Forward neutron pPPG

2009/06/09

Manabu Togawa

Today's issues

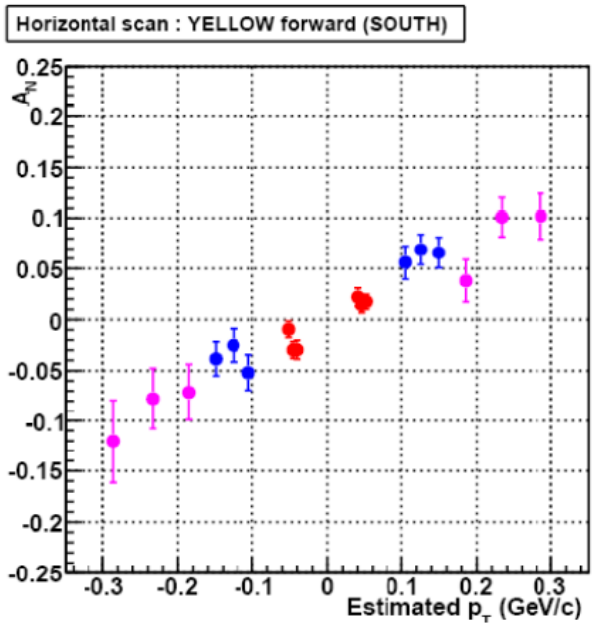
- To do list
  - Publication for 200 GeV data
    - Cross section (maybe rough.. Ignore pT-shape?) and asymmetry
  - Preliminary for sqrt(s)-dependent A_N
    - Use 62, 200 and 500 GeV
- Time range
  - Including other work (silicon work)

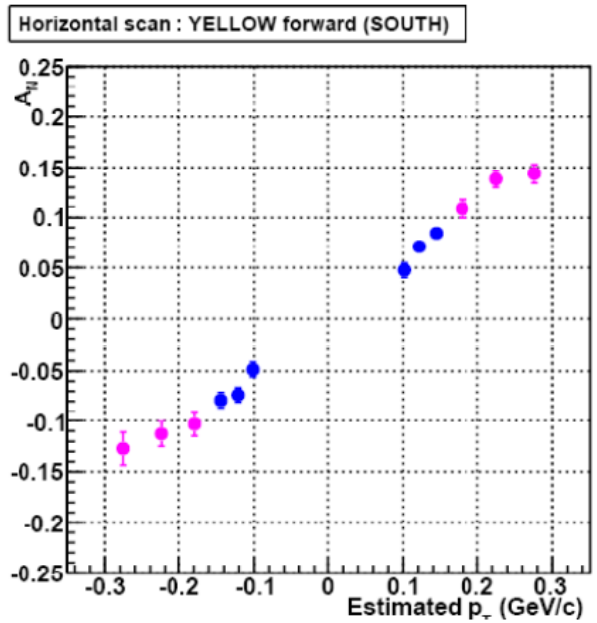
Publication for 200 GeV data.

- Problem is still in p_T shape
  - Currently use ISR shape ($d\sigma \sim A*\exp(-4.8*p_T)$). But it is not true.
  - Need to do more simulation study with HERA shape.
    - Difference will be systematic?
  - Comparison with ISR data?... Need to think about it.
- First, will prepare draft.
  - Target : Phy. Rev. D
  - Use example from Nucl. Phys. B 776 (2007)1-37

Preliminary for sqrt(s)-dependent A_N

- It is really interesting result.
  - https://www.phenix.bnl.gov/phenix/WWW/p/draft/togawa/AN/ForwardNeutronSqrtSDep/ForwardNeutron_AN_varusou_ene.pdf
- In previous analysis,
  - 410 GeV was unstable beam
    - Use 500 GeV. Large amount of data!
  - Asymmetry calculation by luminosity formula is unstable using BBC count as relative luminosity
    - Use square root formula for the result.





Other work (I will do)

- Silicon strip production
  - This will be at Fermi Lab.
  - I will do readout check after ADC chip mount, sensor mount and encapsulation
  - Starting at begging of July.

  - But I think I can do neutron work in parallel.
    - Works above will be less than 8 hours
    - Saturday and Sunday will be holiday.
      - The works will be taken by Fermi Lab. technicians except for me and SUNY student.

Schedule

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                                  Jun.    Jul.    Aug.    Sep.    Oct.    Nov.

