Wave-Plate Asymmetries: Pions

Matthew Posik

[1] Temple University
Philadelphia, PA 19122

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Outline

Note

This analysis is meant to compliment the talk posted on 12/20/2012 to the d2n wiki

Current Asymmetries

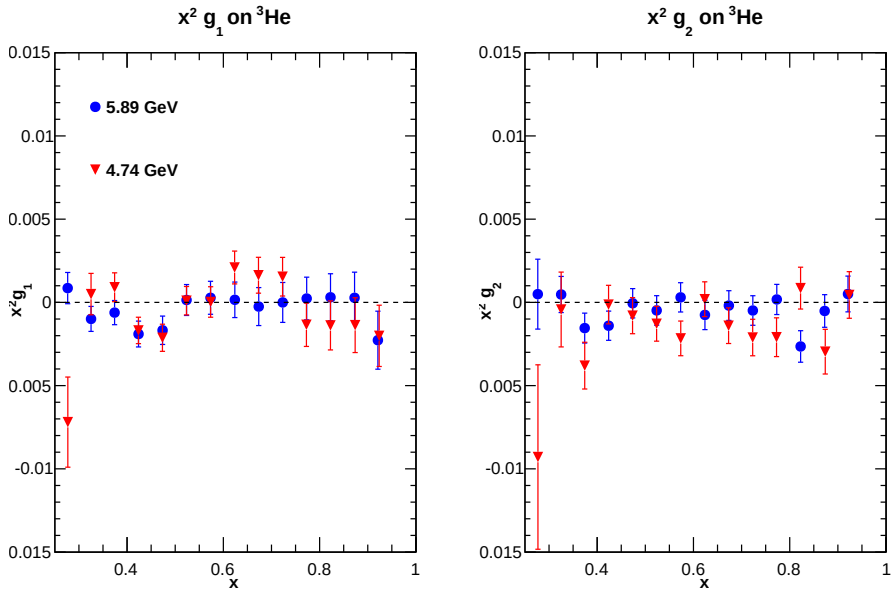
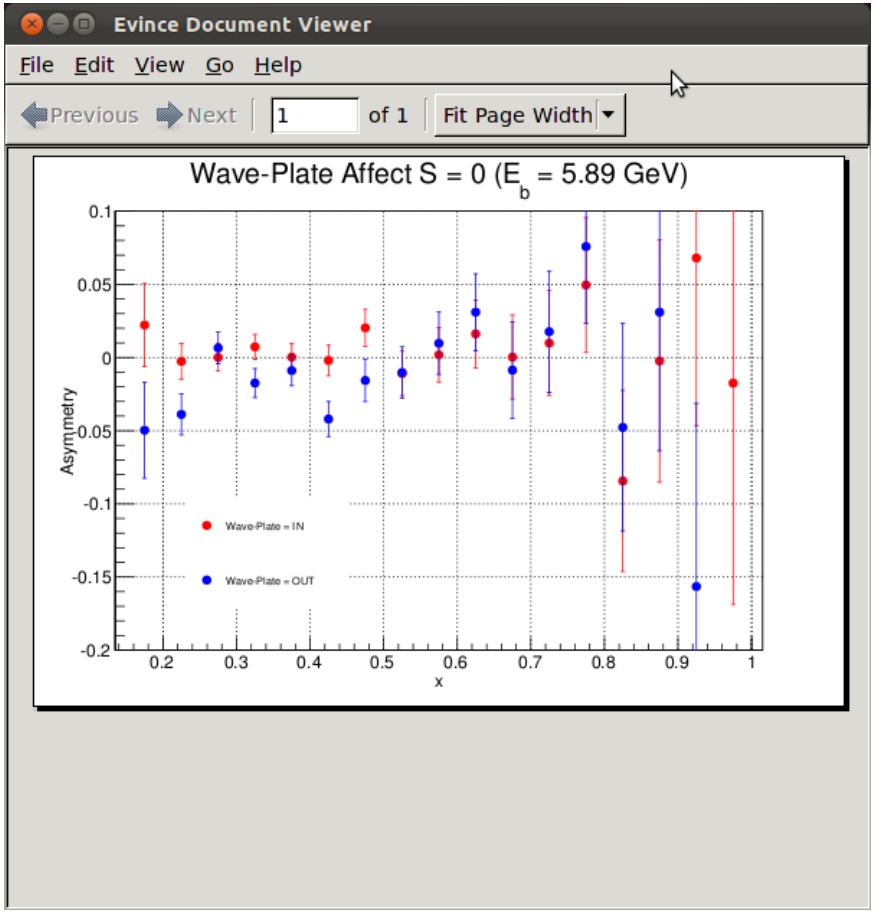


Figure: Preliminary g_1 and g_2 structure functions for 4.74 and 5.89 GeV data sets.

