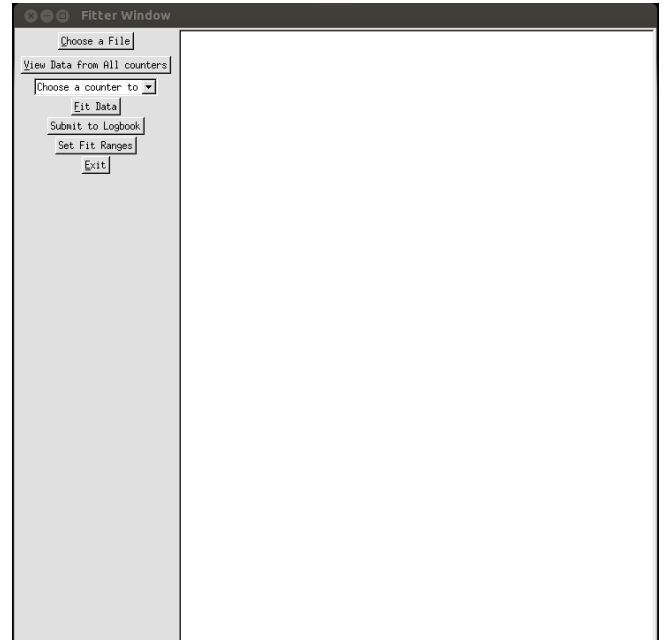
Rafayel Paremuzyan

October 25, 2021

For performing the harp scan, follow instructions in chapter 3.5 of the beamline manual. The analyzer can be open from the harp scan GUI using “Analyze” button. The general view of the fitter application is shown in Fig. 1. On the main screen there are 7 buttons, names of each button gives hint to it’s function:



(a)



(b)

Figure 1: Left: The harp scan GUI. Right: General view of the fitter application.

- “Choose a File” - Allows selection of harp scan file, if file is not selected, analyzer will fit the latest scan.
- “View data from All counters” - pops up a window where user can see responses from all counters. This is useful if you want to check, if harp scan went correctly.
- “Choose a counter to Fit” - Allows the user to select a counter, for fitting.
- “Fit Data” - Performs the fitting of the selected counter.

- "Submit to Logbook" - Allows the user to send fit results to logbook, and updata MYA database with fit results.
- "Set Fit Ranges" - Allows the user to manually adjust fit ranges for each wire. This is helpfull, when the standart "Fit Data" function fails to fit data.
- "Exit" - Exits the program.

1 Fitting the data

If you have the screen on Fig.1b open, then to analyze recent harp scan data, you first need to select the halo counter from the drop-down menu "Choose a counter to Fit". If you are not sure which halo counter is better for that particular harp, look into Section 3 "**Suggested counters**". As soon you select the halo counter push the "Fit Data" button, and if everything is alright, it should fit. If harp is 2c21, you should see 2 peaks, as shown in Fig.2a. If you fit tagger harp, or harp 2H01, then you should see 3 peaks as shown in Fig.2b. All harp scans (unless it is not usable) should be submitted to Logbook.