200 GeV publication                         <----------------------------->
prelim. fpr sqrt(s)-dep. AN       <------>

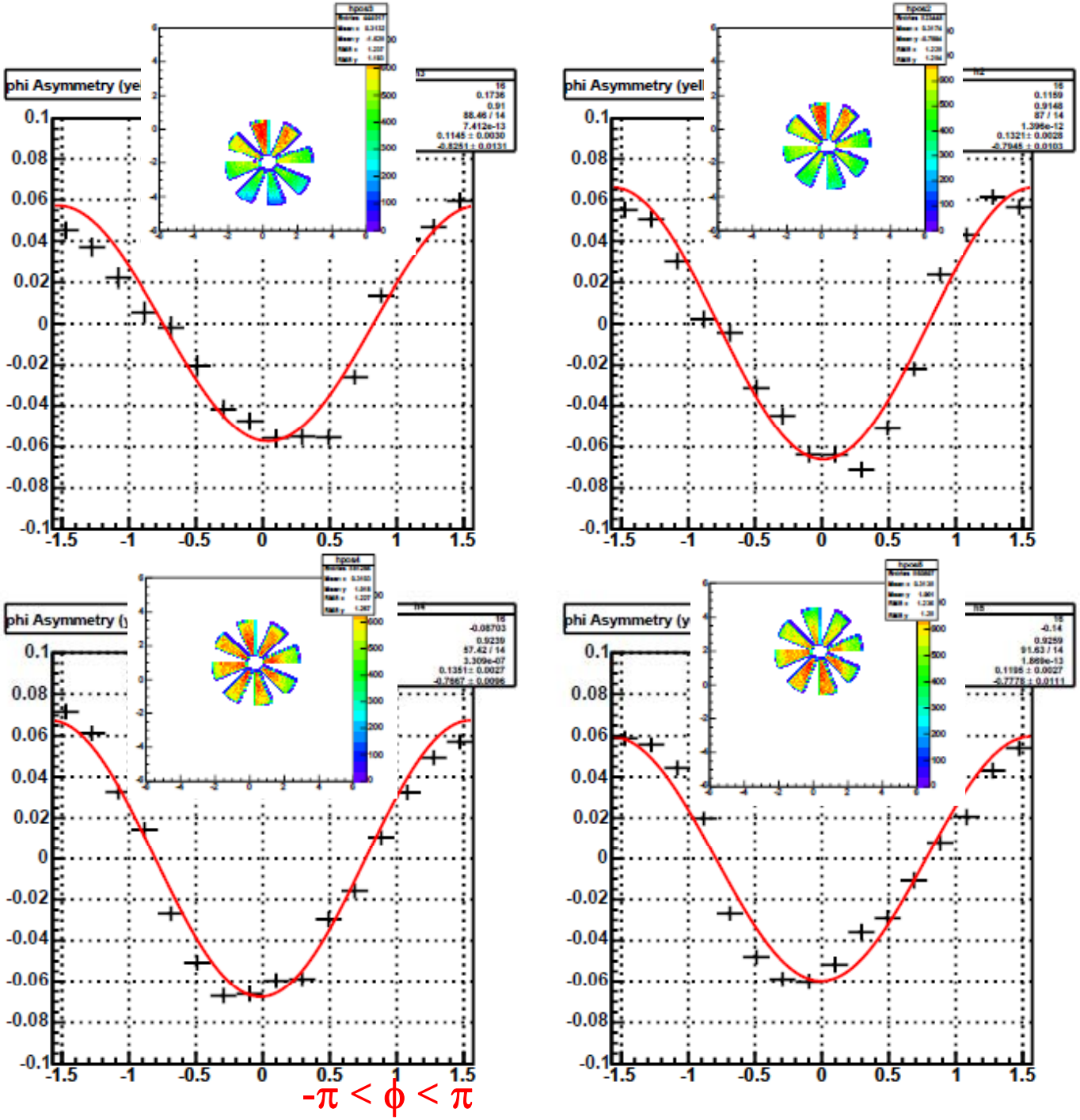
silicon prepare (BNL)             <------>
silicon mass pro (FNAL)                     <----------------------------->
```

- Will tale preliminary for sqrt(s)-dep. first.
  - I will not be in BNL from July.
  - 200 GeV publication draft will be middle of Jul.
- Other schedule
  - Will go to Kyoto to join RHIC-spin seminar. (6/30-7/4)

500 GeV analysis

- The data is already generated during local pol. Commissioning time.
  - Calibration is done.
  - Solved ZDC/SMD correlation
- Analysis is started
  - Center scan by luminosity formula.

Phi-dep. asymmetry scan for y-position by simulation

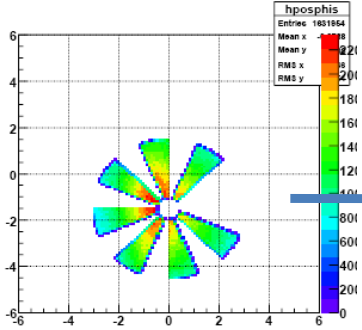


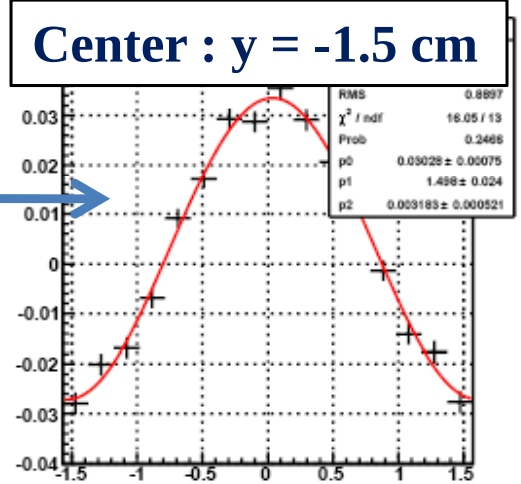
Lumi formula

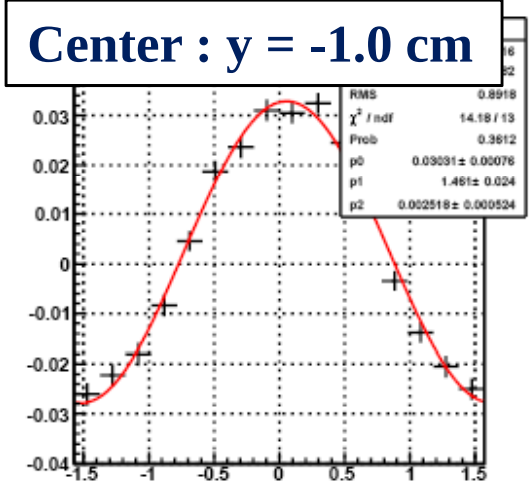
AN = (NL-R*NR) / (NL+R*NR)

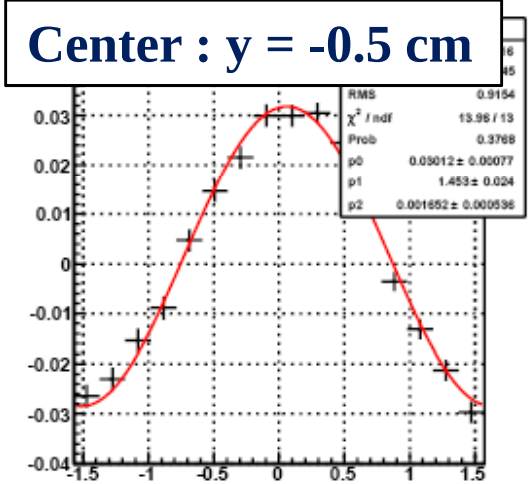
Beam center : y=0 for the simulation input.

