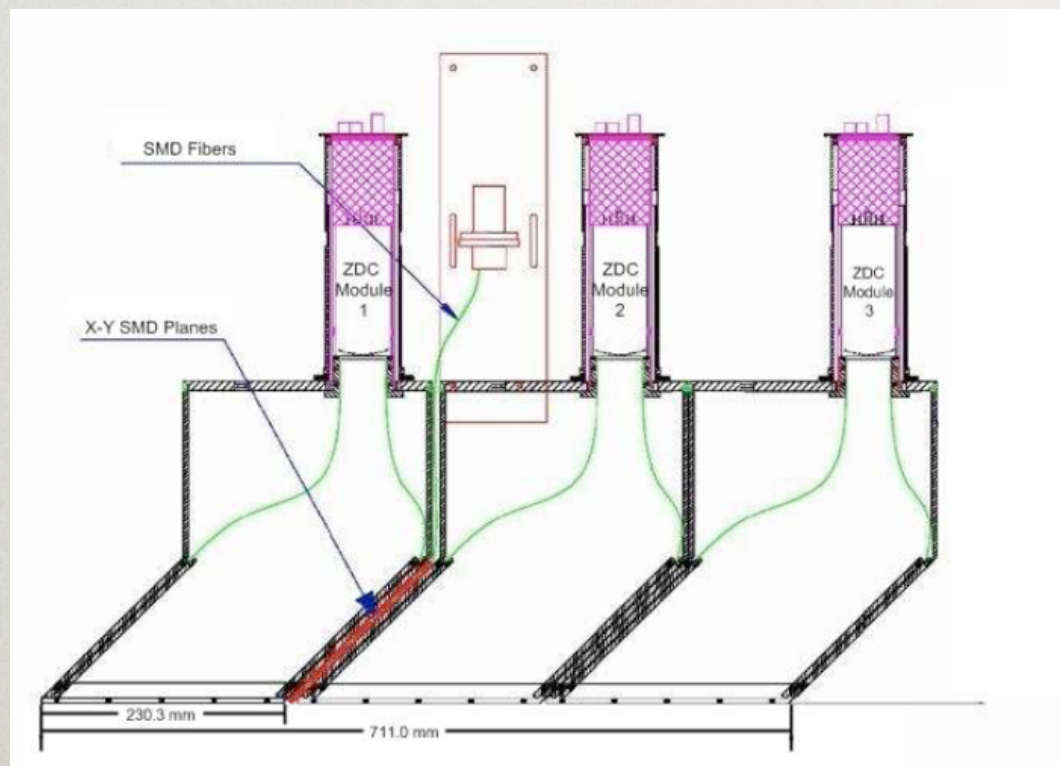
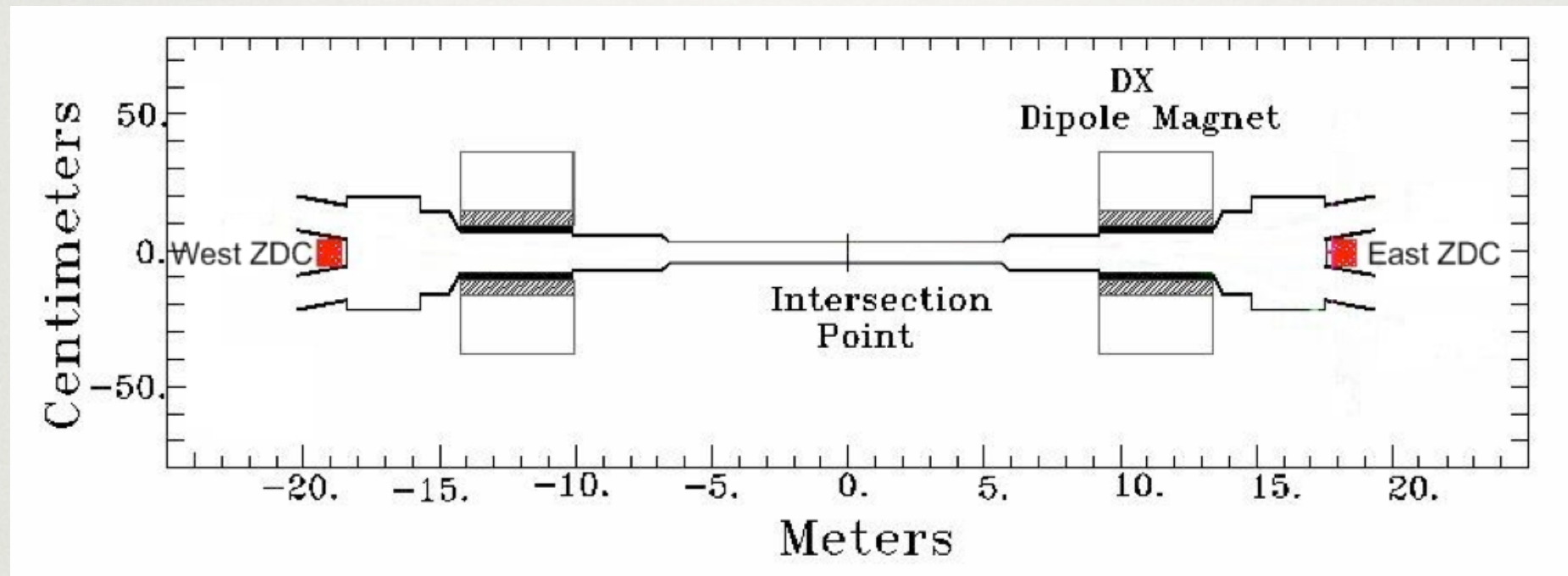


