E08-011 Measurement of Deuteron PVDIS Asymmetry at 6 GeV

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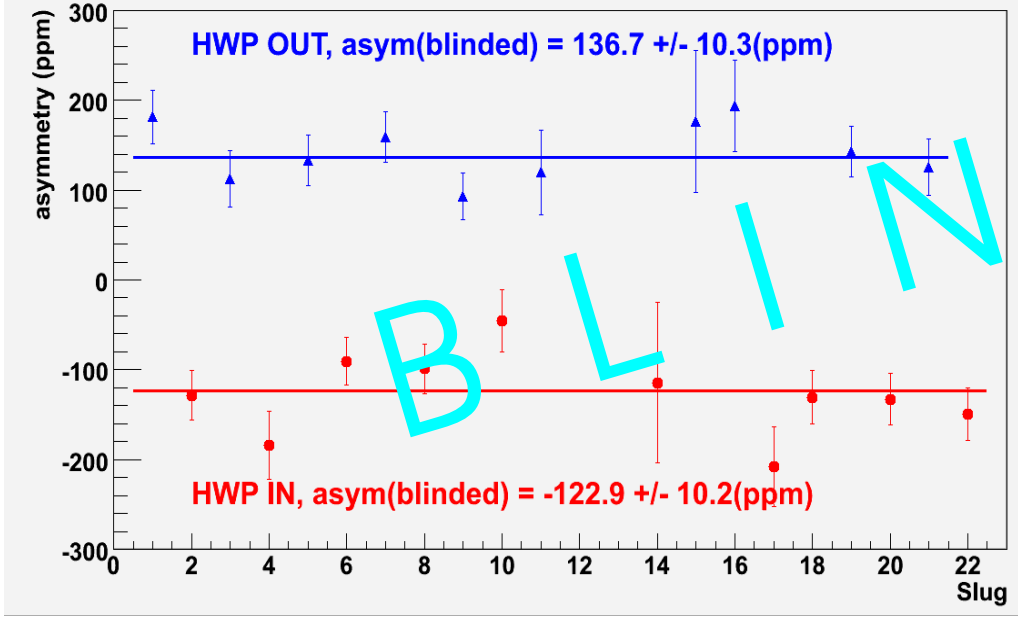
- Deuterium:

$$A_d = (540\ ppm)Q^2 \frac{2C_{1u}[1+R_C(x)] - C_{1d}[1+R_S(x)] + Y(2C_{2u} - C_{2d})R_V(x)}{5 + R_S(x) + 4R_C(x)}$$

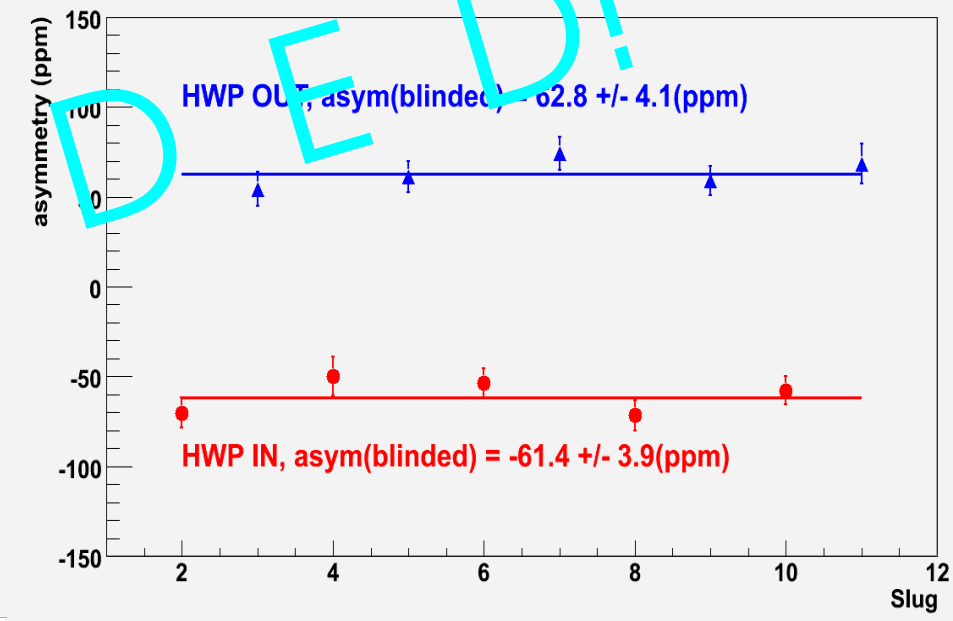
- PVDIS provides an opportunity to study both electroweak Standard Model via the extraction of $C_{1,2q}$ (and $\sin^2\theta_W$), and hadronic effects.
- The 6 GeV experiment is an exploratory step of this program.
- Ran from Oct. 29 to Dec. 22, 2009, incl. 5 days switchover, 4 days commissioning)

