Target Polarization ND3 16889 - 16935

September 12th 2022

Updated

Duke

Event Selection

Events within
/volatile/clas12/rg-c/production/ana_data/dst/train/sidisdvcs/ …

- Contain at least one FD electron (tagged with status < 0 for scattered)
- W > 2 cut (no elastic scattering)
- $8 < \theta_e < 35$ $E_e > 2.6$ GeV $|vz_e + 4.5| < 4$ cm

<u>For this analysis, inclusive events consist of…</u>

- Exactly 1 electron (~99% of events in the sidisdvcs .hipo files)

Still need detector topology fiducial cuts

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P_t formula

$$P_b P_t = \frac{\sum_{x,Q^2}\left[(N^+ - N^-)A_{||}(x,Q^2)f(x)\right]}{\sum_{x,Q^2}\left[(N^+ + N^-)A_{||}^2(x,Q^2)f^2(x)\right]}$$

N+ → Spins Parallel

N- → Spins Antiparallel

Key Components

- We bin in both x & Q^2 (2–dim)
- **$A_{||}(x,Q^2)$** = $A_{LL}(x,Q^2)D(x,Q^2)$

Tabulated by Sebastian
https://userweb.jlab.org/~kuhn/RGC/OptimalExtractionRelativePbPt.pdf

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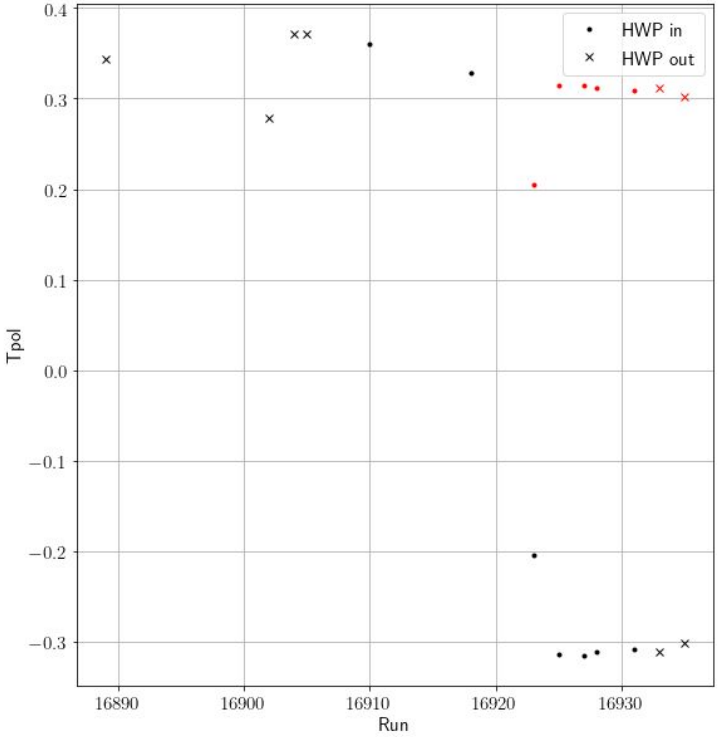
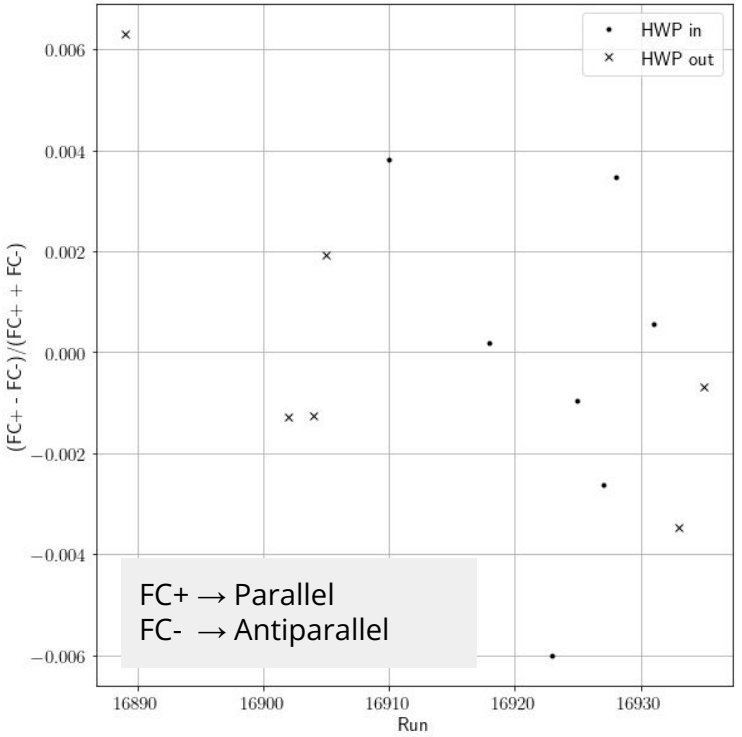
Tpol+HWP(RCDB) and FCup Asymmetry