RESIDUAL TRANSVERSE SPIN AT STAR

LEN EUN & ERNST SICHTERMANN
LAWRENCE BERKELEY NATIONAL LAB
2013/03/08

STAR ZDC Local Polarimetry

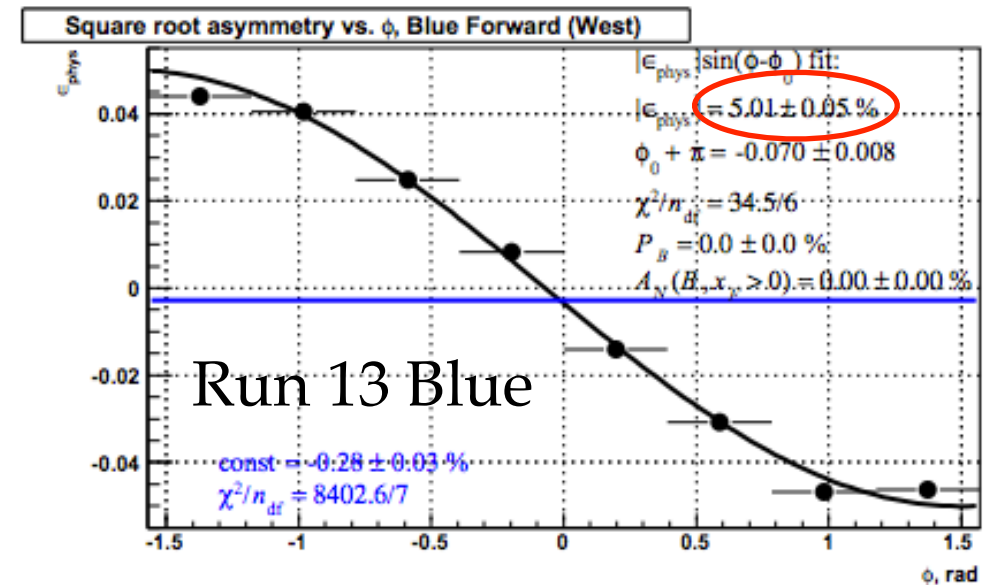
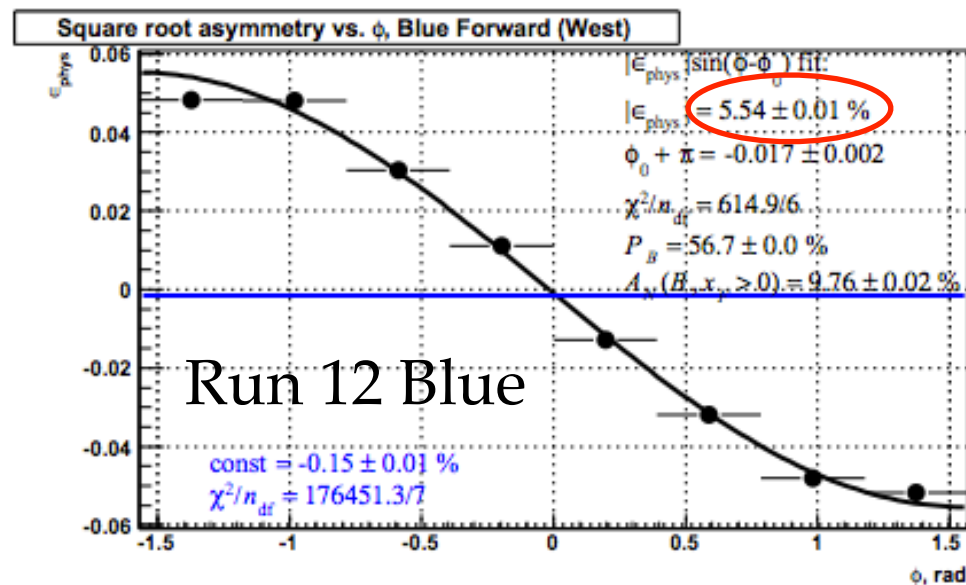
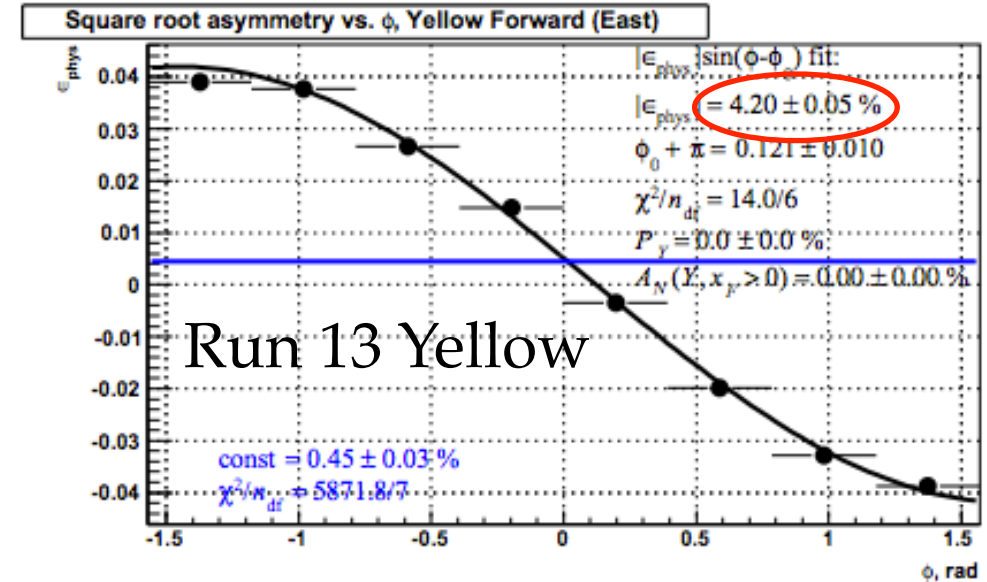