DIS Production Asymmetries

Online Asymmetries, Q^2=1.9 (80% of statistics)

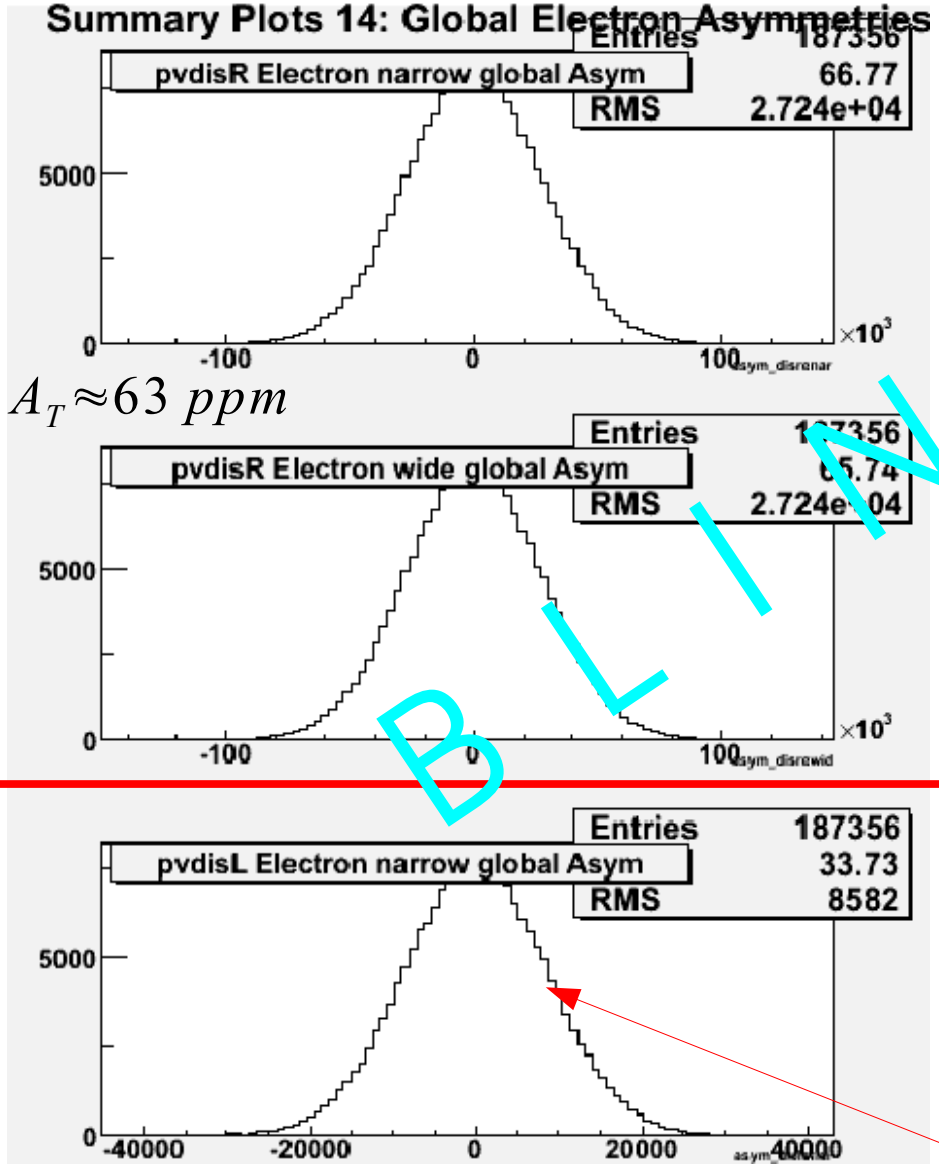


Online Asymmetries, Q^2=1.1 (all statistics)



Transverse (vertical) Beam Asymmetries (Dec. 2)