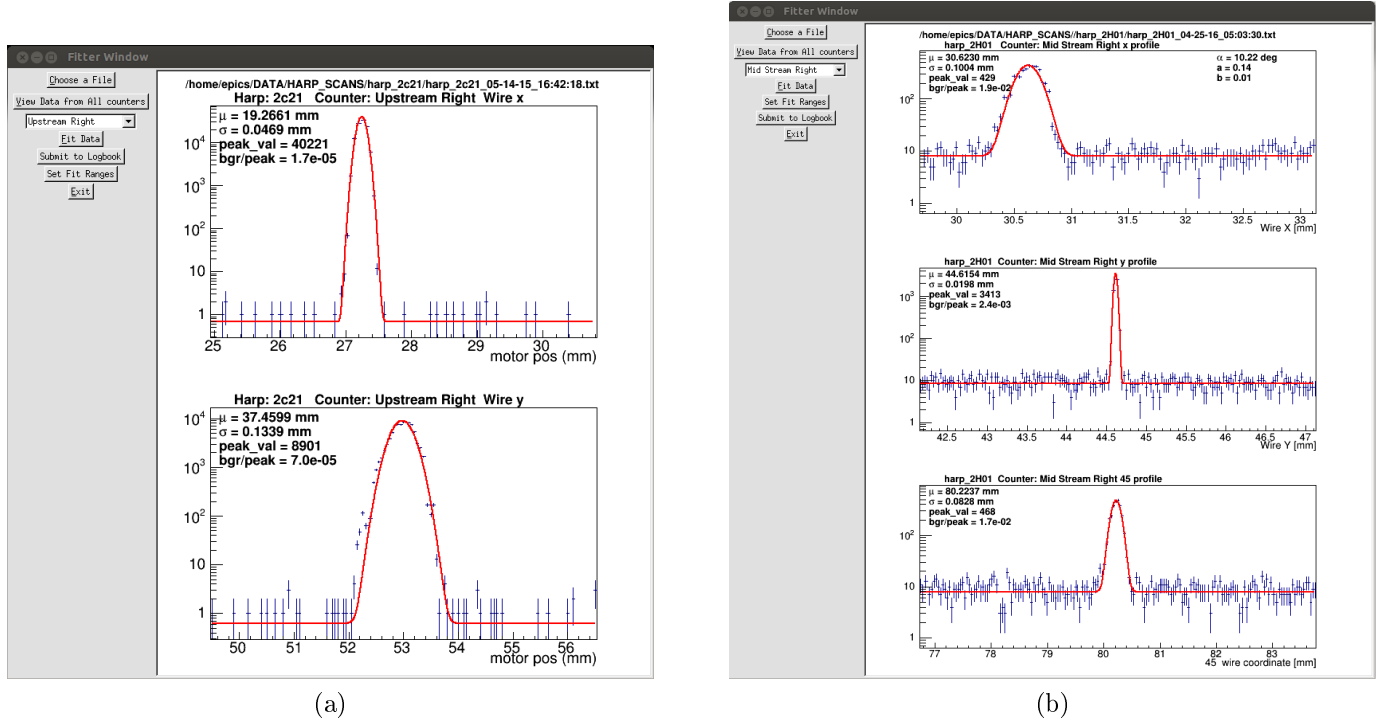


Figure 2: Examples of fits. Left 2 wire harp shows only 2 peaks. Right an example of 3-wire harp data fit, tagger harp or 2H01 harp. Should be 3 peaks.

2 Submit the fit results to Logbook

To submit the analyzed results to logbook, push the "Submit to Logbook" button in the main window. A window similar to Fig.3 will pop-up. Make any relevant comments if needed, then from check-boxes choose logbooks to send. By default "HBLog" is selected, which is the primary logbook for Hall B experiments. Choosing ELog, the log entry will appear in the accelerator logbook as well. "TLog" is logbook, which is

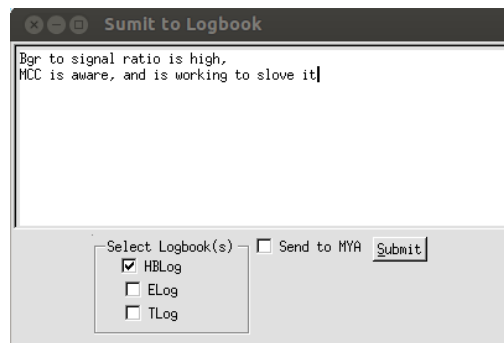


Figure 3: Submit to logbook window, where you can make comments, chose which logbook to send, and also you can choose whether send fit paramaters into MYA database.

used only for testing purposes. **ATTENTION: please check the "Send to MYA" box, if you are analyzing the most recent harp scan data, otherwise don't check that button.**

3 Suggested counters

These are suggested counters for each harp.

- for 2c21 harp, use Upstream-L or Upstream-R, Choose the one which shows less background/signal ratio.
- for harp tagger, when Tagger magnet is "On", use Tagger-Left, Tagger-Raight or Tagger-Top, otherwise use Midstream-bot, Midstream-Left, Midstream-Right, Midstream-top. Choose the one which hass less background/signal ratio
- fot 2H01 harp, use Downstream-Left, Downstream-Right, Downstream-Bottop, or Downstream-Top, choose the one which hass less background/signal ratio.

4 Problems with fit

- If it shows only one graph, and there is no fit in it,

This means in the data, the fitter didn't find correct number of peaks. First check with "View Data from All counters" button, if there are correct number of peaks (2 for 2c21, and 3 for tagger and 2H02A harps). If number of peaks is incorrect, this mean harp scan didn't go correctly, you should do scan again, and make sure you have correct number of peaks. **ATTENTION: if you don't exit from the application, then you have to load the new file using the "Choose a File" button. (see section 5Loading a File to analyze, after then do a fit).** However, If number of peaks is correct, but the fitter is not able to fit, try to set fit ranges manually. See section 6 **Setting Fit ranges Manually**

5 Loading a File to analyze

If you would like to analyze some particular file, push the button "Choose a file" then as shown in the Fig.5, 1st select the directory of the harp, that you want to analyze, then from that directory select the file, and open it. Now you can fit it with "Fit Data" button.