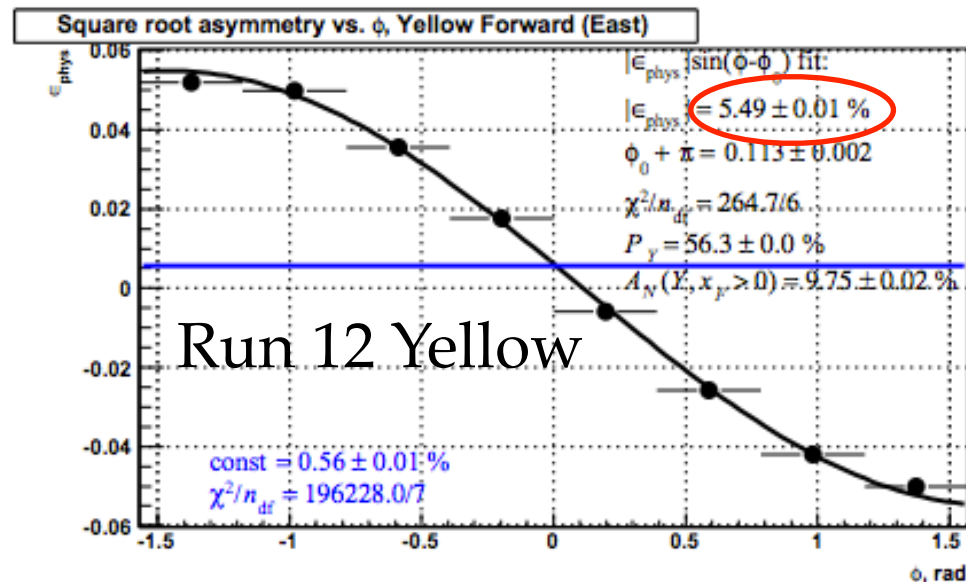


ZDC is a Cherenkov-light sampling calorimeter that detects forward neutral particles (<2 mrad)

Upgraded with Shower Maximum Detector (SMD) to provide transverse position of hadronic showers.