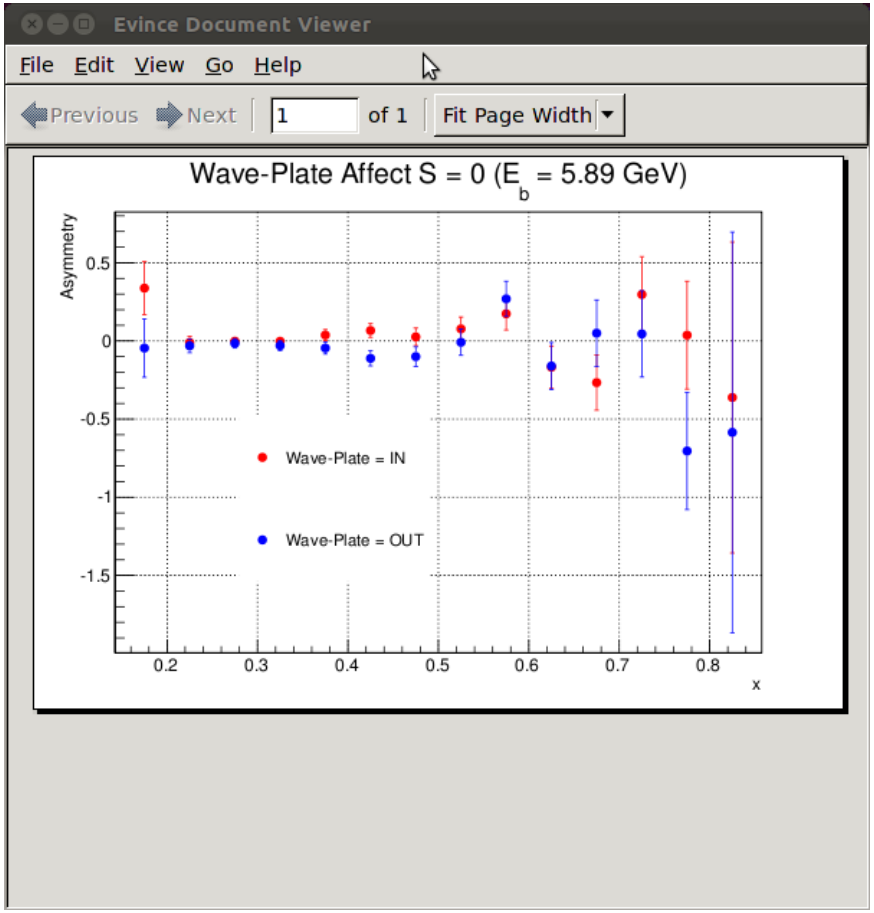
- Why the asymmetry smaller for the 5.89 GeV data set?
- Could the wave plate status be wrong in the 5.89 GeV data?
- Check wave plate using pion asymmetries (they larger than electron asymmetries)

Total Wave-Plate Asymmetries

Target Spin = 0°



(a) Electrons



(b) Pions

Figure: Corrected physics asymmetries (except for pair-production) for each wave plate configuration for 5.89 GeV data set.