→ We cannot see any differences of sine curves in phi-dependence by sqrt formula.
→In RUN5 data, statistics is not enough



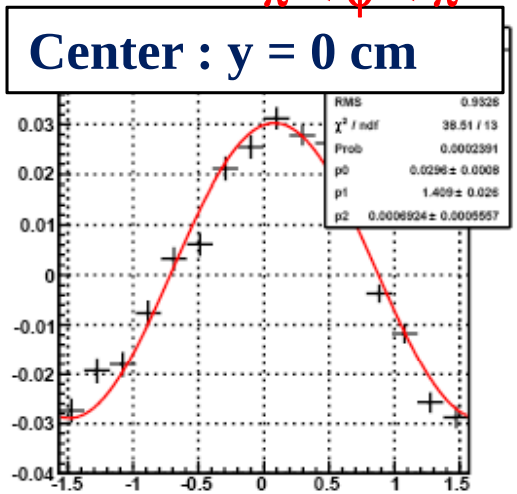


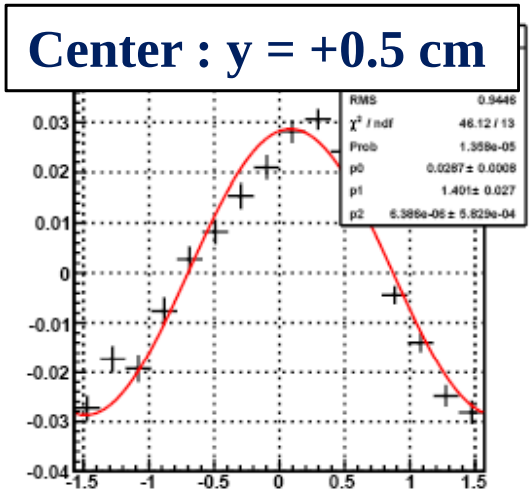


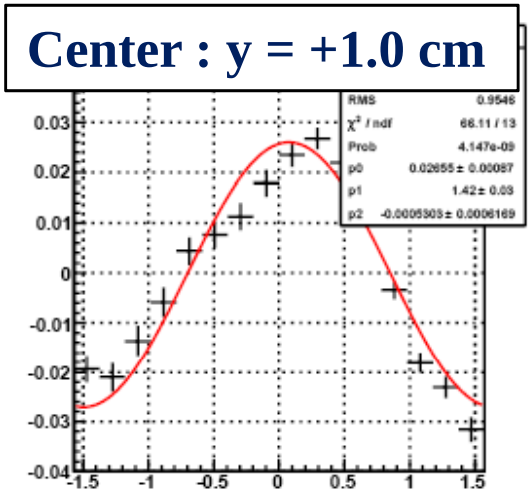


500 GeV data (Fill#10373)

$-\pi < \phi < \pi$







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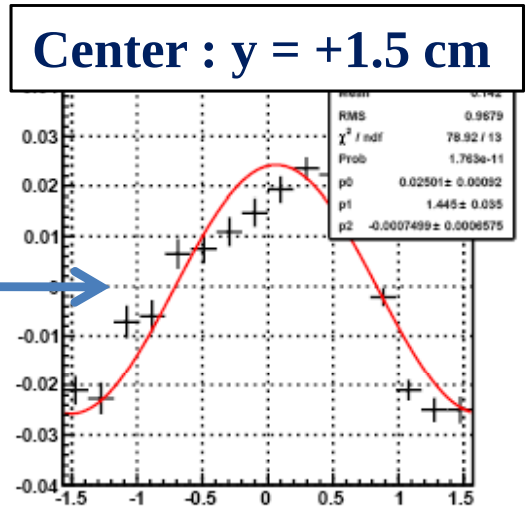

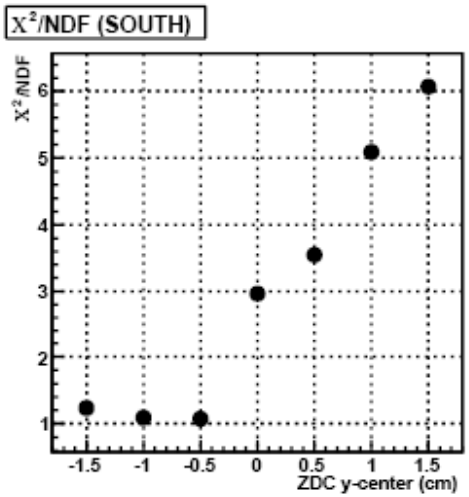

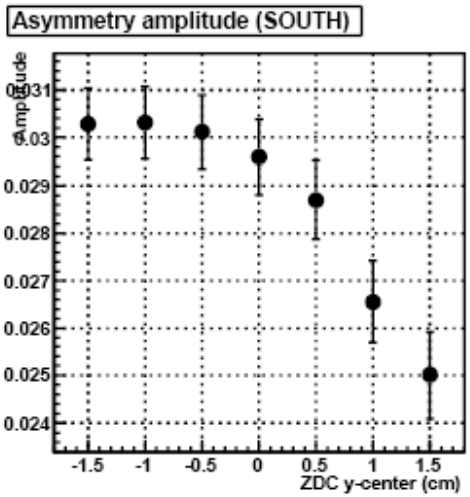

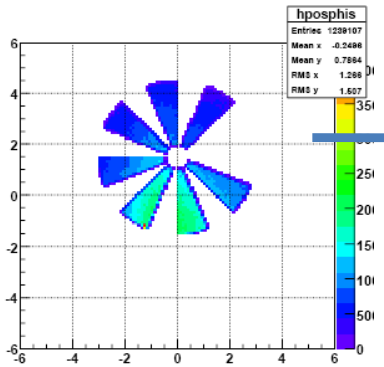

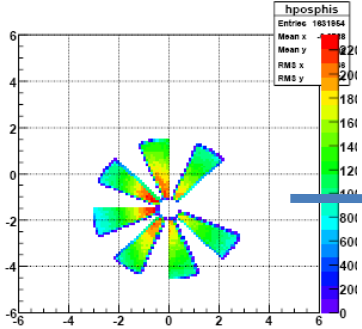

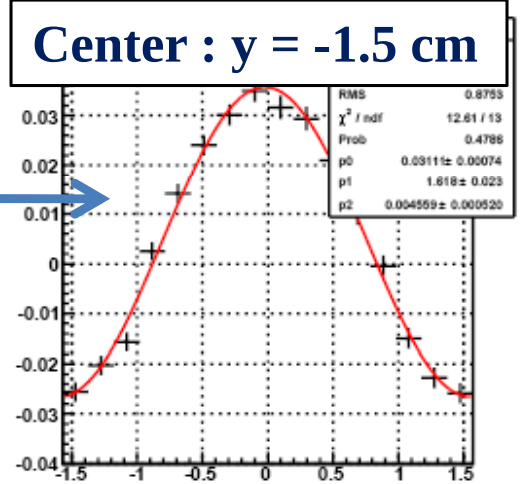

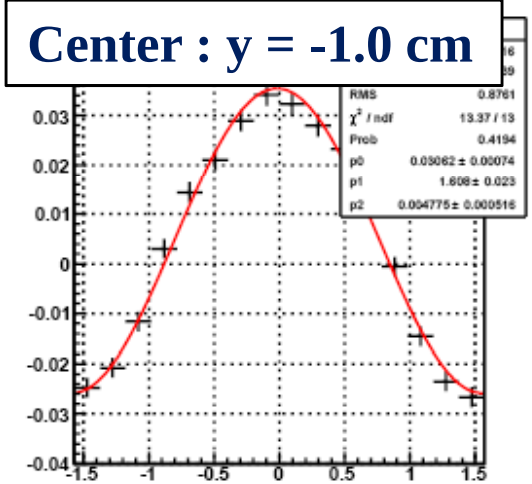

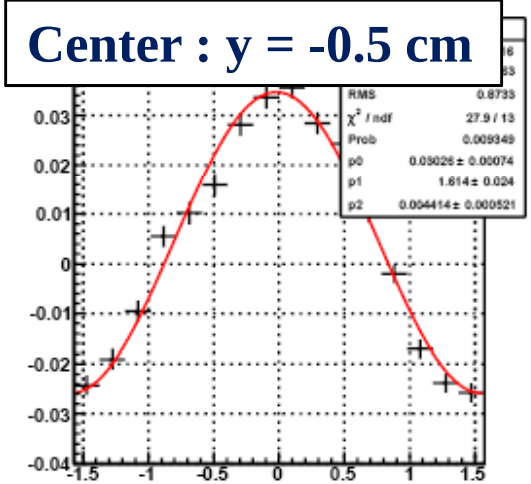

500 GeV data (Fill#10373)

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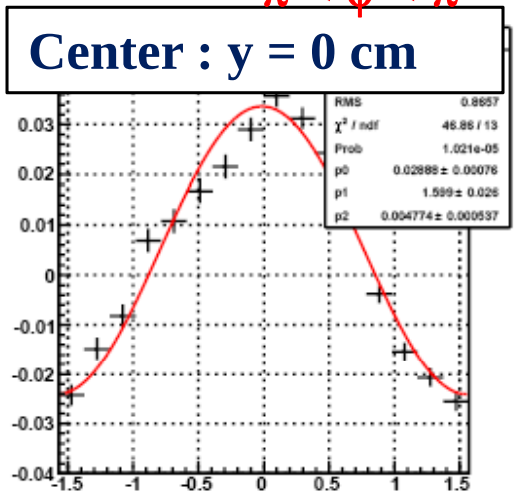
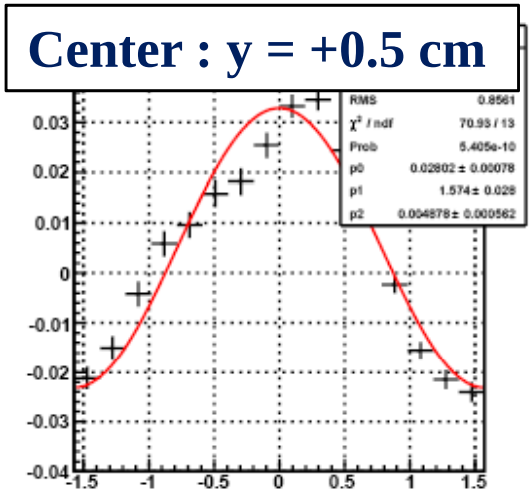
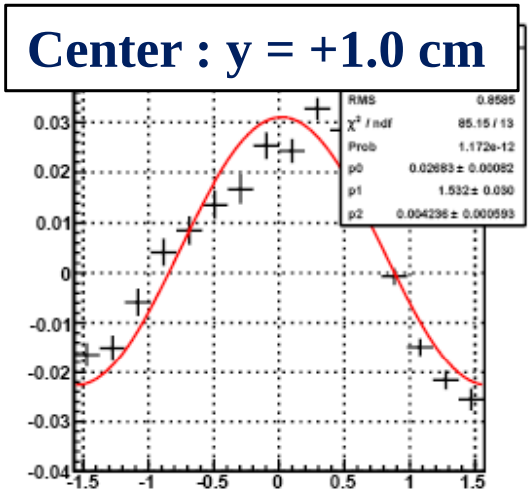
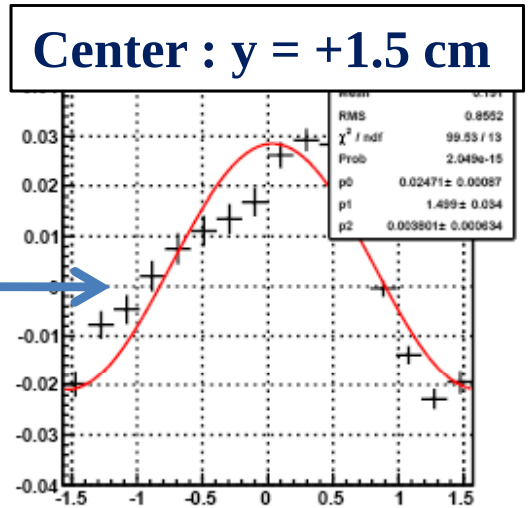


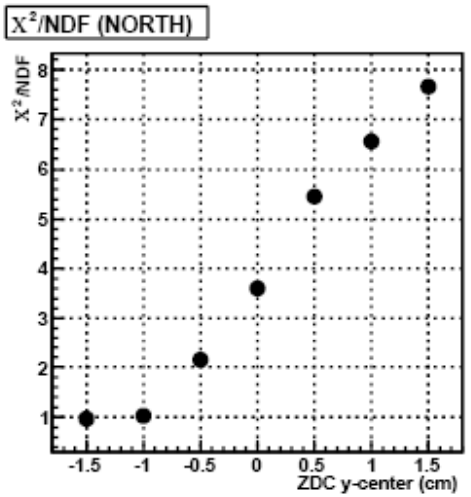


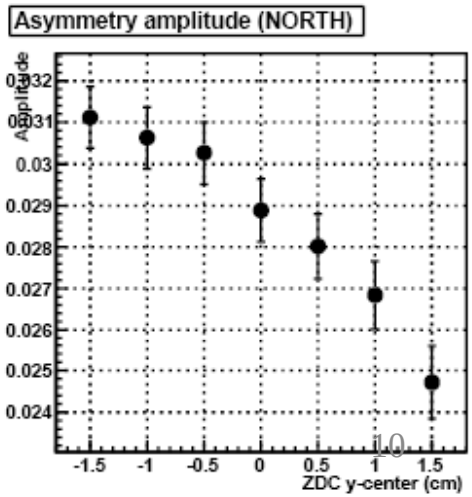