ZDC RAW ASYMMETRIES

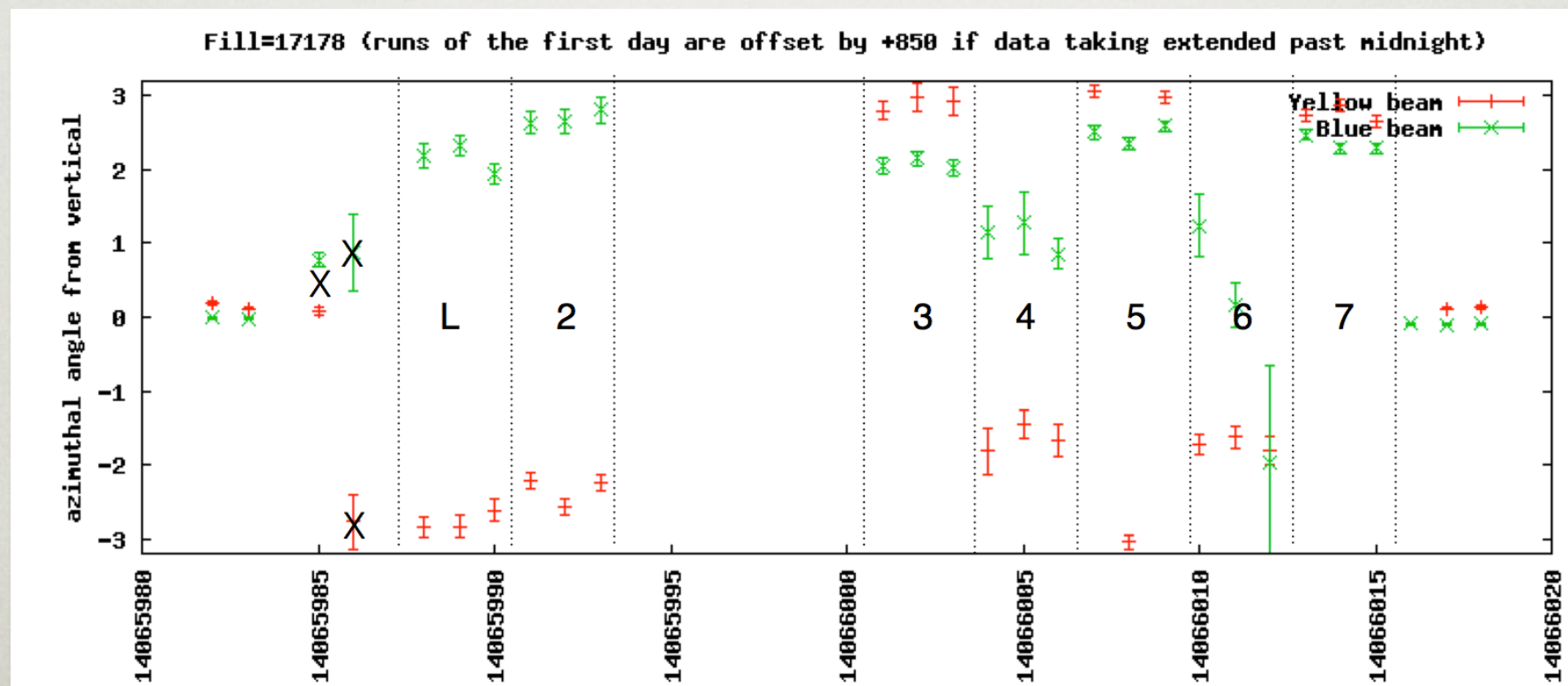
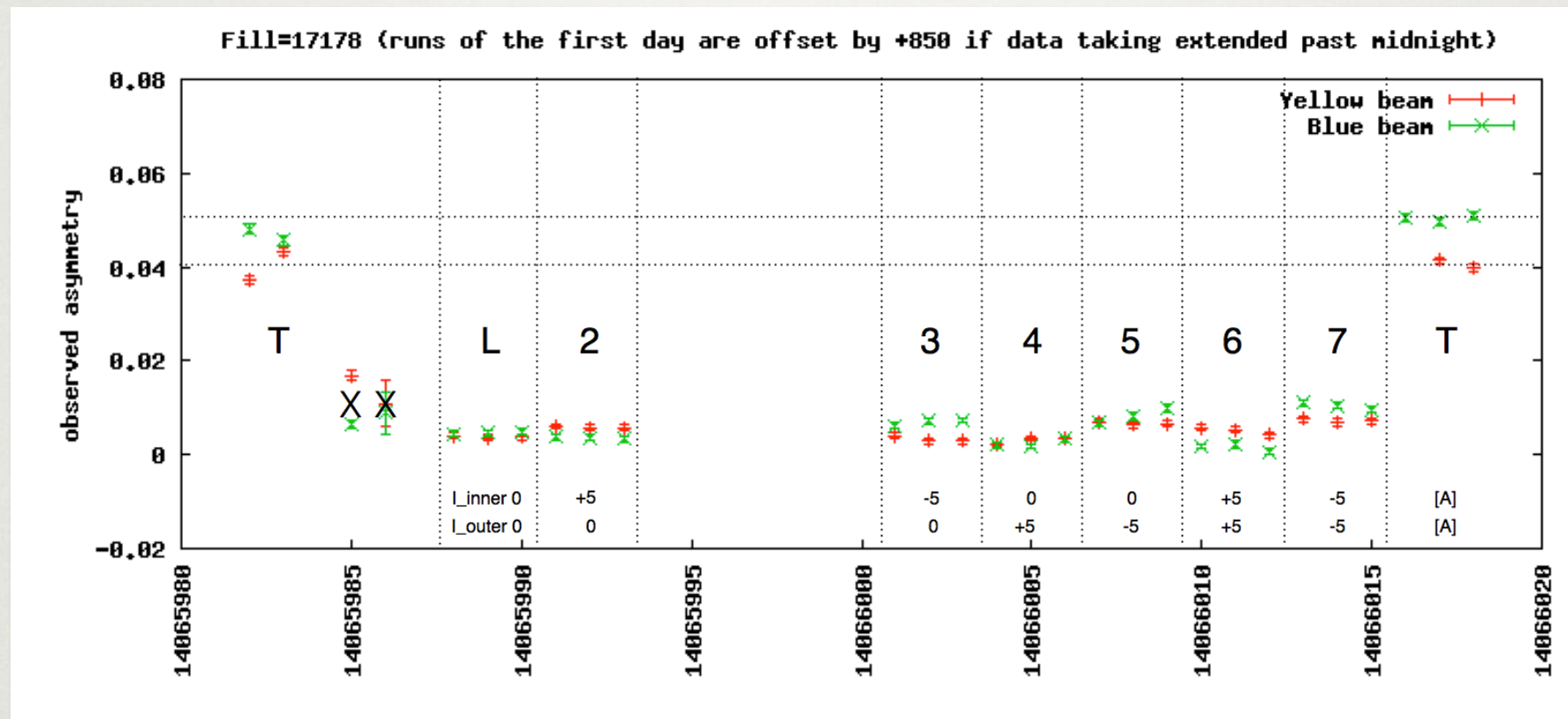
The raw asymmetry (ϵ) observed during the transverse stores was 4~5%, reasonably consistent with run 2012 given the uncertainty in polarization this year.