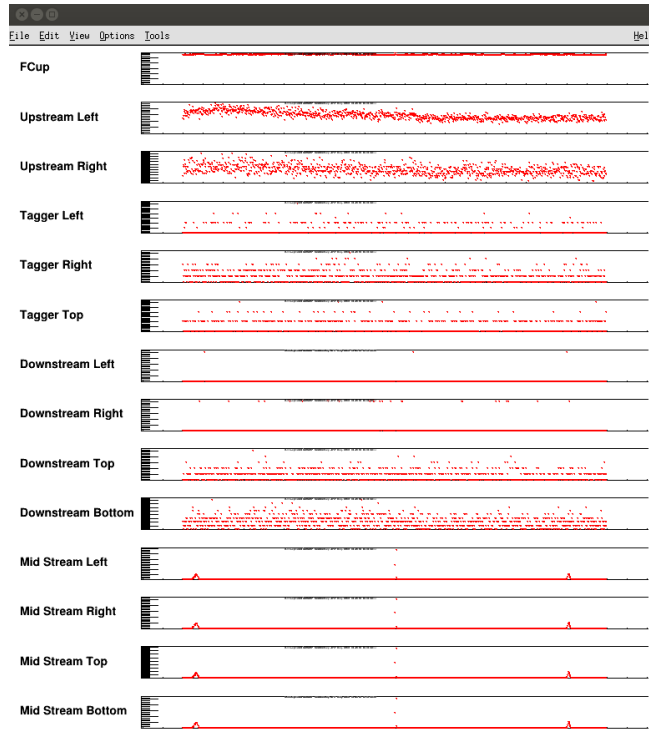


Figure 4: An example showing a window of Data from all counters.

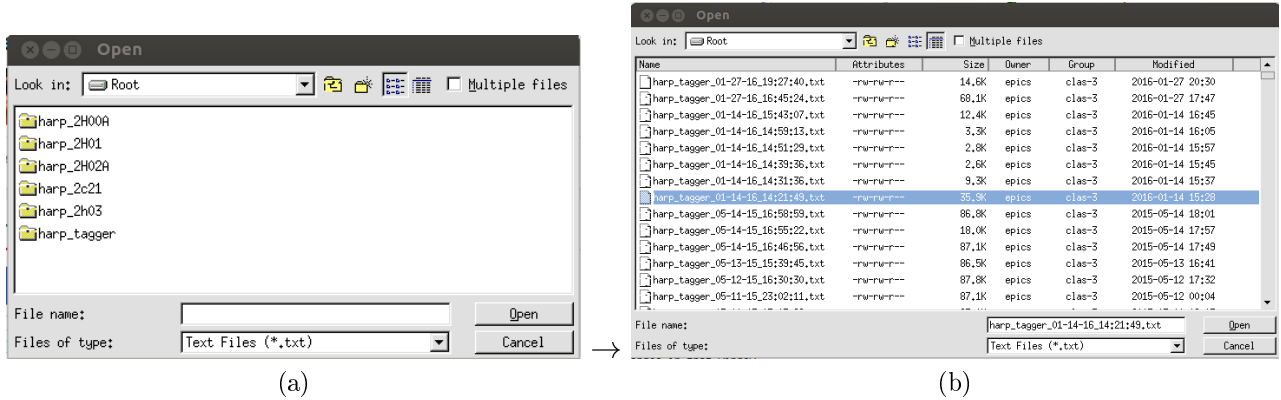


Figure 5: Chose a harp scan data file to fit. Left: choose the directory of the harp. Right: chose your desired file and press "Open"

6 Setting Fit ranges Manually

Sometimes it happens that the fitter is not able to find correct peaks. In this case the user can give left and right limits of each peak, to aid the fit. In order to do that, you should push the button "Set Fit Ranges" in the main window. and a new window will pop-up which will look like the one in Fig.6. Default values for left and right limits set such it will include the peak, however, the actual beam position may change, and the user should make sure that the peaks are inside the selected ranges, and then Fit with a "Fit" button, which is under ranges in that window.

- If still it doesn't fit.

Try narrowing widening fit ranges, after few trials, if it doesn't work, then contact the slow-controls expert.

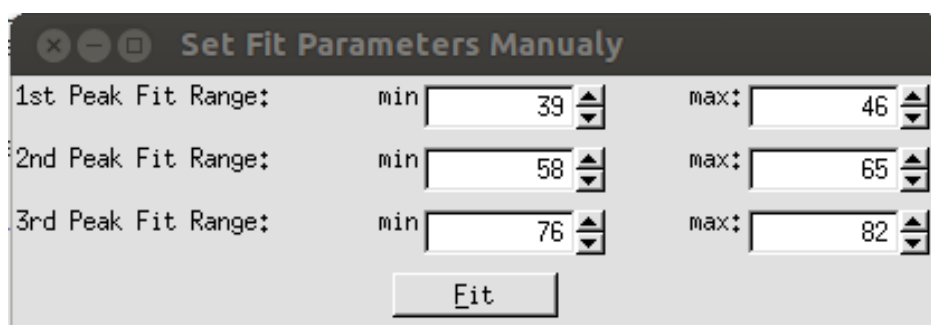


Figure 6: With this window user can set left and right limits for each peak.