BigBite Wave-Plate Asymmetries

Target Spin = 0°, $< x >$ = 0.325, $< p >$ = 930 MeV

Figure: E = 5.89 GeV, Runs 1532-1552 (electrons)

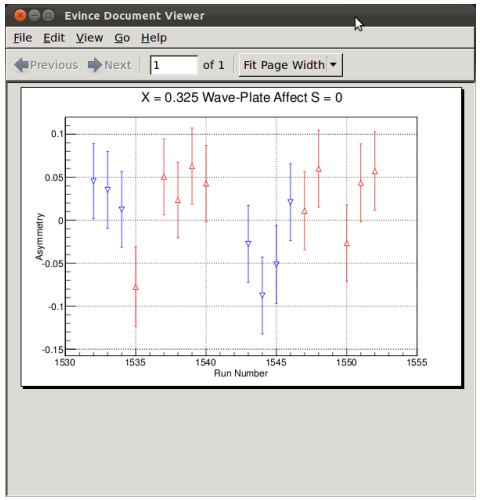


Figure: E = 5.89 GeV, Runs 1702-1719 (electrons)

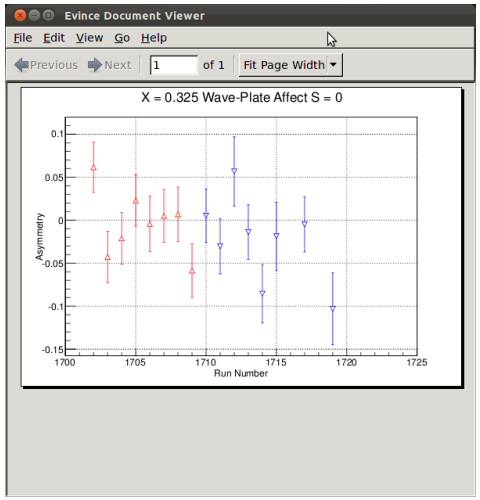


Figure: E = 5.89 GeV, Runs 1532-1552 (pions)

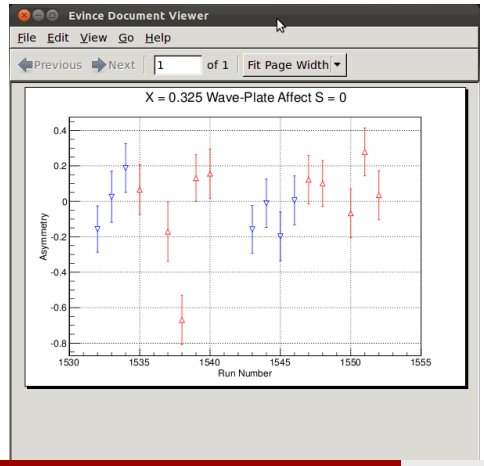
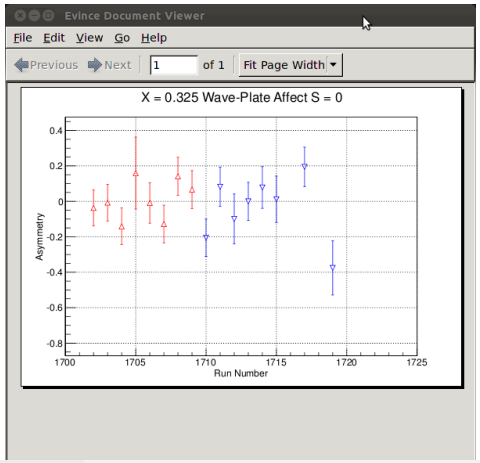


Figure: E = 5.89 GeV, Runs 1702-1719 (pions)



LHRS Pion Wave-Plate Asymmetries

Target Spin = 0°, $< x >$ = 0.325, $< p >$ = 930 MeV

Figure: E = 5.89 GeV, p = 600 MeV (pions)

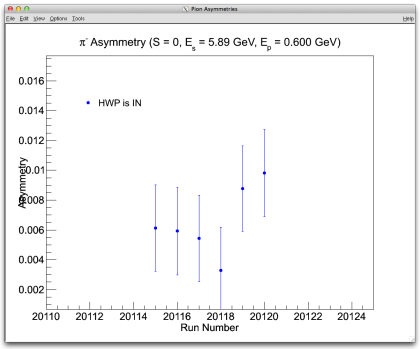


Figure: E = 5.89 GeV, p = 900 (pions)