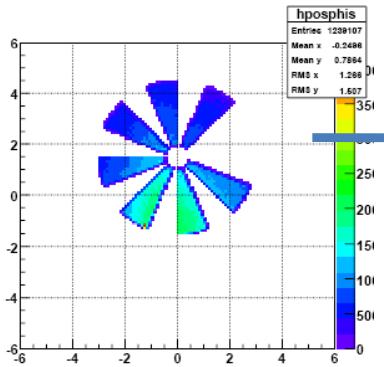
NORTH side

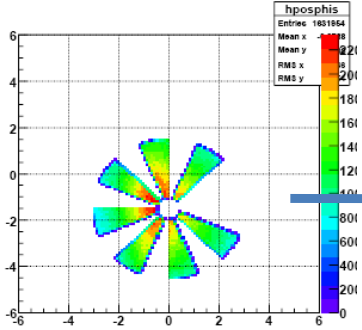
Scan is just in y-direction.

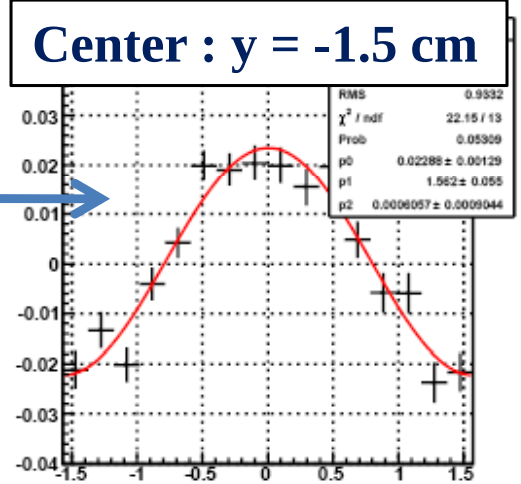


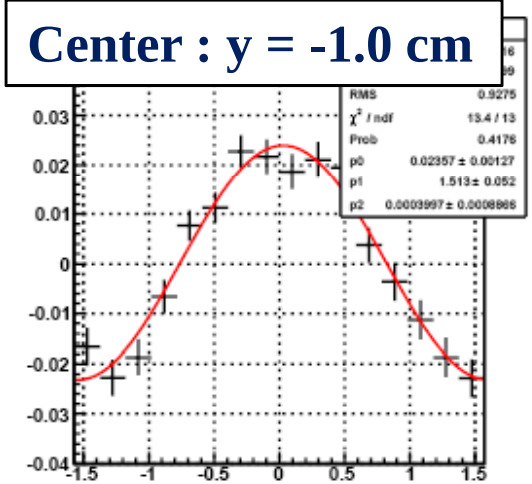


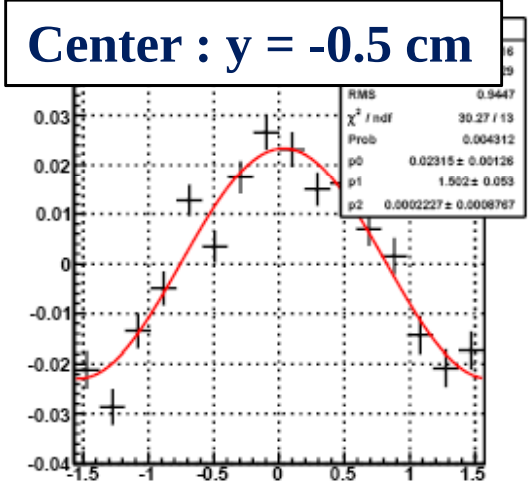






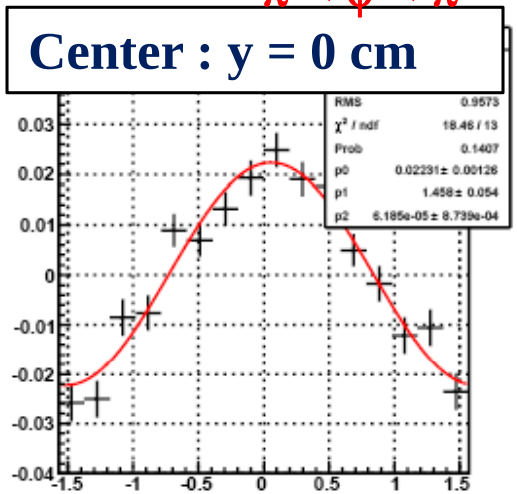


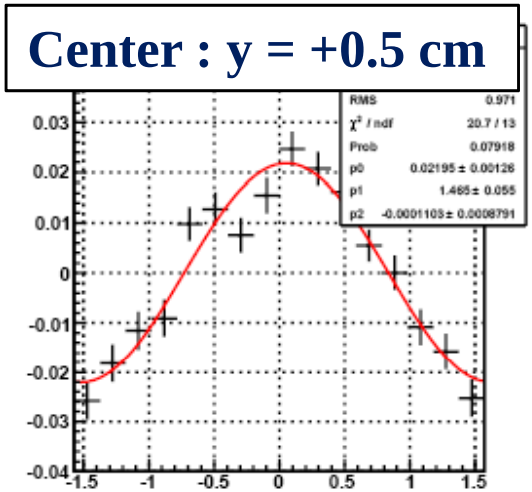


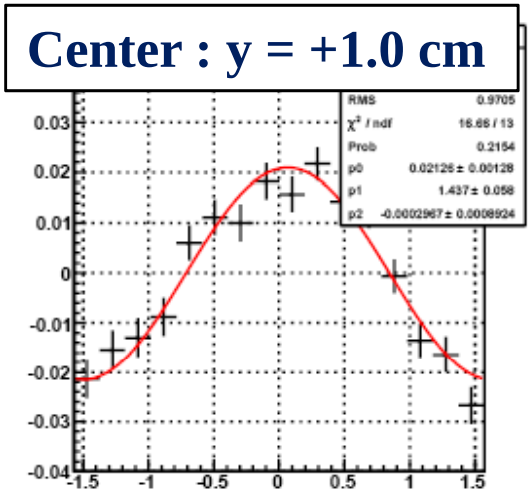


200 GeV data (Fill#10629)

$-\pi < \phi < \pi$

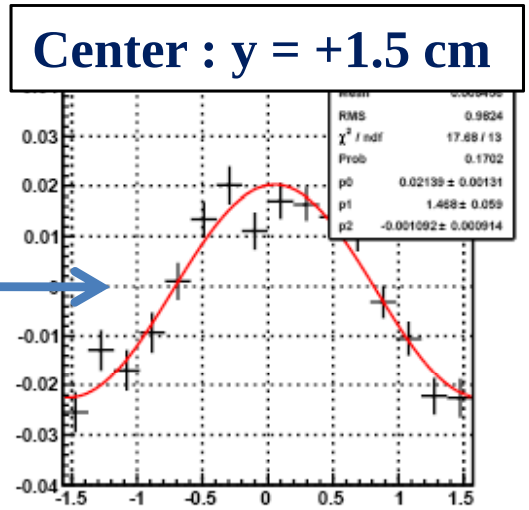


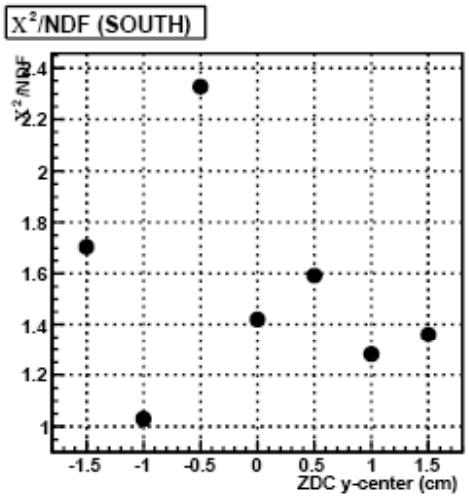


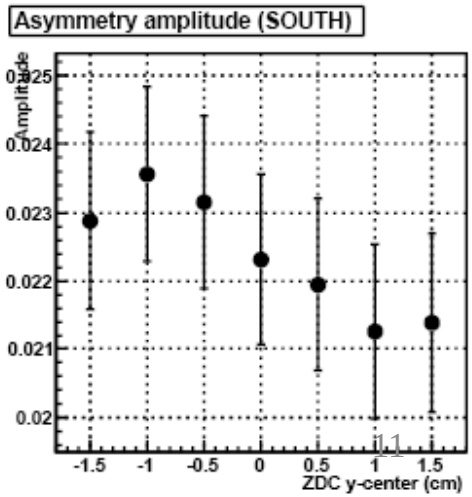


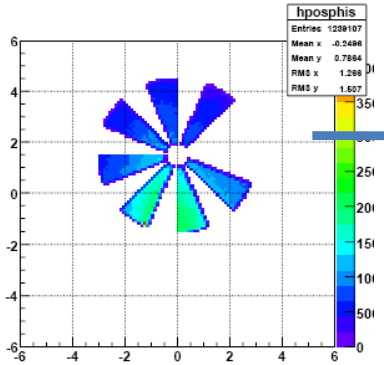
SOUTH side

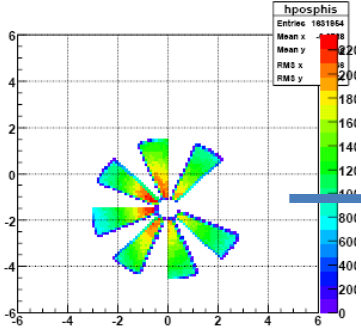
Scan is just in y-direction.

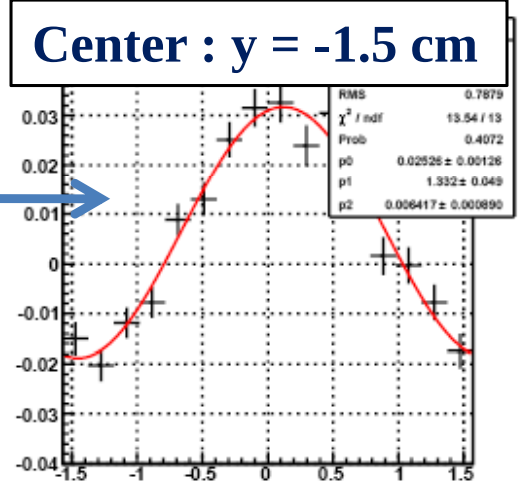


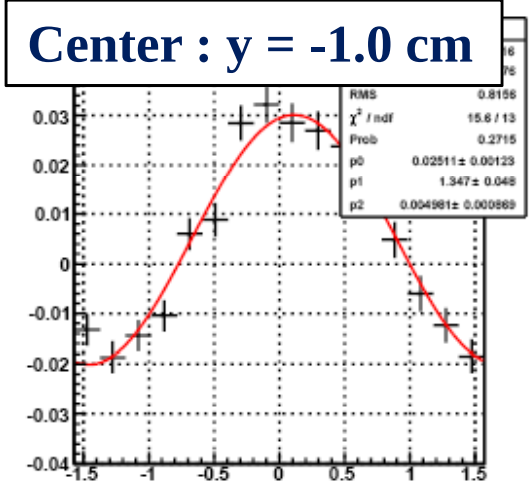


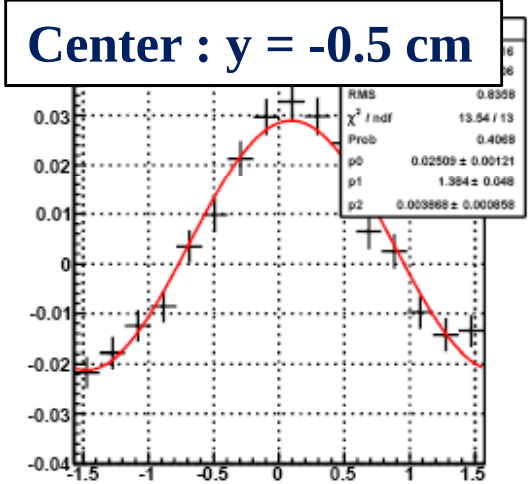










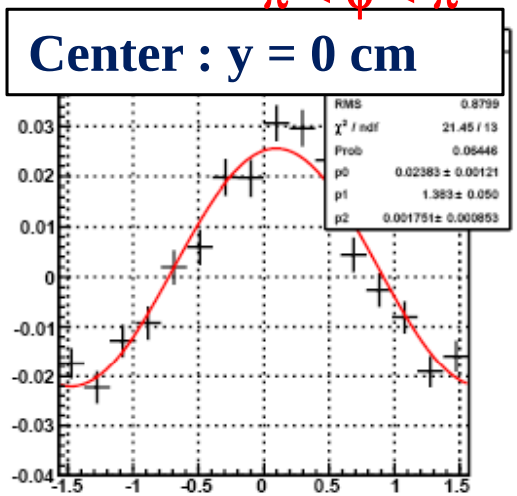


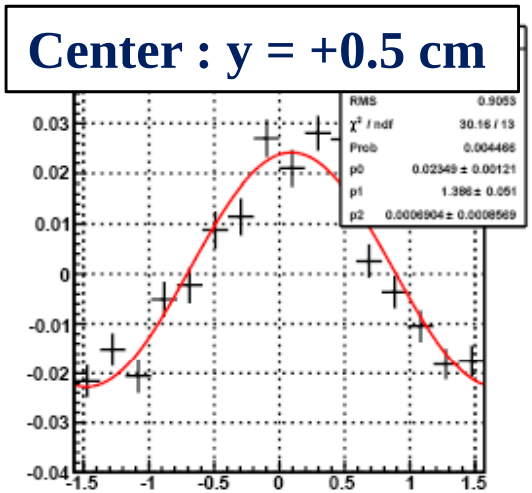
$-\pi < \phi < \pi$

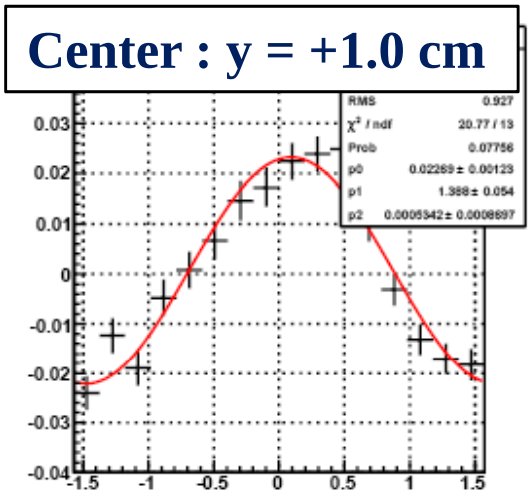
200 GeV data (Fill#10629)