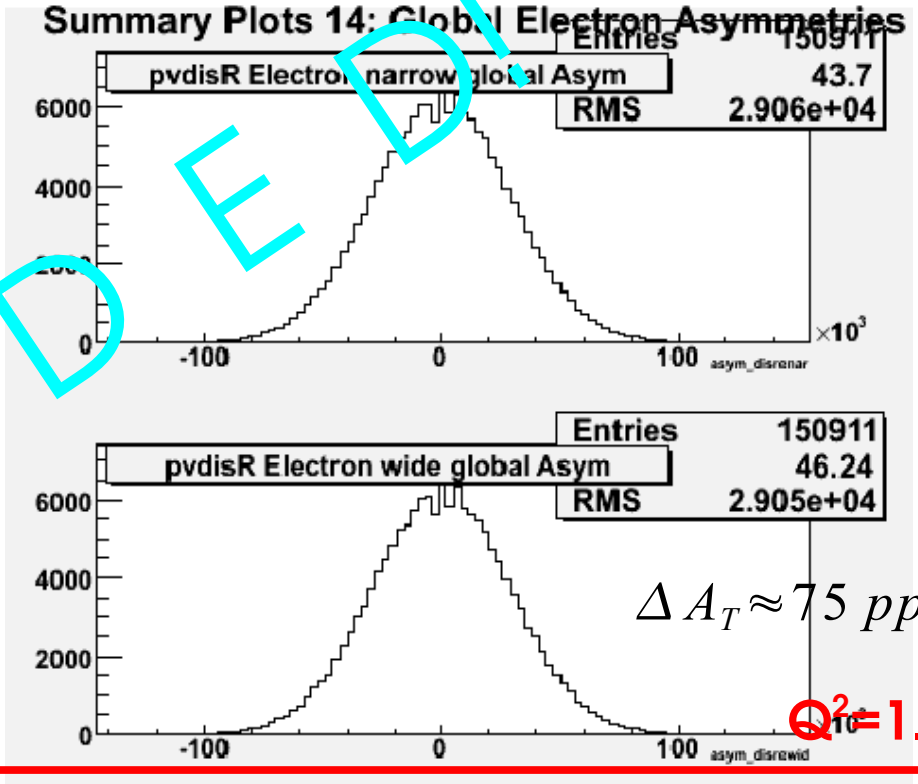
Beam HWP OUT



$\Delta A_T \approx 63\ ppm$

$\Delta A_T = \frac{8582}{\sqrt{187356}} \approx 20\ ppm$

Beam HWP IN