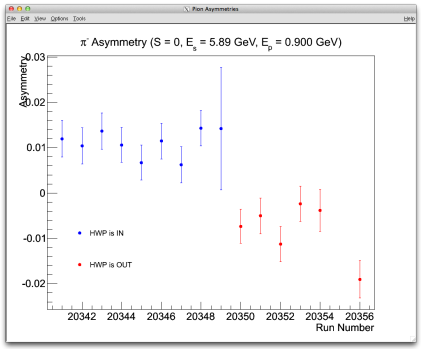


Figure: E = 5.89 GeV, p = 1200 MeV (pions)

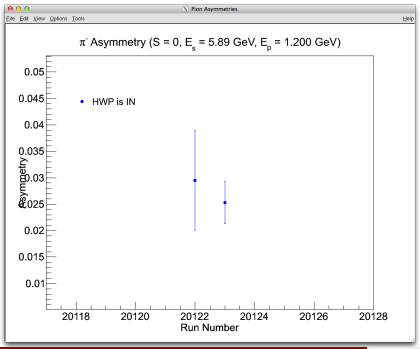
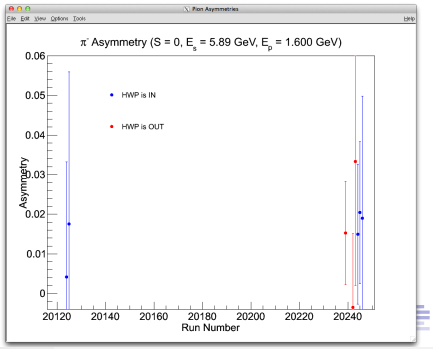


Figure: E = 5.89 GeV, p = 1600 MeV (pions)