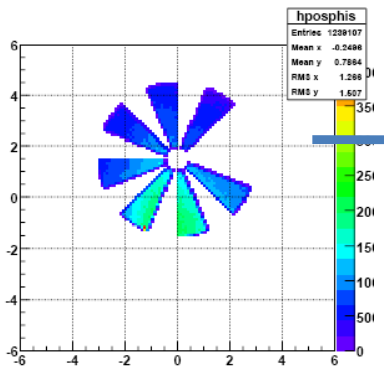
NORTH side

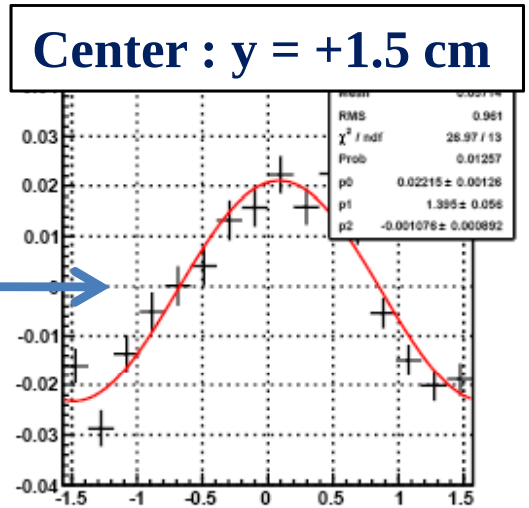
Scan is just in y-direction.

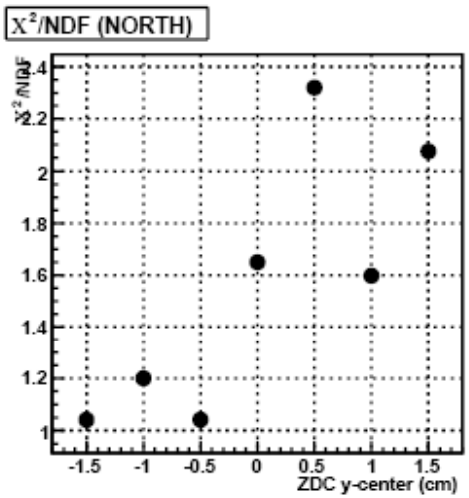


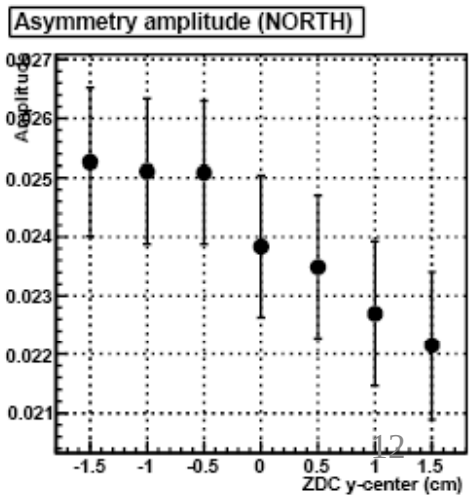








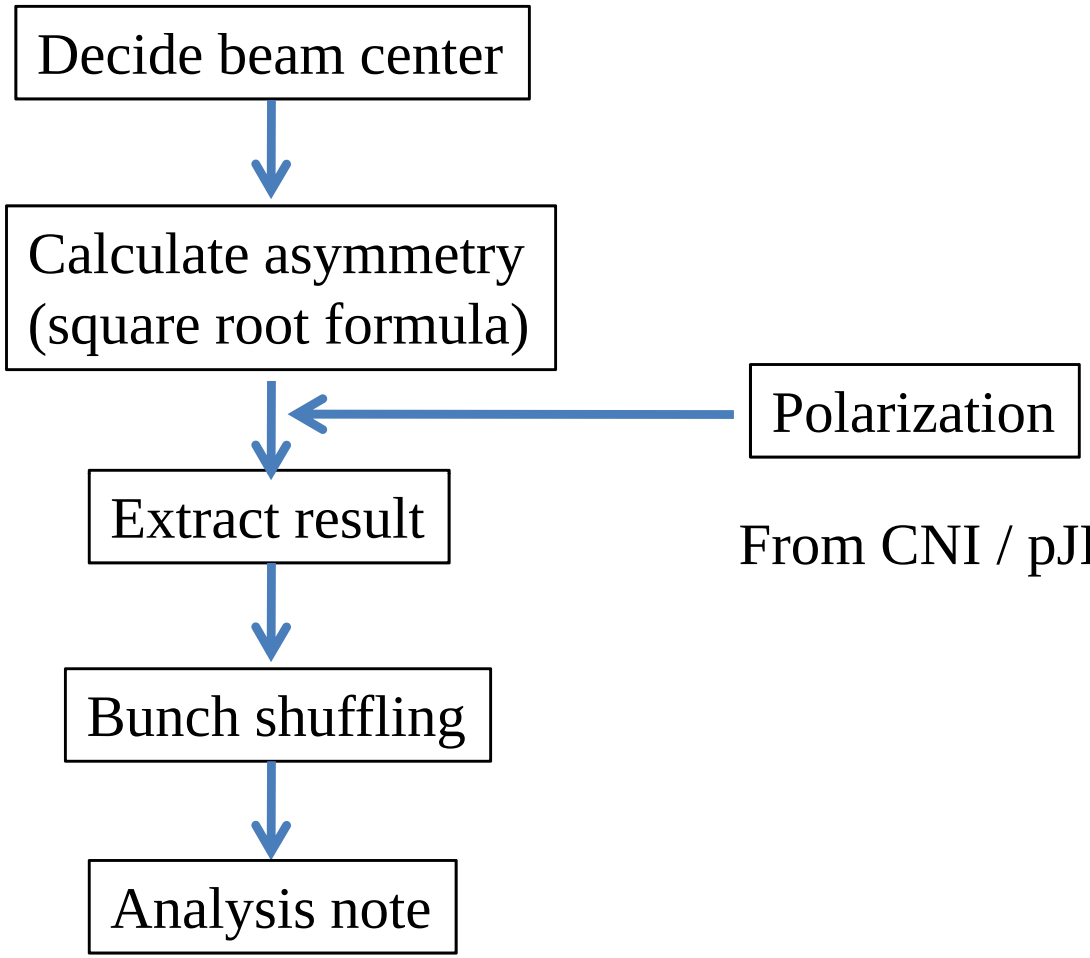




Summary for center scan

- Only did y-scan so far.
  - y = -0.1 cm for 500 GeV. (confirmed by other fills, in backup)
  - Also y=-0.1 cm for 200 GeV?
    - Combine all data.
- Will do x-scan.
  - How much change for amplitude.

For preliminary

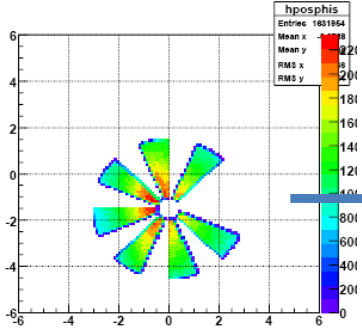


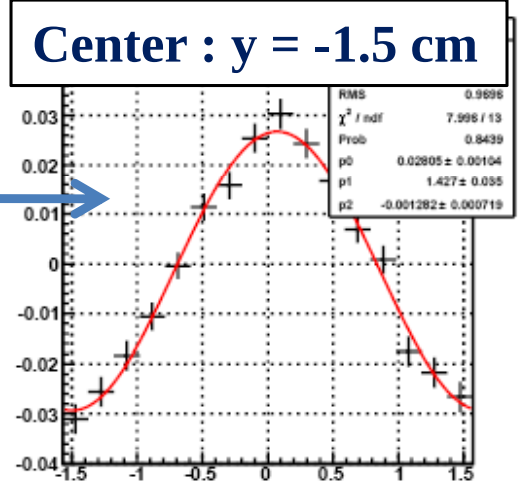
Simulation

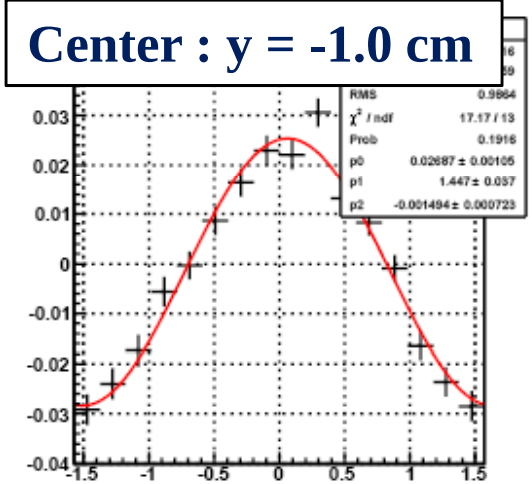
Prepare for 500 GeV.
w/ pythia : BG
w/ single event gen
: smearing effect

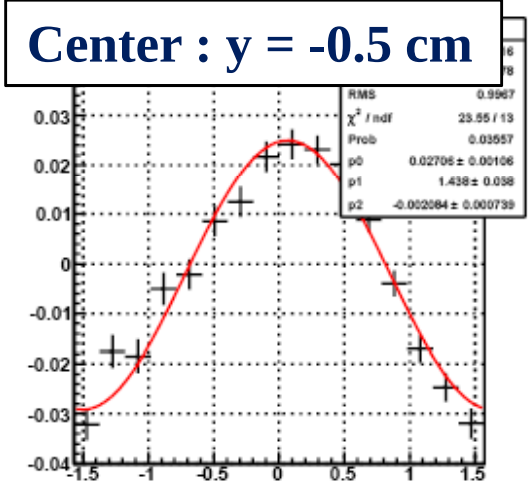
From CNI / pJET

backup



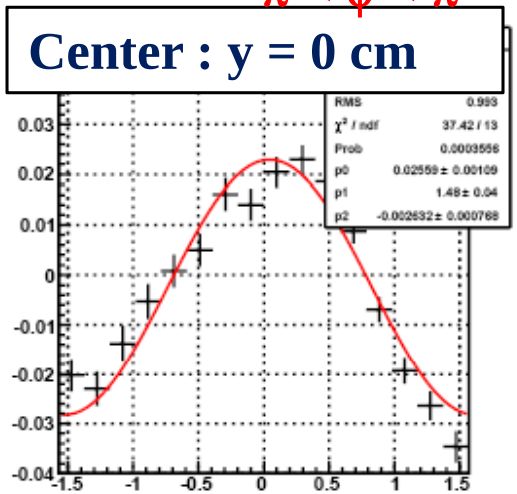


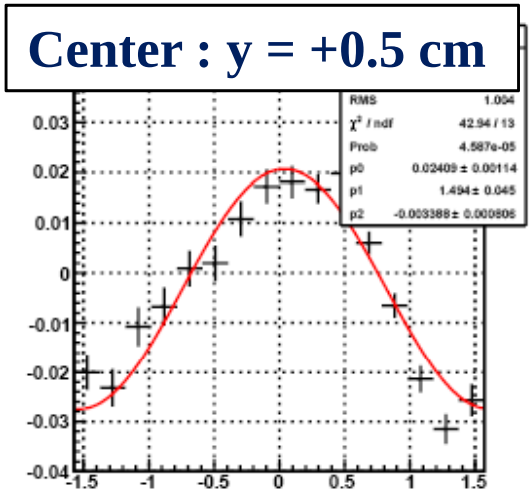


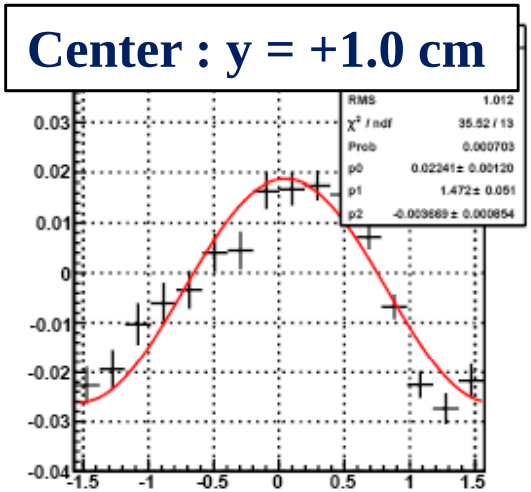


500 GeV data (Fill#10340)

$-\pi < \phi < \pi$

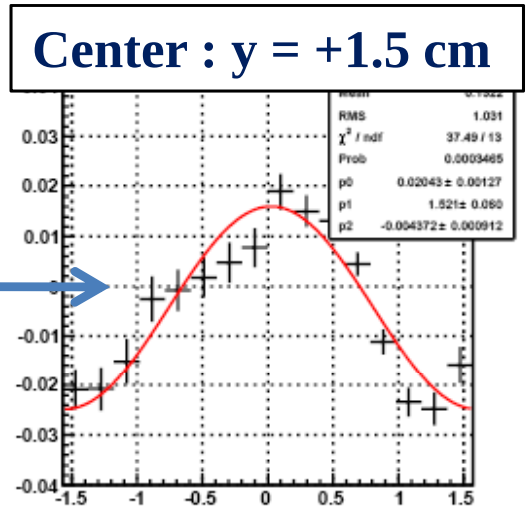


