Data Analysis Plan for the 1st Period GDH Data

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The GDH Experiment E97-110

Goal:

to measure the generalized Gerasimov-Drell-Hearn (GDH) sum rule at low Q^2 on the neutron and ^3He

Experiment:

to measure the inclusive $^3He(e,e')X$ reaction by using polarized electron beam and the polarized ^3He target

To form the extended GDH integral, both the asymmetry and cross section need to be extracted .

Time of data taking:

in April-May (1st period) and July-August(2nd period) 2003

The GDH Experiment E97-110 (contd)

E97-110 was the first experiment to use a septum magnet.

The left septum was not available, so the left HRS could not see the ^{3}He cell and was used as a luminosity and beam false asymmetry monitor on a separate carbon target.

1st period run: The septum was found to be mis-wired during the commissioning. Low beam energy data were taken during this period. The large rates at forward angles and low beam energies compensated for the acceptance loss. The data did not suffer loss in statistics.

2nd period run: The septum was fixed in June. 80% data of the plan were taken. Online analysis showed a good data quality and good understanding of the background.

Data Analysis of 1st Period Data

People hope the 2nd period data analysis will provide valuable experience for the 1st period data analysis.

The 1st period data analysis includes:

spectrometer optics analysis;

target analysis;

scalar analysis (beam current, deadtime correction…);

particle identification and detector analysis;

acceptance study using carbon data;

elastic analysis;

background study and MC simulation;

extraction of the raw cross section and asymmetries;

radiative corrections;

extraction of physics quantities: the extend GDH integral, the spin structure functions g_1 and g_2.

USTC group for GDH data analysis

At present, USTC group's effort at JLAB is mainly concentrated on the 1st period GDH data analysis.

People for this work:

Yunxiu Ye, (faculty, work experience on HERMES)

Yi Jiang, (faculty, work experience on D0, Fermilab)

Haijiang Lu, (postdoc, work experience on HERMES)

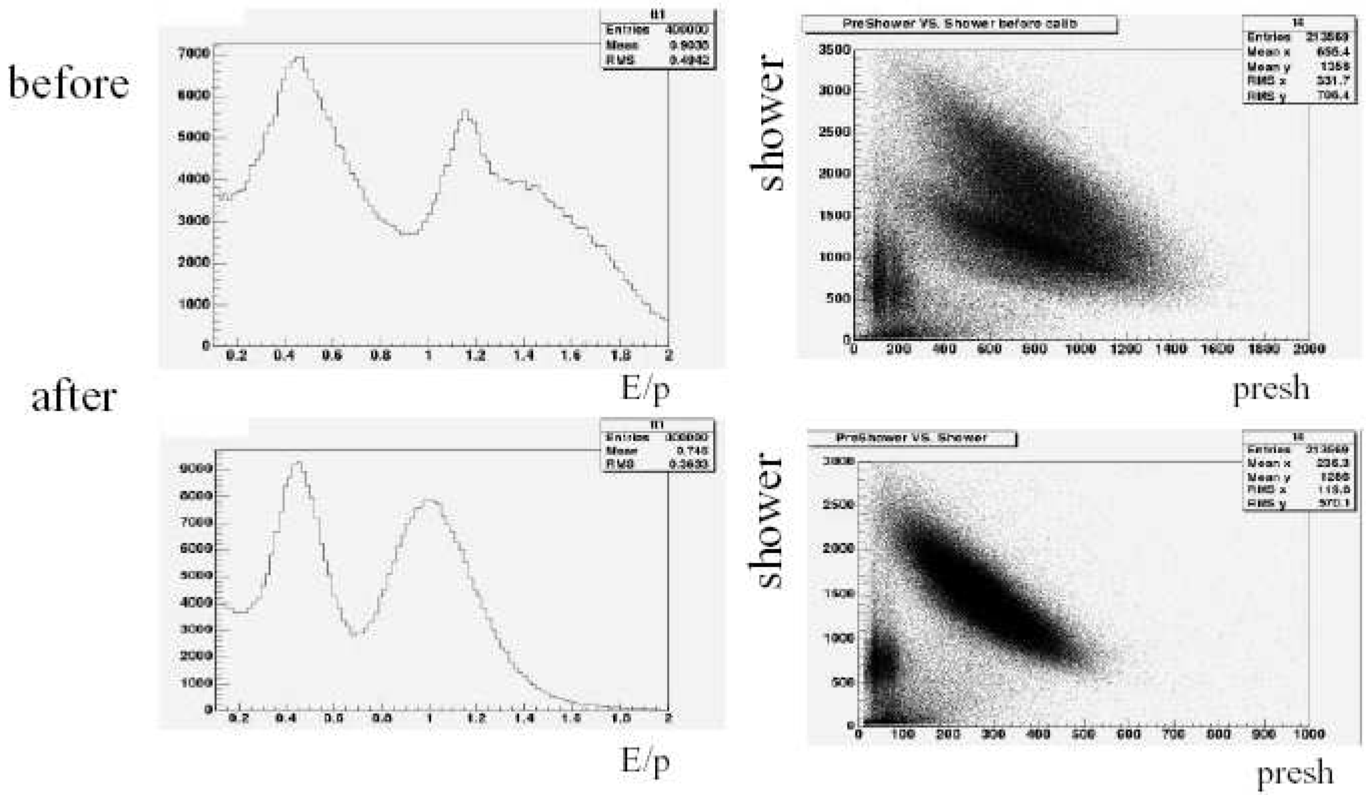
Xinhu Yan (graduate student, available in Sep.)

Peng Yan (undergraduate student)

We will mostly work off-site for it, and people will travel to Jlab for discussion regularly. If it is available, a graduate student is expected to be on-site for the ph.D thesis.

USTC is working on 1st period data

Haijiang is working on the particle ID and the calibration of preshower and shower detector.



Run#4202
P=1.7GeV

Preliminary result!

Plan of 1st Period Data Analysis

groups will be responsible for these analysis:

spectrometer optics analysis (?);
target analysis(?);
scalar analysis (?);
particle identification and detector analysis (USTC);
acceptance study using carbon data (USTC);
elastic analysis (USTC);
background study and MC simulation (USTC ?);
extraction of the raw cross section and asymmetries (USTC);
radiative corrections (USTC);
extraction of physics quantities (USTC)