Status of the Compton polarimeter

latest news

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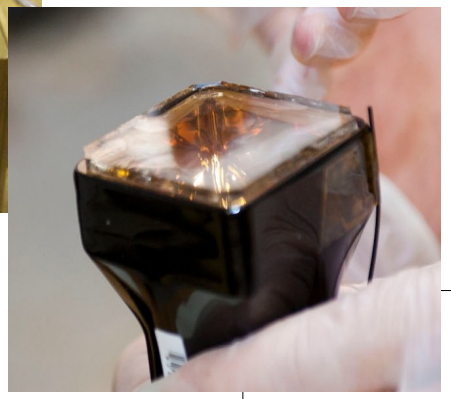
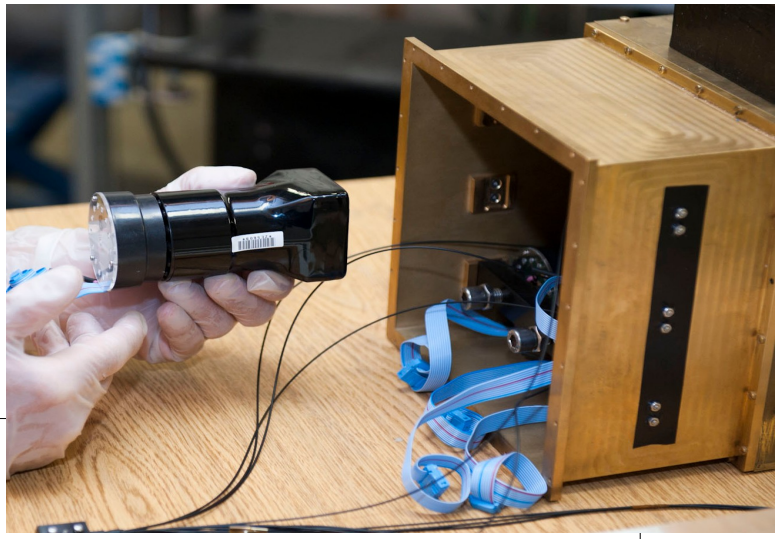
Work in progress

Overview

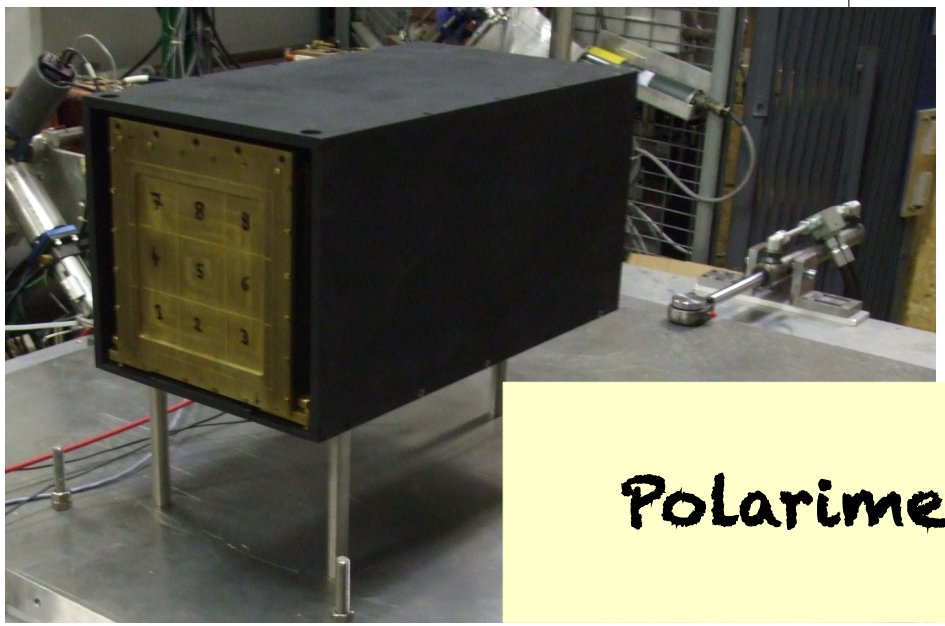
- Polarimeter assembling
- First tests
- LED source
- From 1 to 16 cables
- Runs with gamma source
- Runs with cosmic trigger
- ToDo list

Polarimeter assembling





- Brass box
- Crystals
- PMTs & optical fiber
- Hydraulic jack



Polarimeter in place!

