Hall C User Howto

Hall C Beam Energy Measurement

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Abstract

MCC does the beam energy measurement. It is important for the user to make an hclog entry as documentation.

1 MCC energy measurement

MCC follows a standard procedure[1] for doing the Hall C beam energy measurement. The basic idea is to setup a dispersive tune. Setting up a clean dispersive tune is usually what takes the most time. Then MCC adjusts the current of the arc dipole string (MBSY3C) to center the beam at the end of the arc on IPM3C17H. From the current one can calculate the beam energy assuming the beam follows the central path. By measuring the positions and angles at the entrance and exit of the dipole arc one can correct for small deviations for the central path. To measure these positions superharp scans are performed 3C07 and 3C17 positions. The beam current for the harp scans is 10 μA.

2 Making an hclog entry

It is important for the user to make an hclog entry. The user should log the following information.

[1] http://opsntsrv.acc.jlab.org/ops_docs/online_document_files/MCC_online_files/HallC_energy_measure_proc.pdf

1. The current of the arc dipole string MBSY3C.

2. The Elog entry number of the *Hall C Energy Measurement* screen that MCC should make. An example is Elog entry 1134263[2].

3. The Elog entry number of the *Hall C Superharp Analyzer* screen that MCC should make. An example is Elog entry 1134260[3].

4. The uncorrected and corrected beam energies from the *Hall C Superharp Analyzer* screen. One can calculate the uncorrected beam energy using the current of the arc dipole string MBSY3C and the program *magnet* in the directory *Beam_Energy* in the cdaq account on the cdaql1 machine. An example session is :

```
cdaql1.jlab.org> pwd
/net/cdaqfs/hallc/home/cdaq/Beam_Energy
cdaql1.jlab.org> magnet
Include extrapolation uncertainty (<y> or <n>) ? :
y
do you want to do a calculation (<y> or <n>) ? :
y
enter current (amps) : 126.41194
Current: 126.41194 A
Bdl =  756226.317 Gauss.cm
P = (3.02898 +/- 0.00122) GeV/c
do you want to do a calculation (<y> or <n>) ? :
n
```

5. The values for the epics variables *halla_MeV* and *hallc_MeV* . These values have been calibrated to previous energy measurements in Hall A and C and have been accurate in the past. To get the values do the following on a cdaq computer:

```
cdaql1.jlab.org> caget halla_MeV
halla_MeV                    5008.97
cdaql1.jlab.org> caget hallc_MeV
hallc_MeV                    3028.39
```

[2] http://opweb.acc.jlab.org/CSUEApps/elog02/elog_item.php?elog_id=1134263
[3] http://opweb.acc.jlab.org/CSUEApps/elog02/elog_item.php?elog_id=1134260