Raw Pion BigBite and LHRS Asymmetries

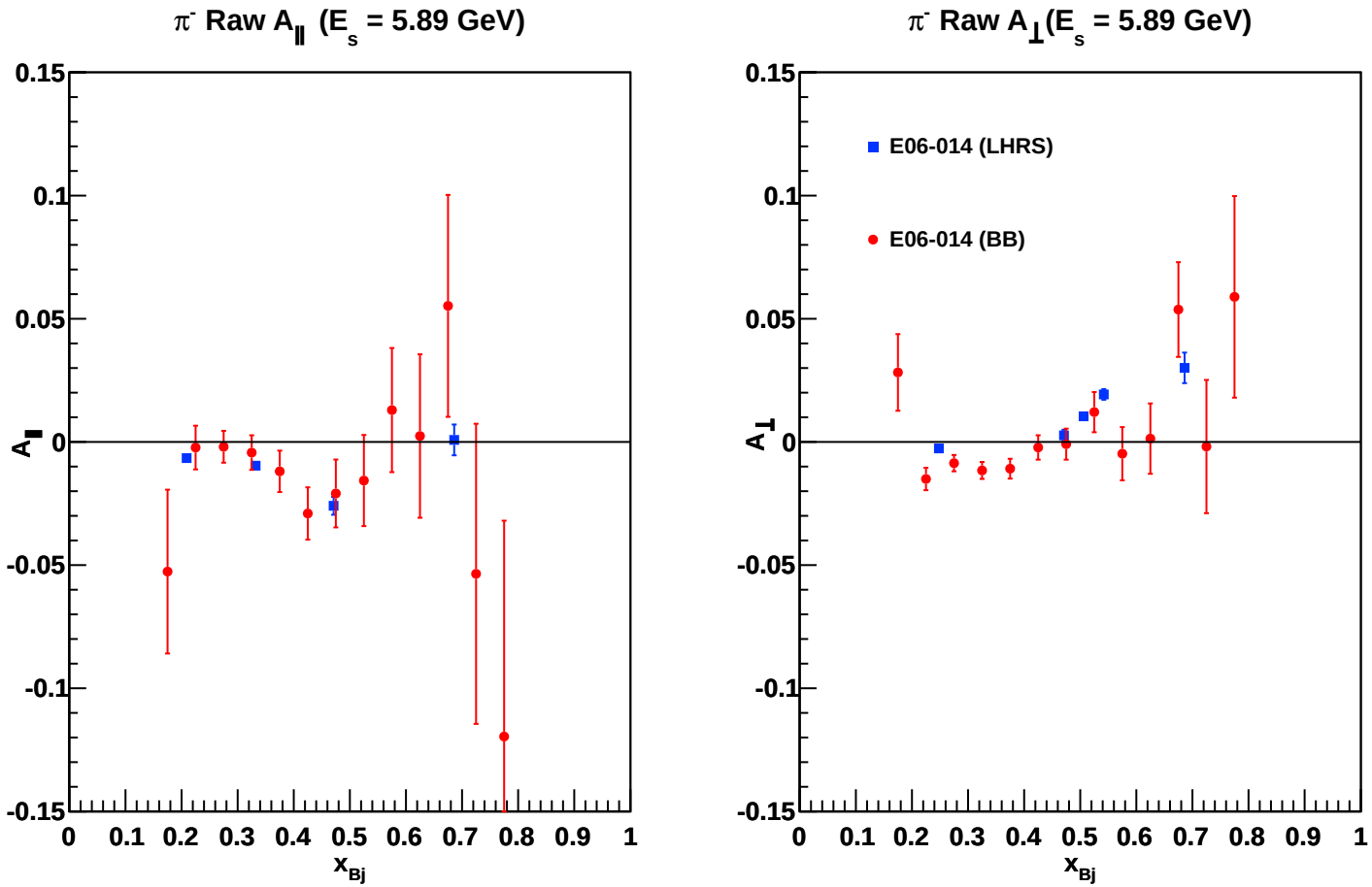


Figure: Comparison of the BigBite and LHRS raw pion asymmetries. There have been no dilution or other background corrections applied.

BigBite Pion and Electron Physics Asymmetries

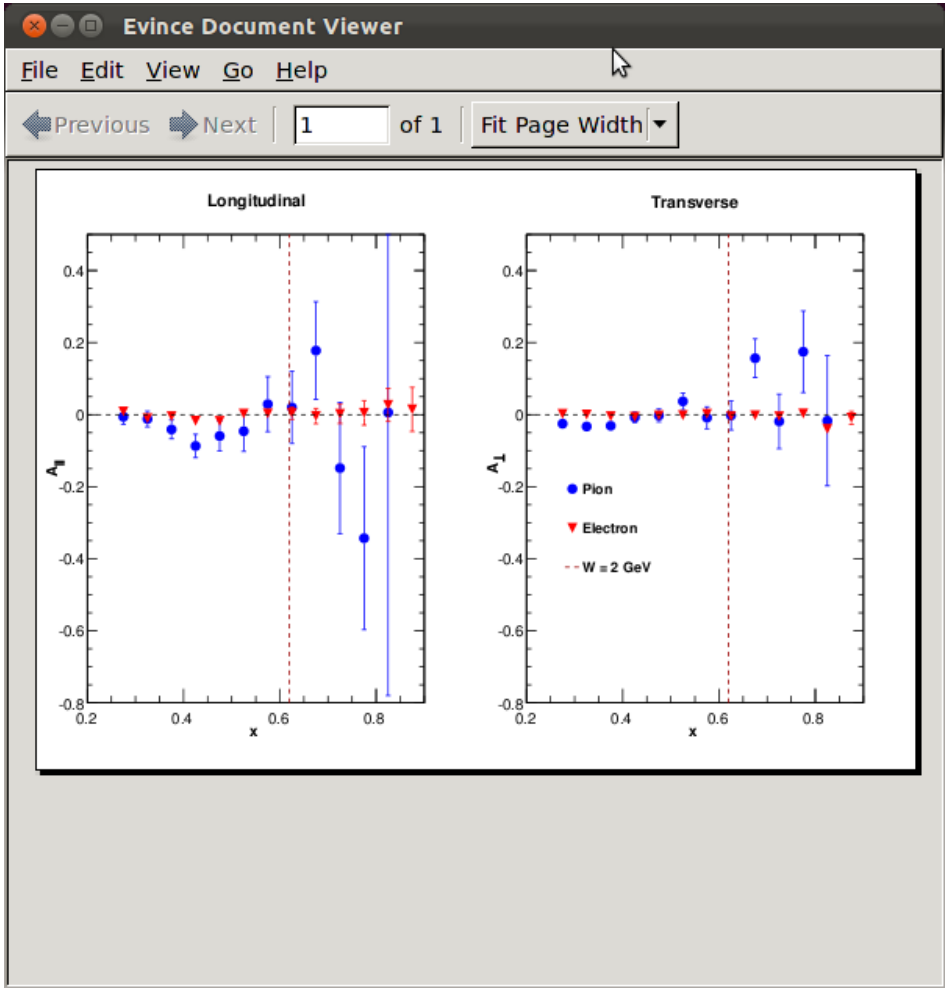


Figure: Comparison of the BigBite electron and pion parallel and perpendicular asymmetries (all corrections have been applied).