ZDC Single Spin Asymmetry (fill 16567)

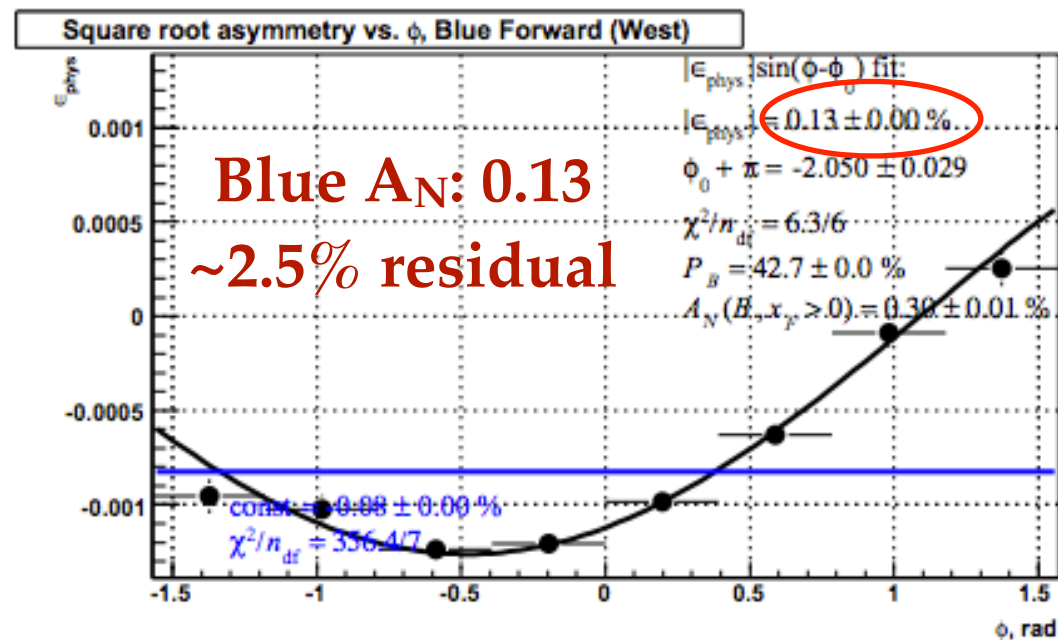
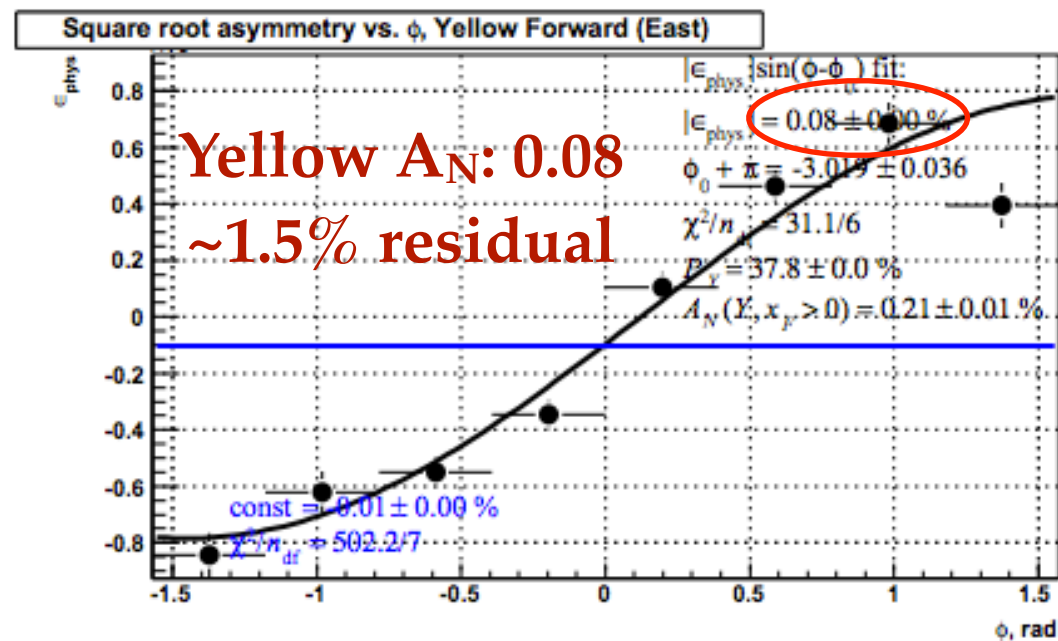
ZDC Single Spin Asymmetry (run 14064022)