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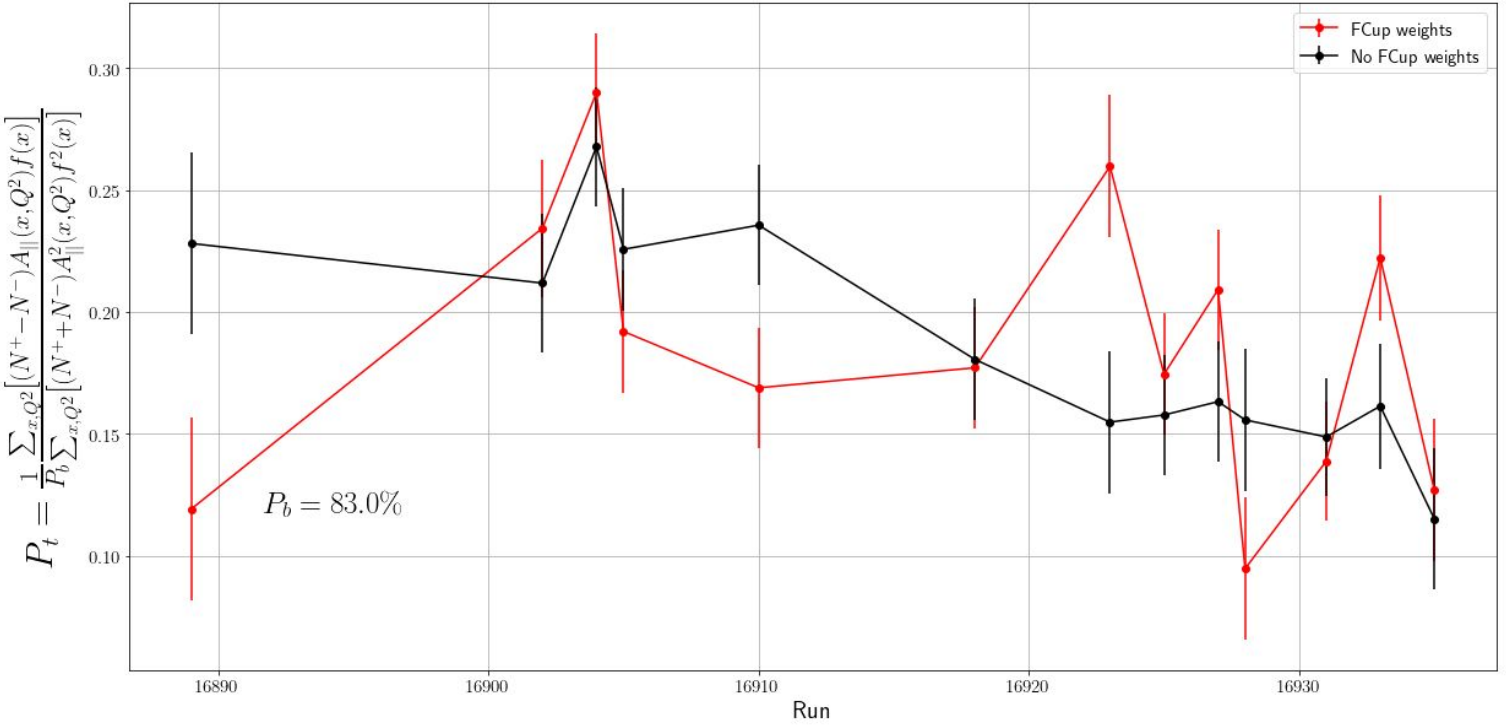
Small Bug