First tests

After the assembling

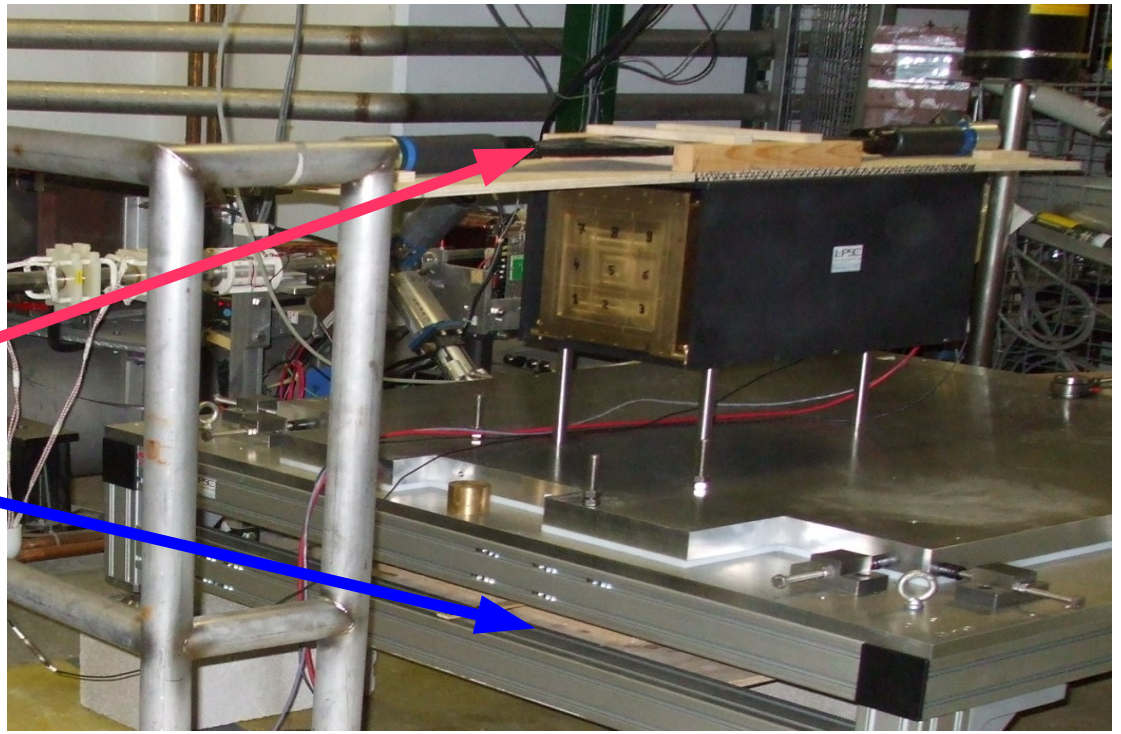
- All PMTs singly tested
- All PMTs tested with LED signals (with and without preamplifier) at 1 Hz
- First long run with only one cable and DAQ on

During accelerator cablage

- All channels tested together for the calibration. 2 runs: 1 with LED and 1 with gamma source (^{137}Cs) per channel
- First run with cosmic trigger (only 2 PMTs)

LED, ^{137}Cs & cosmic runs

- Measurements done testing all the acquisition chain (PMTs -> DAQ -> Monitoring)
- PMTs at the nominal voltages
- "*sample*" mode measurements
- Cosmic trigger obtained with signal from at least 2 scintillators



ToDo List

Good progresses,

lot of work done...

but...

...there is a lot of work to do

https://positron.jlab.org/wiki/index.php/PEPPo_Compton Transmission_WG

ToDo List (2)

Calibration tests

- Scintillator calibration with beta source (^{90}Sr).
- ^{137}Cs measurement with analyzing magnet ON/OFF.
- Comparison of the crystal resolution (with fadc and ^{137}Cs source) in "sample" and "semi-integrated" modes.
- System linearity study with different gamma sources and LED
- Absolute crystal calibration with cosmics and comparison with gamma source results in both data taking modes

ToDo List (3)

- PMTs relative gain vs HV for all the crystals.
- System stability measure with a long LED run and 137Cs (central crystal).
- Cosmic event study
- LED signal stability study.
- Asymmetry measurement (at least 2 crystals). source test using true helicity signal with and without delay (with Riad)
- Asymmetry width without signal.

<u>DAQ</u>

- Electronic diagrams for all the configurations.

ToDo List (4)

- Noise study induced by the amplifier and the linear fan.
- Dead-time estimation and measurement.
- Implementation delayed helicity
  http://hallaweb.jlab.org/equipment/daq/qweak_helicity.html
- Implementation of the scalers
- Wiki entries for cosmic trigger and LED settings.
- EPICS & Logbook
- Decoding histograms.

- Analysis and simulation
- Anything else...?

...at least

Infoes for general runs:

- All data are store in a common directory on "opsmdaq1" /data/compton/
- All the tested programs for the general data taking & analysis are in /usr/itsdata/positron
  https://positron.jlab.org/wiki/index.php/PEPPO_Software_and_disks_locations

Fixed location for general data taking (ex. long runs) for PEPPo!!!
It is the MCC pc "opsl03"

Thanks Joe!