ROTATOR CURRENT SCAN 3/7/13



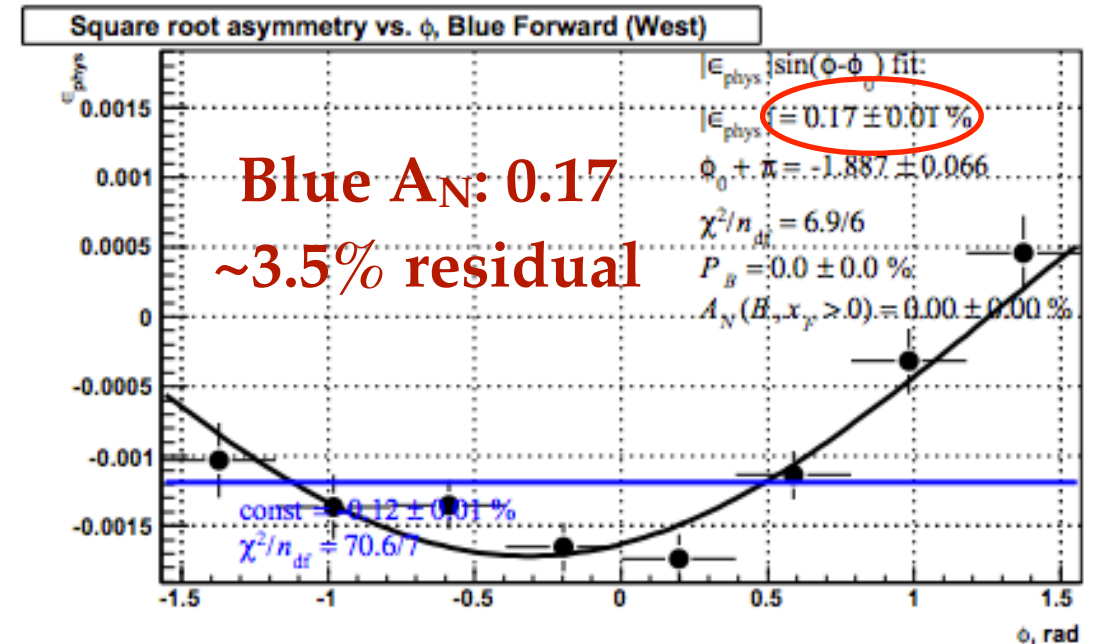
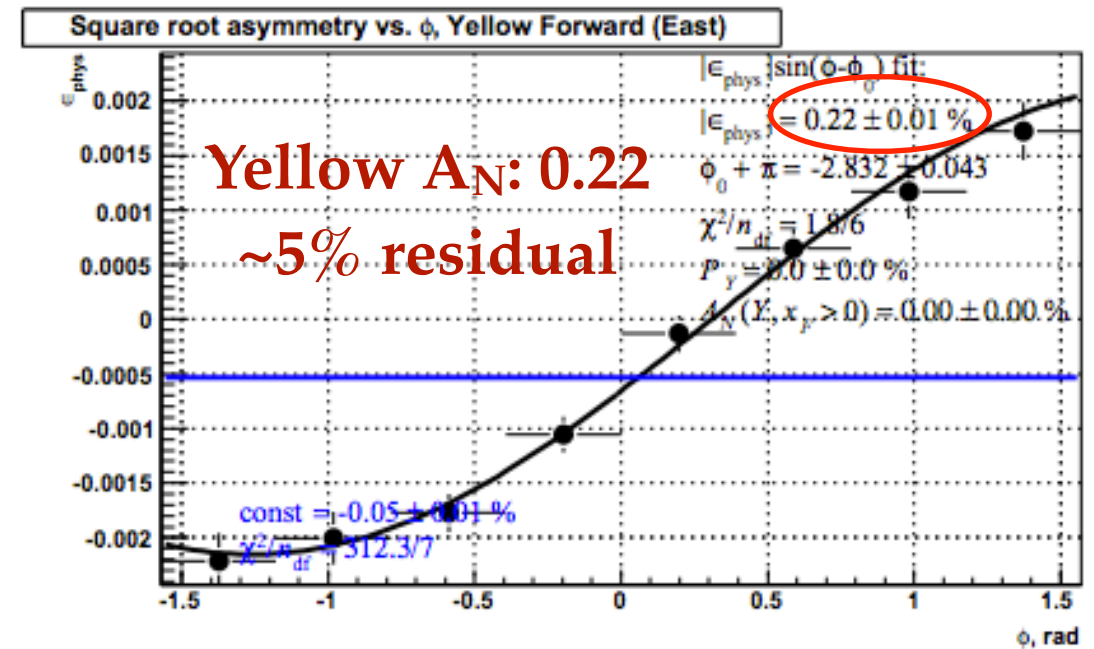
RESIDUAL TRANSVERSE SPIN