BigBite Pion and Electron A_1 and A_2 Asymmetries

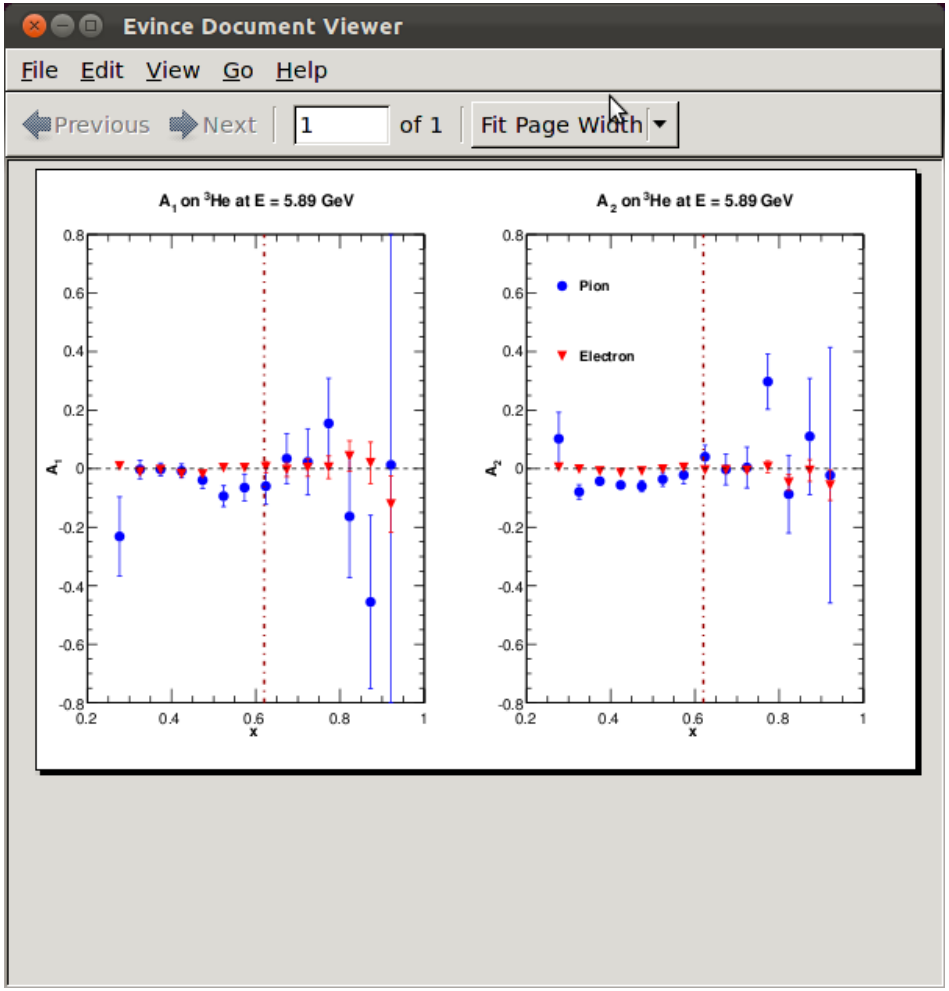


Figure: Comparison of the BigBite electron and pion A_1 and A_2 asymmetries (all corrections have been applied).

Wave-Plate Summary

- Pion half-wave plate asymmetries are much smaller than their uncertainties (makes it hard to see sign flip)
- All pion asymmetries are larger than the electron asymmetries
- BigBite pion asymmetries are consistent with LHRS pion asymmetries
- Wave plate changes have been thoroughly checked for all runs (see 12/20/2012 d2n wiki talk)
  - HALOG
  - Star/end of run variable
  - Compton asymmetries