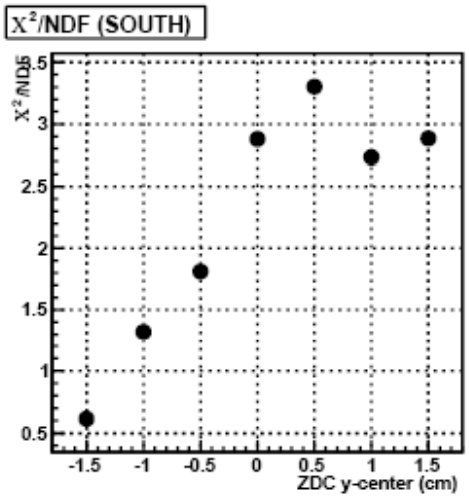


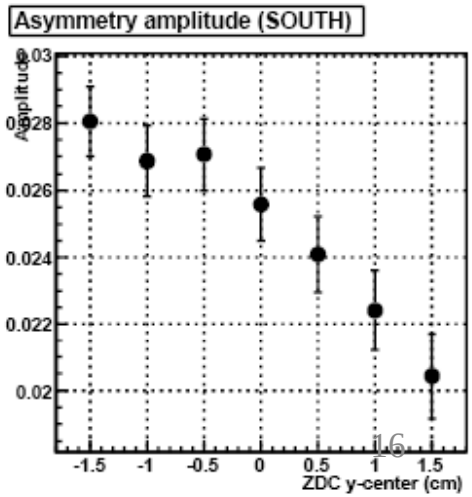


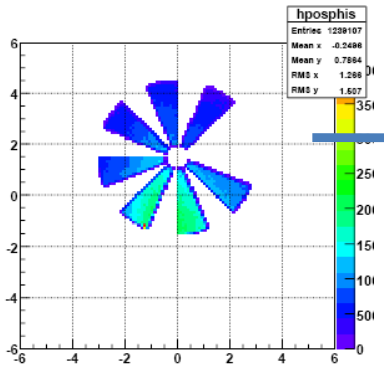
SOUTH side

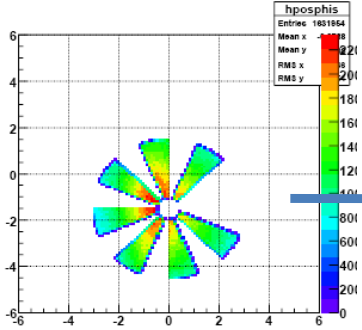
Scan is just in y-direction.

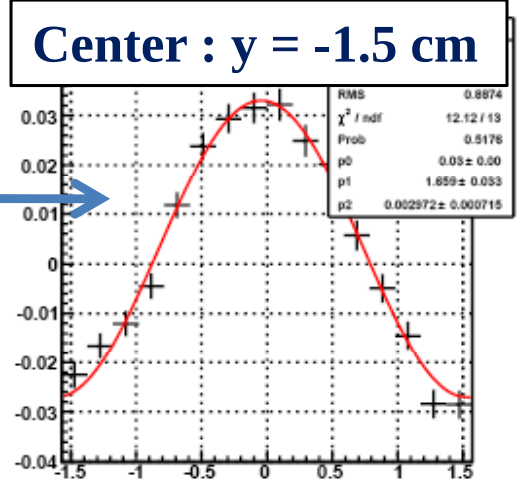


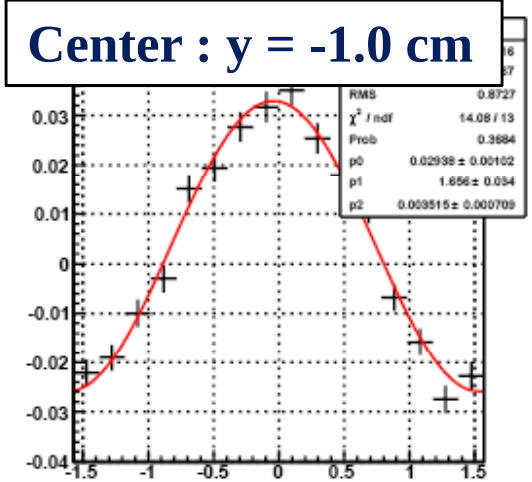


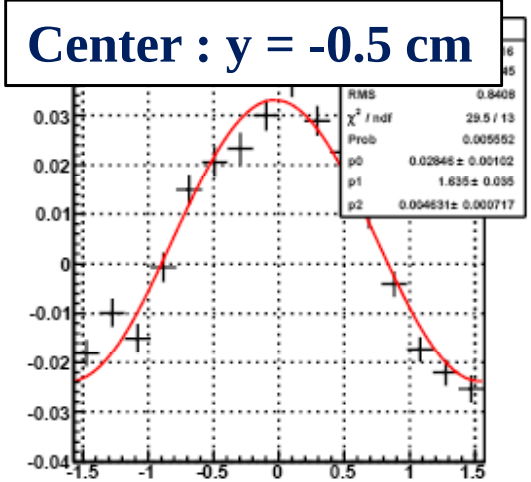












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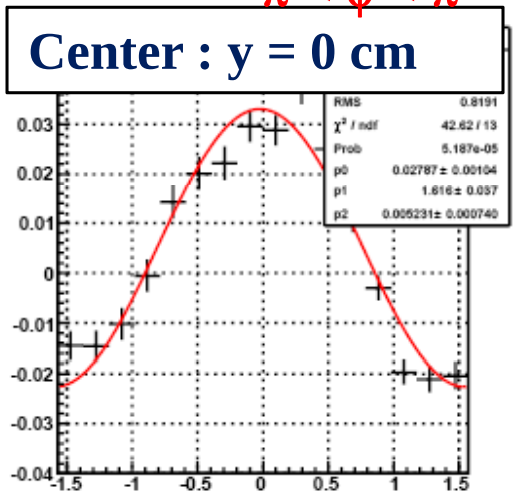
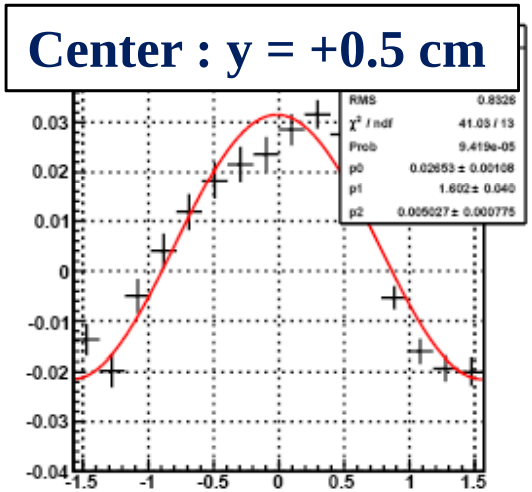
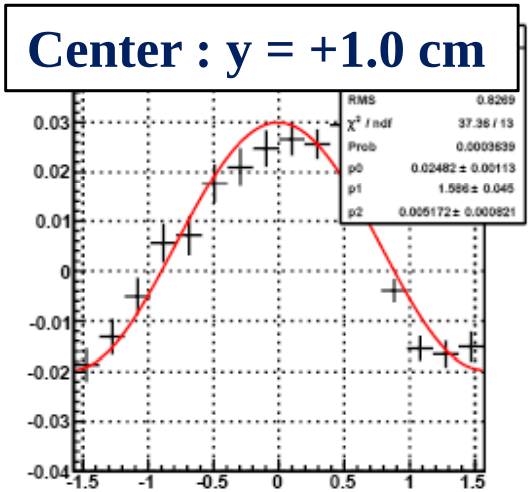
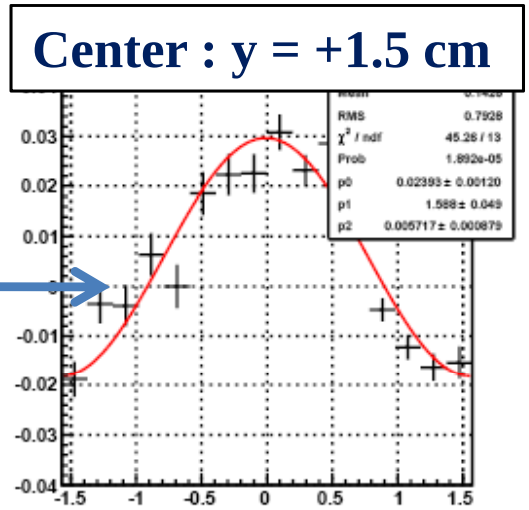


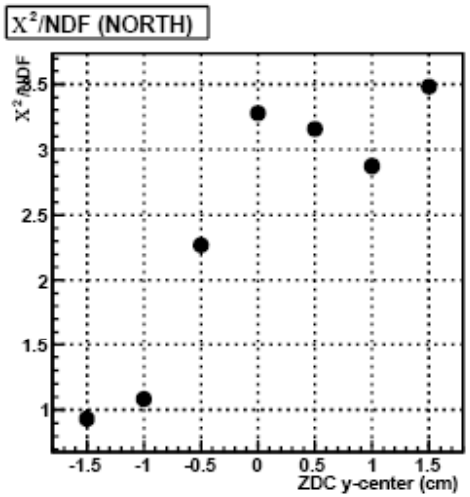


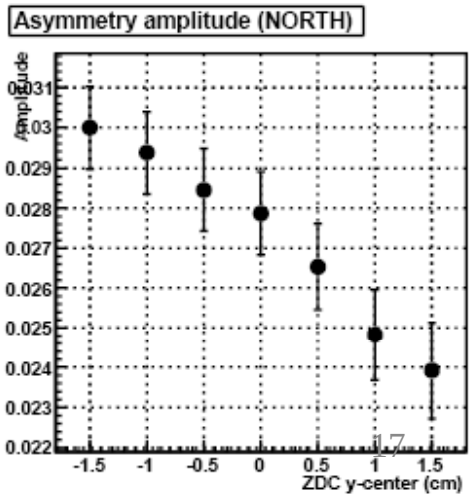


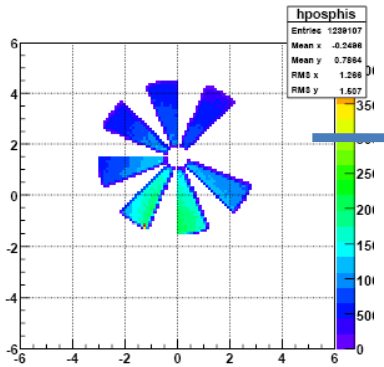
NORTH side

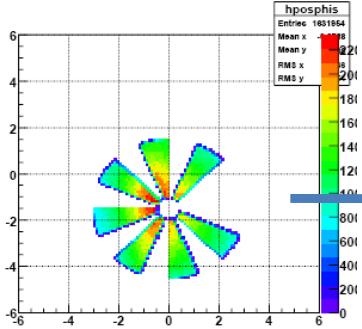
Scan is just in y-direction.

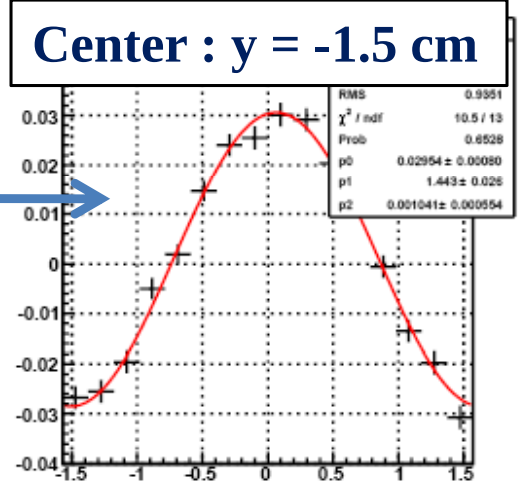


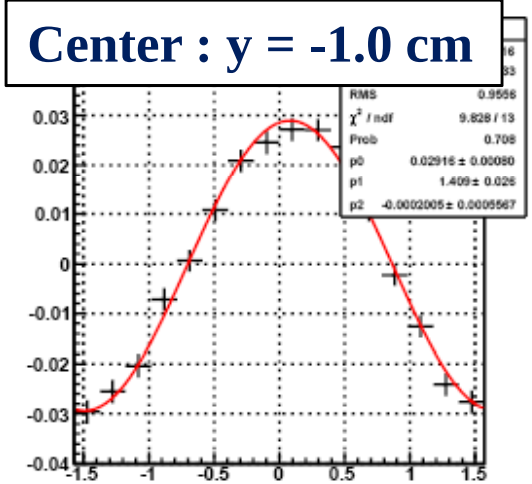


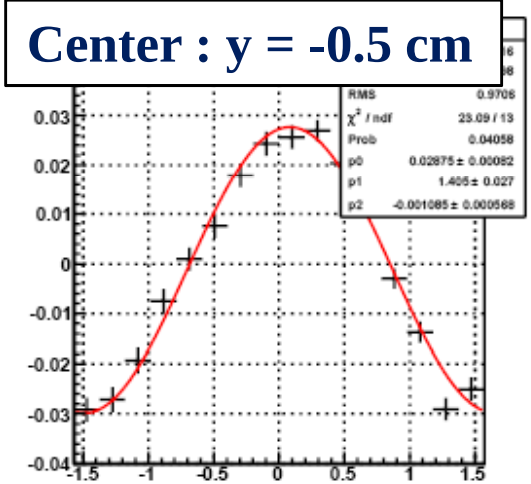












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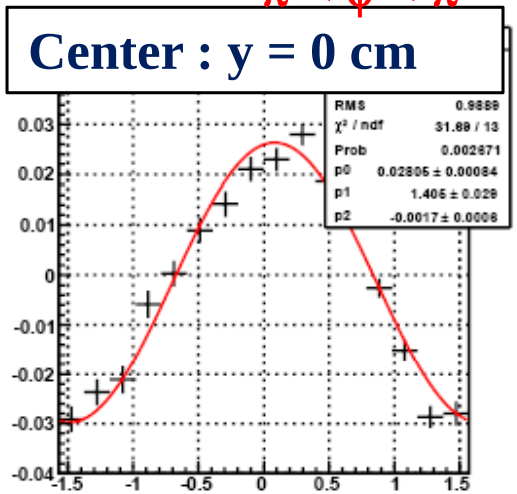