$\Delta A_T \approx 75\ ppm$

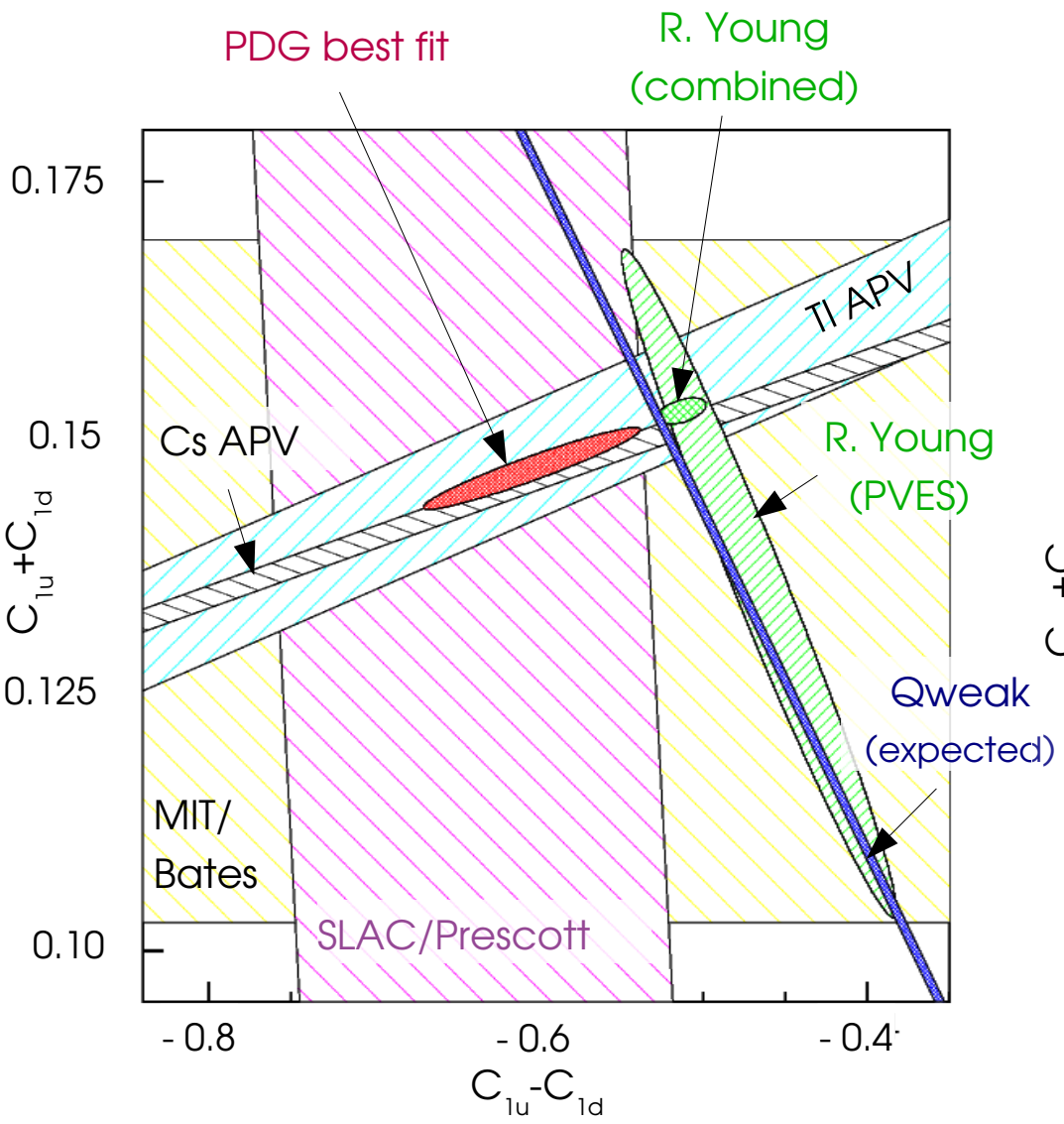
$Q^2 = 1.9$

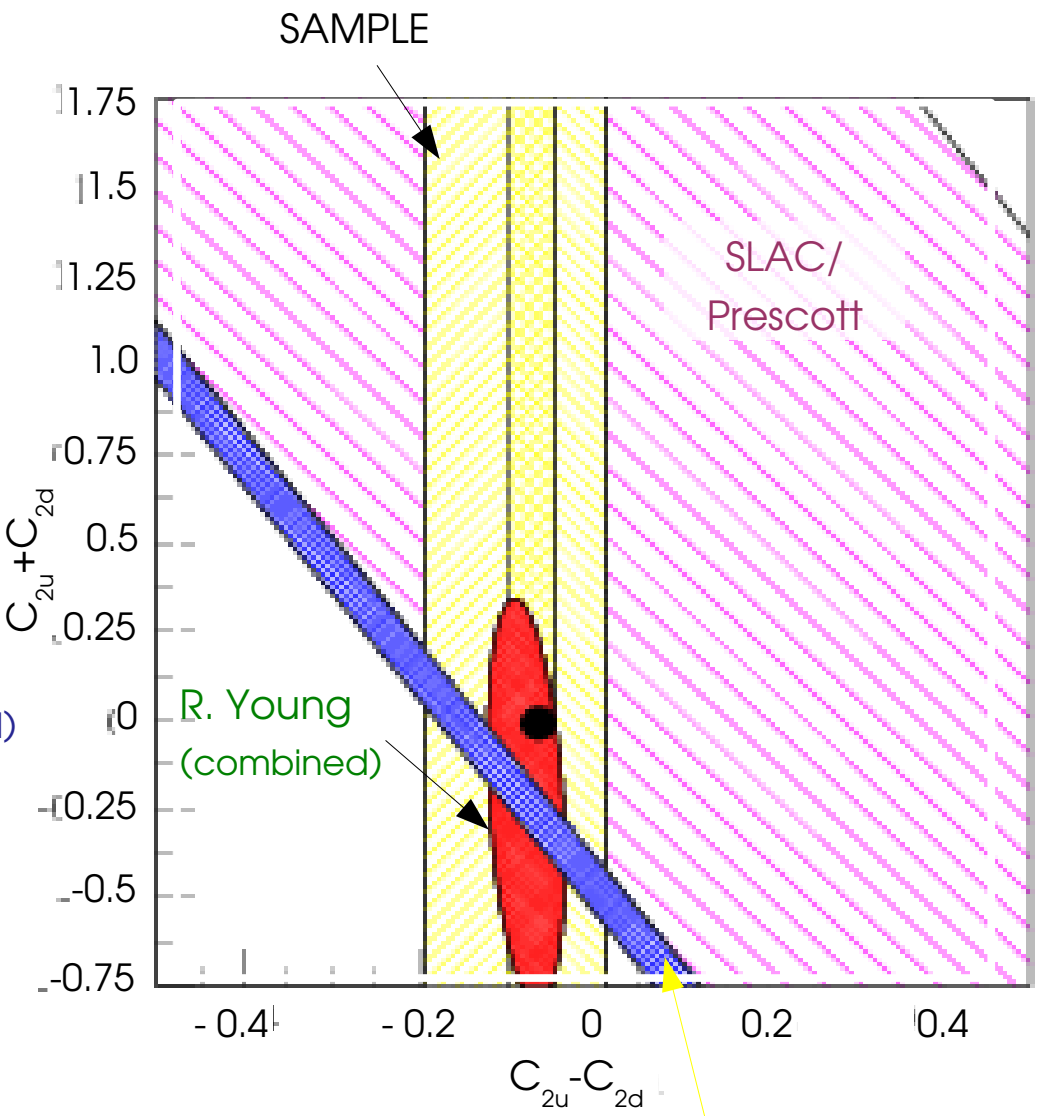
$Q^2 = 1.1$

BLINDED!

The 6 GeV E08-011

all are 1 σ limit





Expected: JLab 6 GeV PV-DIS E08-011 (assuming small hadronic effects **and a 3% statistical error. Current expetation is 4%!**)