- After sending this slideshow to the analysis group initially, I realized that I was still using the proton A_LL tables.

- I show the *before/after* for this fix, and compare with Harut's results

Pt extraction (before bug fix)



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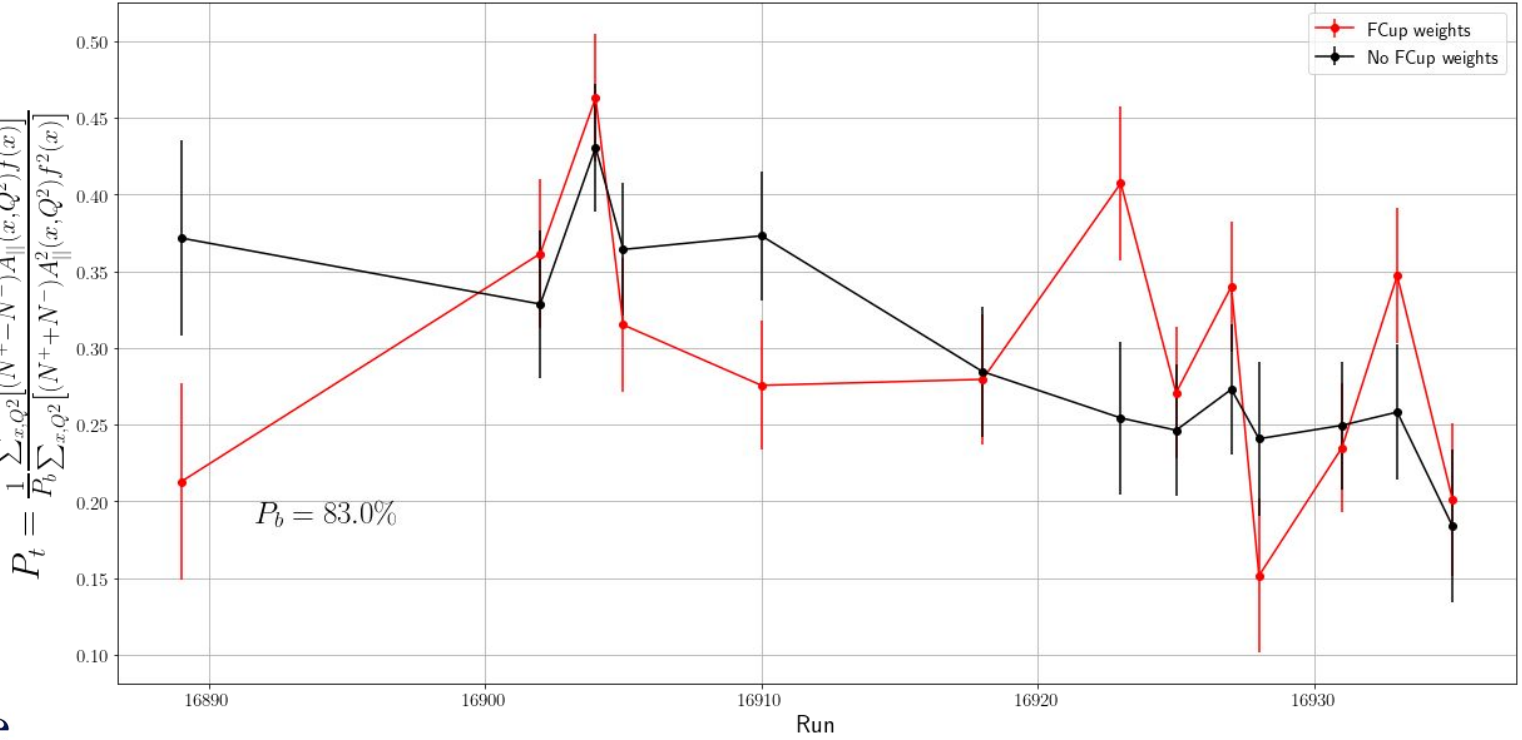
Pt extraction (after bug fix)