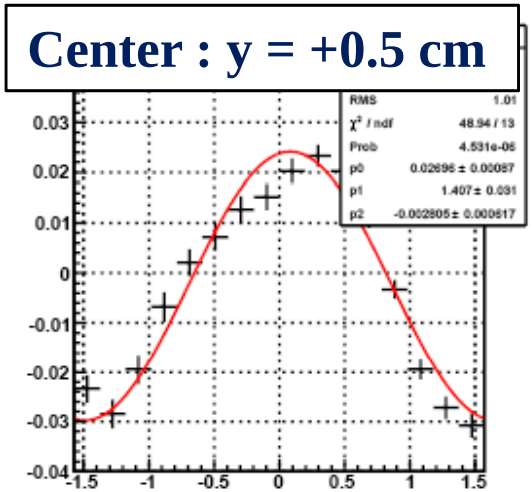
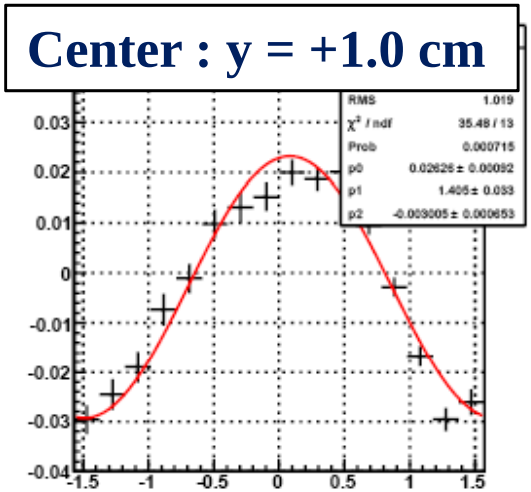
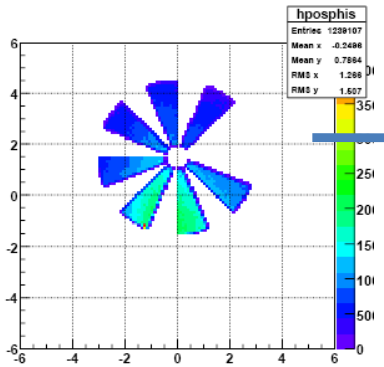


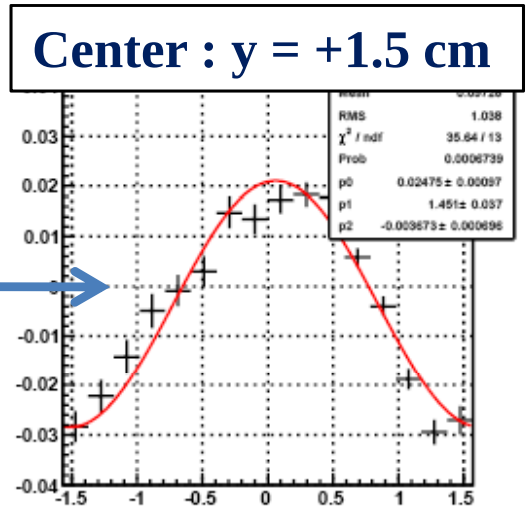


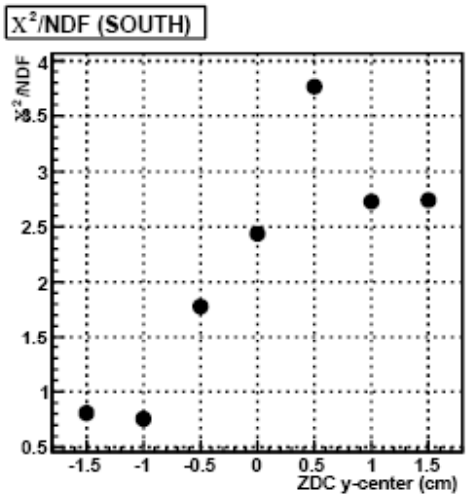


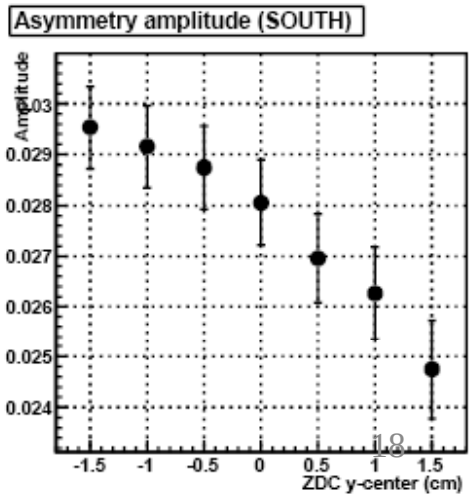
SOUTH side

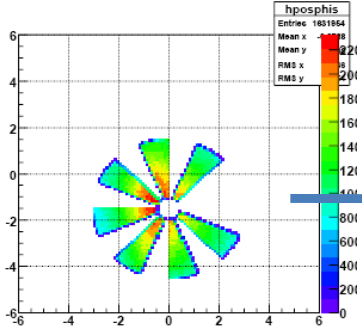
Scan is just in y-direction.

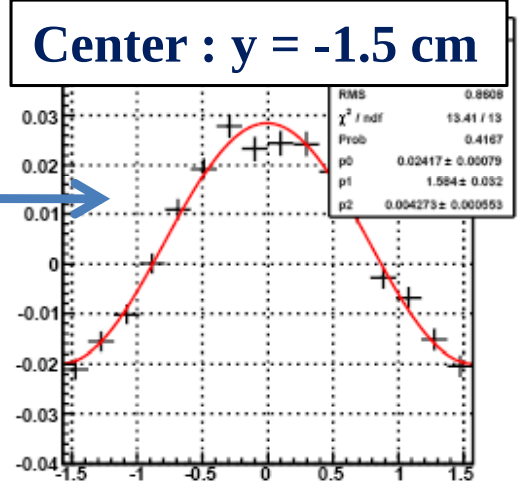


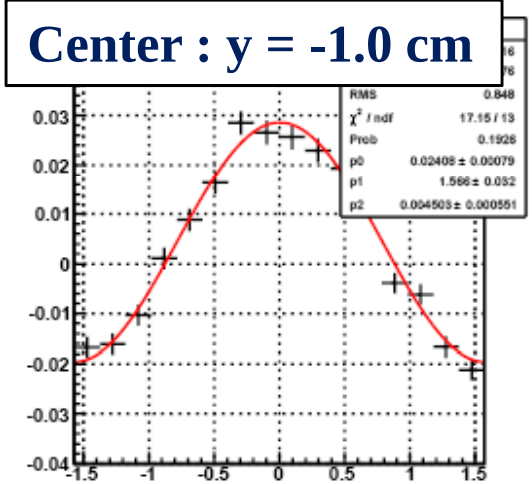


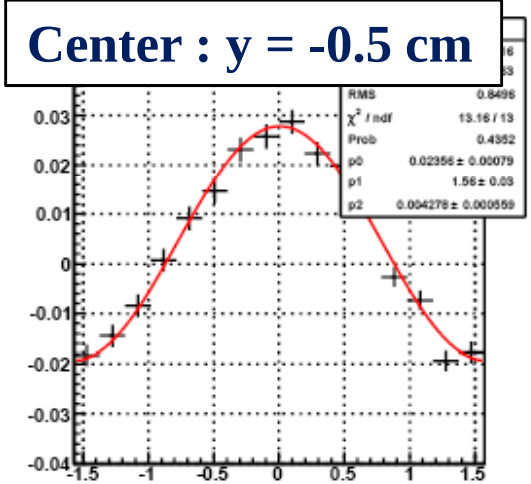












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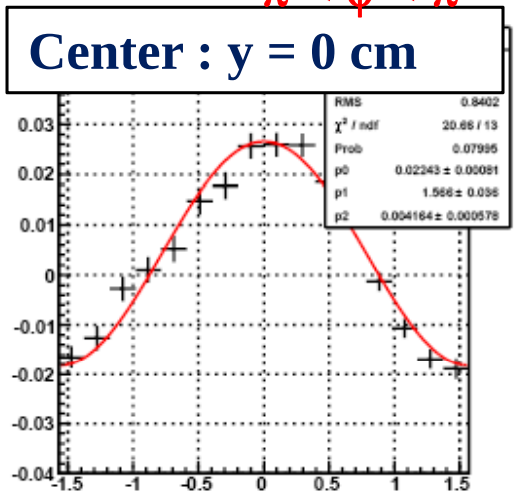
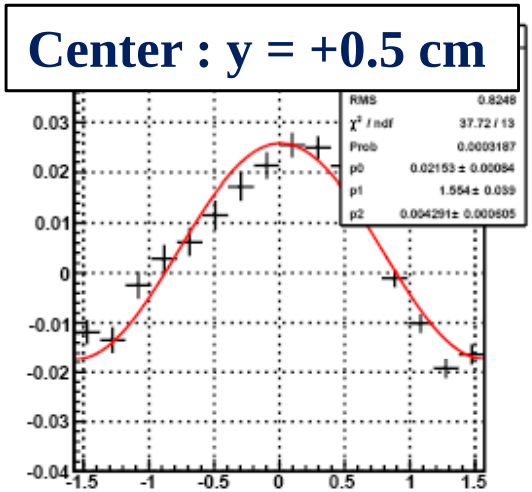
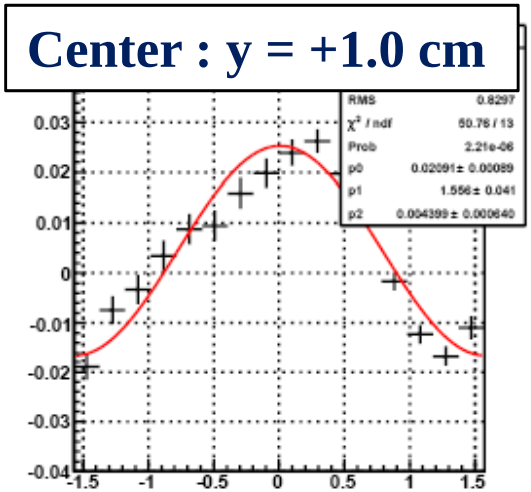
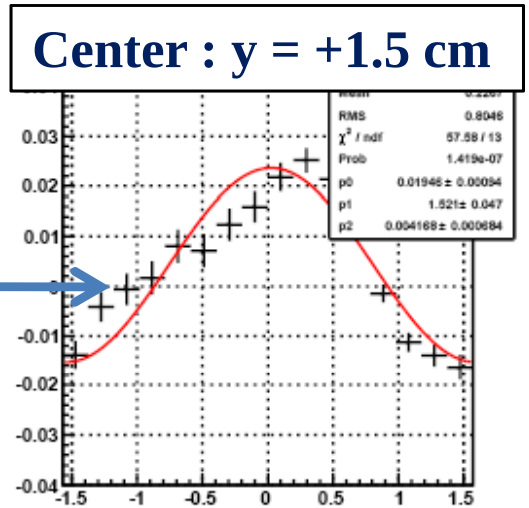


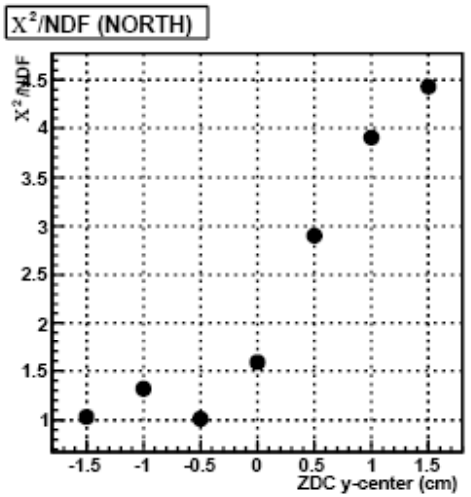


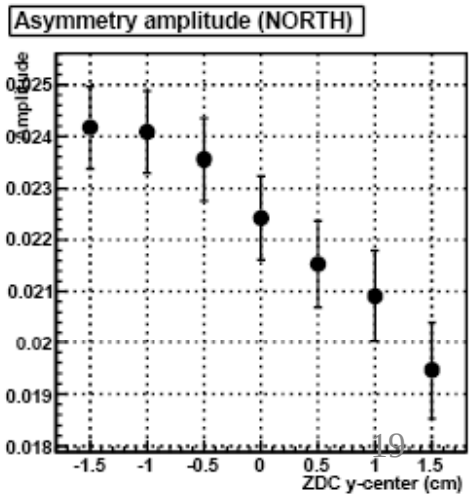


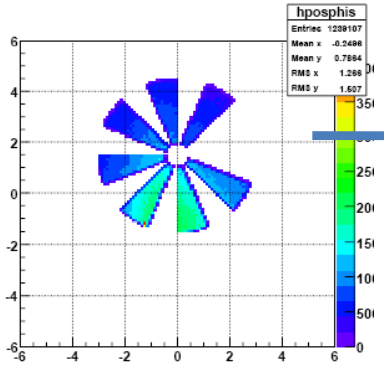
NORTH side

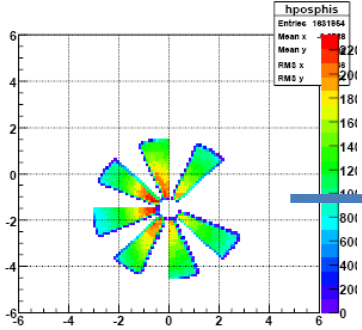
Scan is just in y-direction.

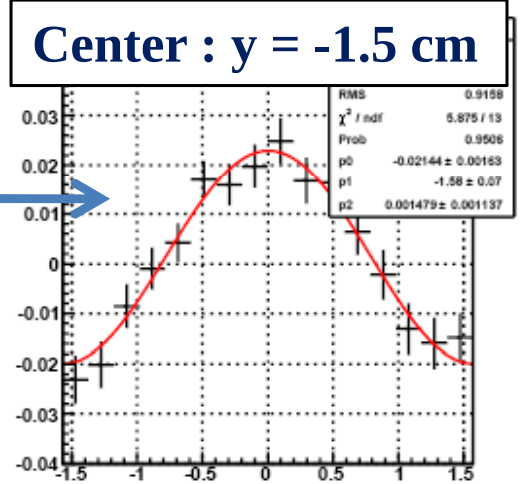


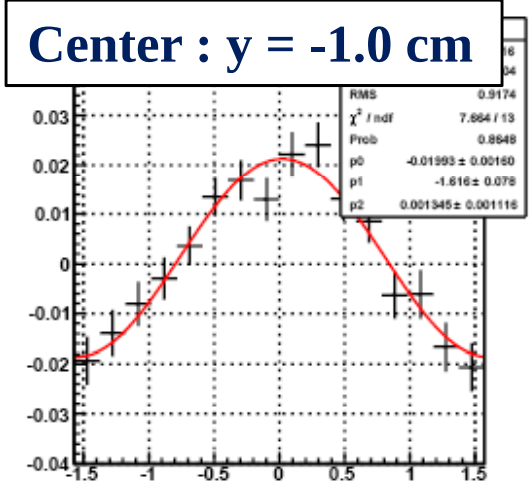