Run 12, after the rotator tune



ZDC Single Spin Asymmetry (fill 16592)

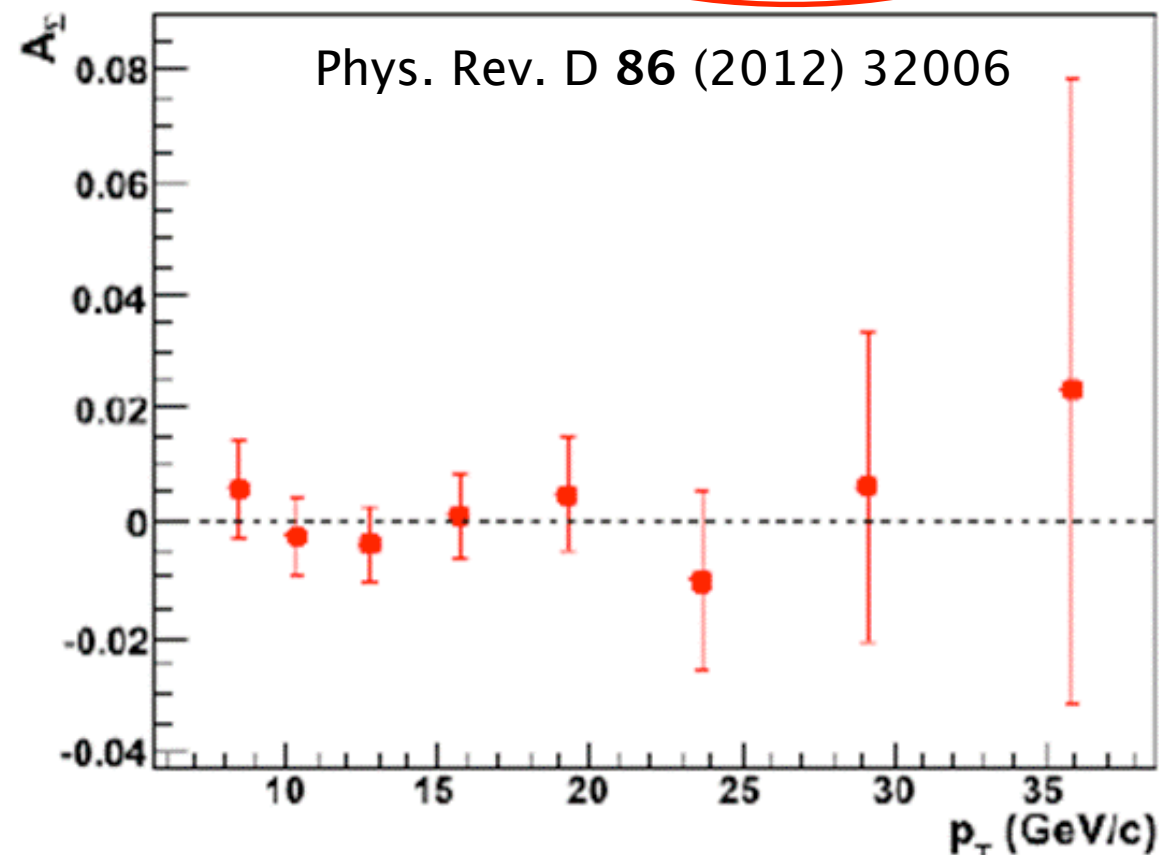
Run 13, after the rotator tune



ZDC Single Spin Asymmetry (fill 17186)

CONTRIBUTIONS TO A_{LL} SYSTEMATICS

$$\delta A_{LL}^{relative\ luminosity} \sim 10^{-4}$$
$$\delta A_{LL}^{residual\ transverse} = \left| \tan(\theta_Y) \tan(\theta_B) \cos(\phi_Y - \phi_B) A_\Sigma \right| \sim \left| \theta_Y \theta_B A_\Sigma \right|$$
$$A_\Sigma \sim 10^{-2} \rightarrow \theta_Y \theta_B < 10^{-2}$$



We are at $\theta_Y \theta_B \sim 2 \times 10^{-3}$. So for most p_T bins, the current level of residual transverse spin should be acceptable.
However, given what we saw last year (4×10^{-4}), we could do better.

THE END

ANGLE CONVENTION

SAME AS LAST YEAR

