Hall C User Howto

Superharp Operation

M. K. Jones

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Abstract

Describes how to take and analyze superharp data.

1 Introduction

This document is derived from the G0 superharp How-to by Junho Yun.

For more information about the super harp system, see the reference "Hall C Superharp System" [1] by Chen Yan.

2 Data taking

1. Make sure beam is stable and 5 μA or less. For rastered beam one can use up to 10 μA , but first try with 5 μA. Let MCC know that you are planning to do a scan.
2. *ssh cvxwrks@cdaqh1* with cdaq password
3. *cd g0superharp*
4. *cd scan_data/spring03* and make a new directory for the new date and run number of the data run. e.g. mkdir apr_01_03_runnumber
5. *cd ../..* , so you are in the g0superharp directory.
6. type *harp_launch*

7. In the GUI click on Calculate and choose Scan. A small medm window will appear. Click on the *execute* button and then open the file *Harp_MEDM/g0superharp.adl* using the *file* menu. Then you will get a GUI with the Superharp. For each superharp scan desired.
   (a) Click on blue button near desired superharp
   (b) Another gui pops up, click on the red scan button and then wait until "Declared zero point harp position" is displayed. Kill screen after scan is done.
8. Now from the main GUI type *spring03* in the Experiment window and the directory name (that you set above) in the Filename window.
9. Click on File menu and select Load New Data.
10. Click on yellow button with one of the harp names and select from the list which harp you want to look at. To clear screen click on File menu and choose Reset.

3 Analyze harps near target

1. Assuming that you are in the g0superharp directory on cdaqh1
2. Type: make_harp_file *directory_name run_number*
3. Type: use cernlib/2000
4. Type: paw
5. Depending if beam was unrastered or rastered. If the beam was unrastered and one wants to fit with a Gaussian then add *fit=yes* when execute plot_harp.kumac in next step. If the beam was rastered then execute with *fit=no.*
6. In paw++ Executive window type: exec plot_harp harpname=IHA3H00_*runnum* fit=*yes or no*
7. A plot of the raw harp scan is shown. Click with left mouse to make gates around each peak. Click the right mouse to quit. The first peak is the x1 wire, the second is the y wire and the third is the x2 wire.

The program has offsets for each wire (for spring 2003 these were determined by comparison to the BPMs). For each of the following plots, the offset for that wire is subtracted from the raw data and for the X1 and X2 the sign is reversed to agree the BPM sign conventions.

8. Then the x1 plot appears. If not doing a fit the left click at the lower left, center and upper left of the peak (click with right mouse to quit). The kumac will return the difference between the first and last position and the center position. For a fit make a click in the flat region below the peak, at the left base of the peak, at the top peak (the y position is used as the starting height), at the right base of the peak and in the flat region above the peak . The fit is a constant background plus a Gaussian. Unfortunately fitting with PAW can sometimes have problems, and you just have do it again. If you get a negative number for sigma you can just take the absolute value since PAW uses the square and is insensitive to the sign. All units are mm.

9. Then the y plot appears. Do as for x1 plot.

10. Then the x2 plot appears. Do as for x1 plot.

References

[1] C. Yan. Hall c superharp system. `http://hallcweb.jlab.org/document/howtos/HKS/superharp_system/`. HKS Reference.