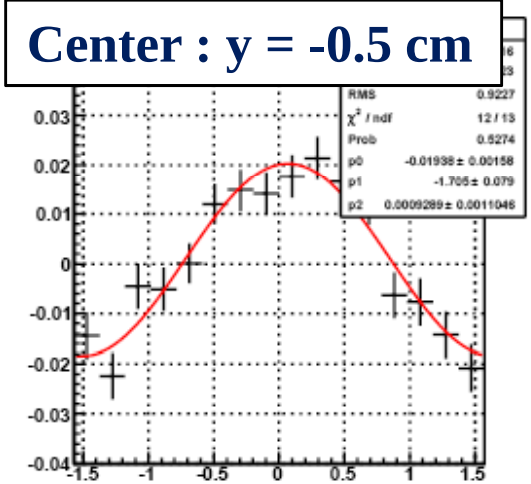












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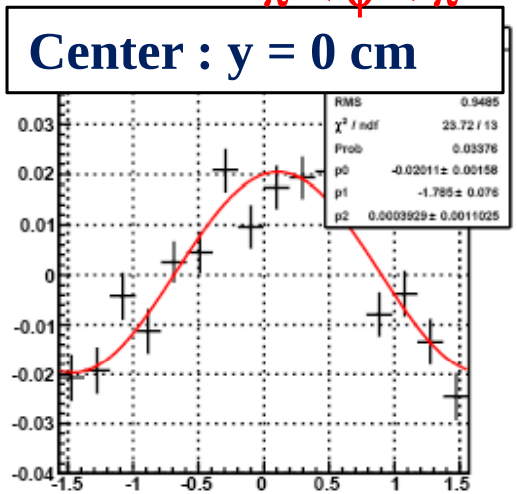
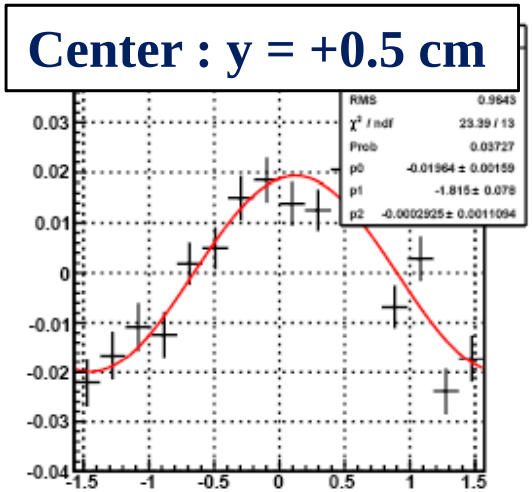
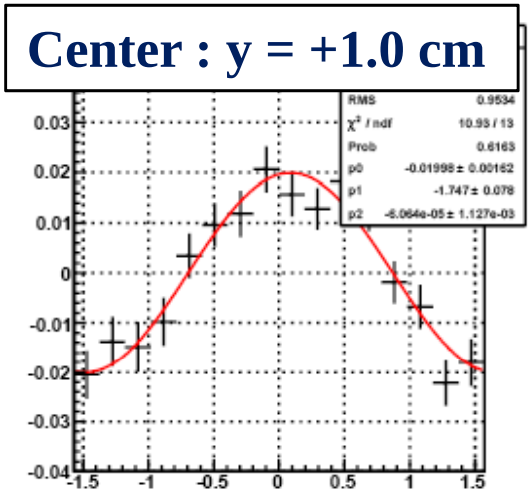
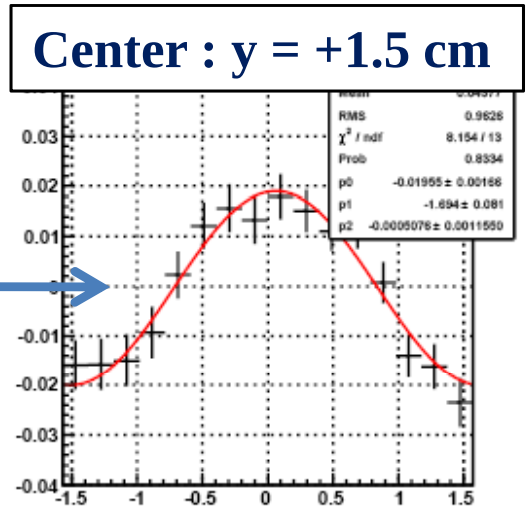


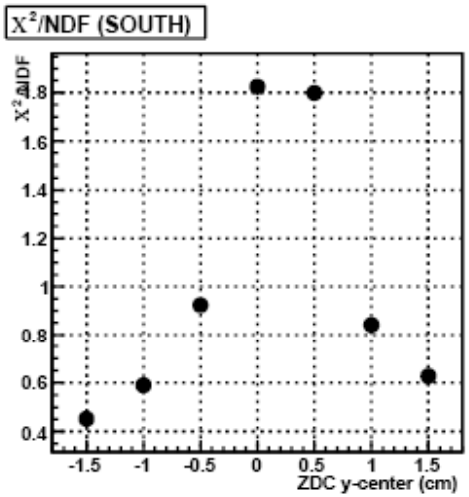


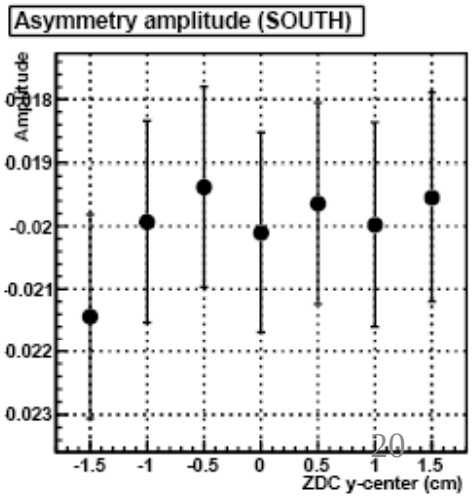


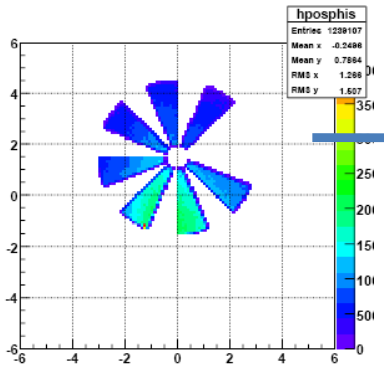
SOUTH side

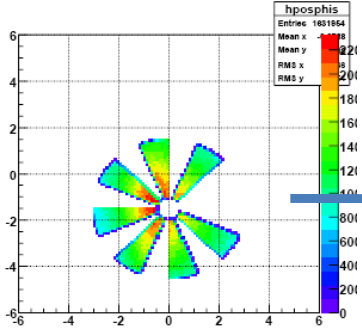
Scan is just in y-direction.

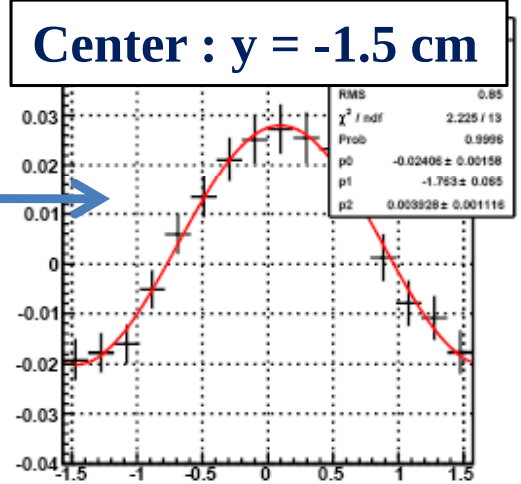


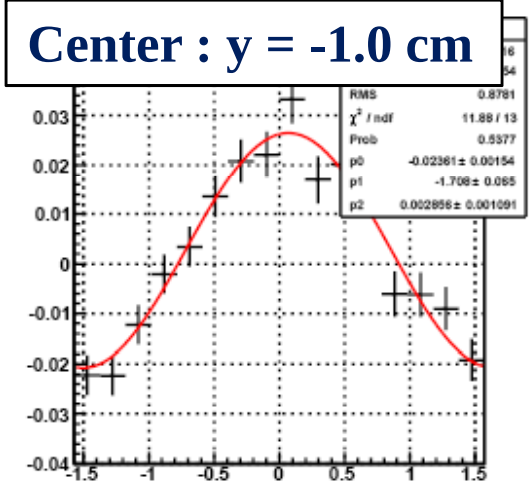


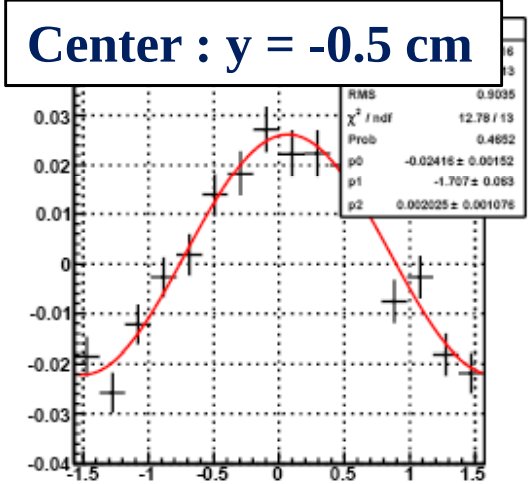












200 GeV data (Fill#10629)

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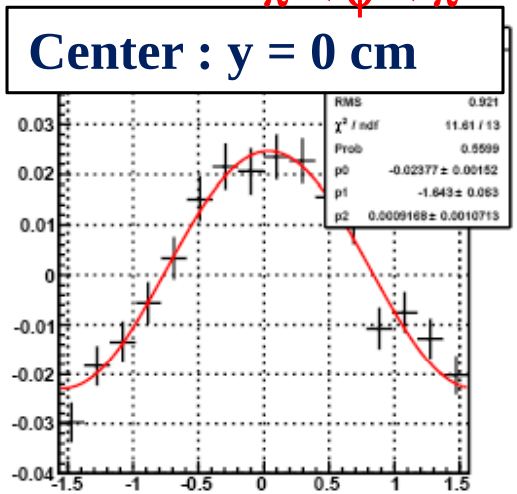
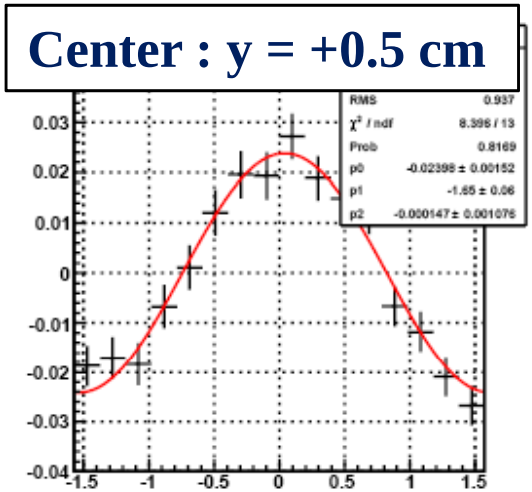
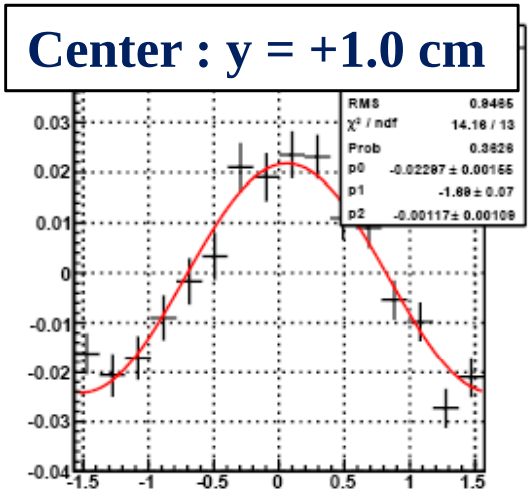
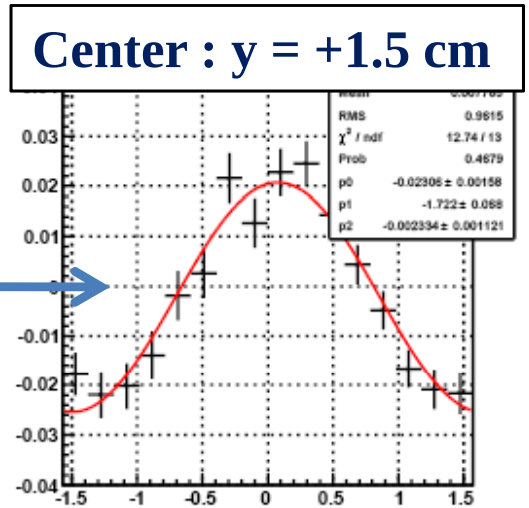
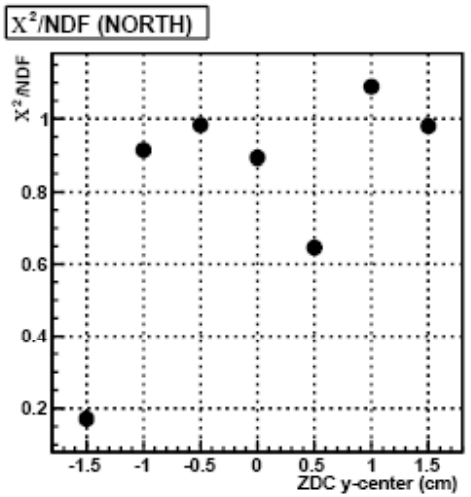
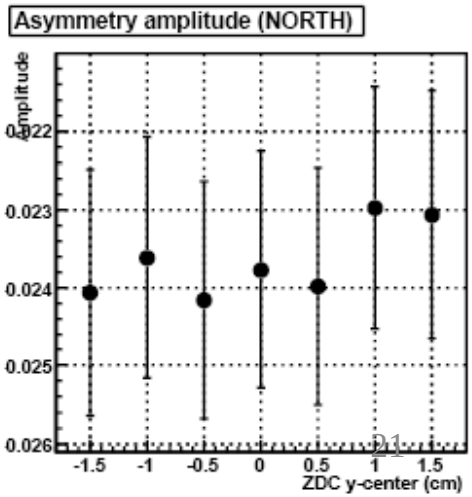
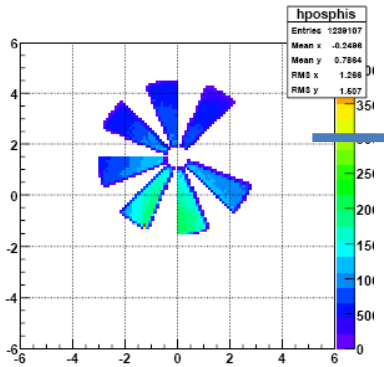






NORTH side

Scan is just in y-direction.