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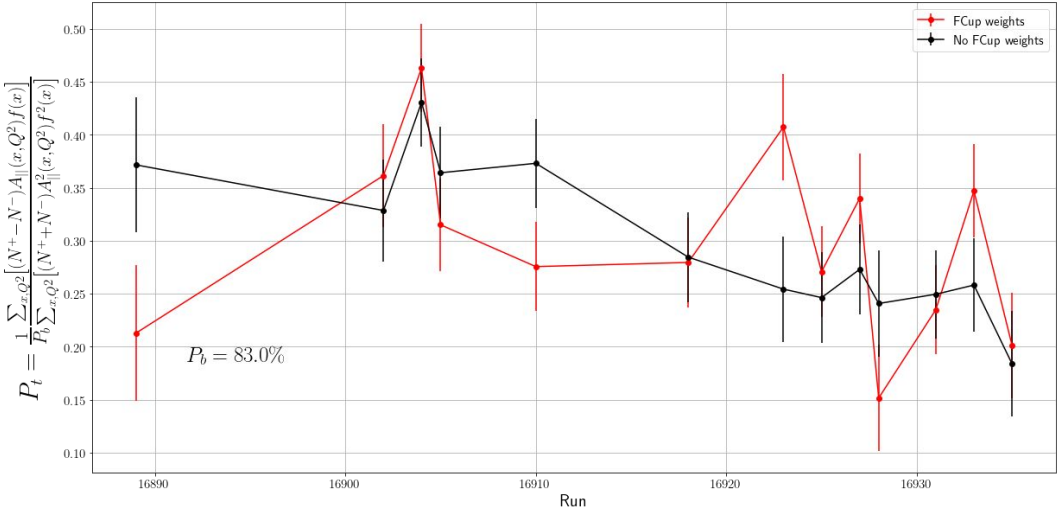
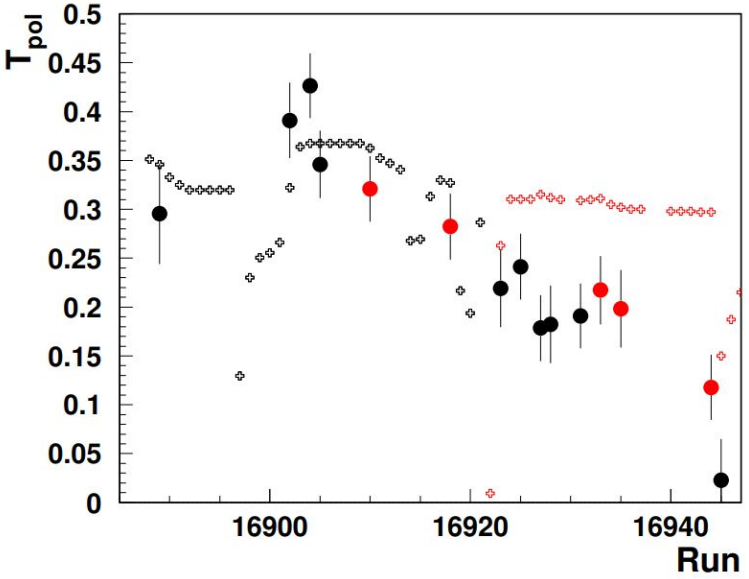
Comparison w/ Harut





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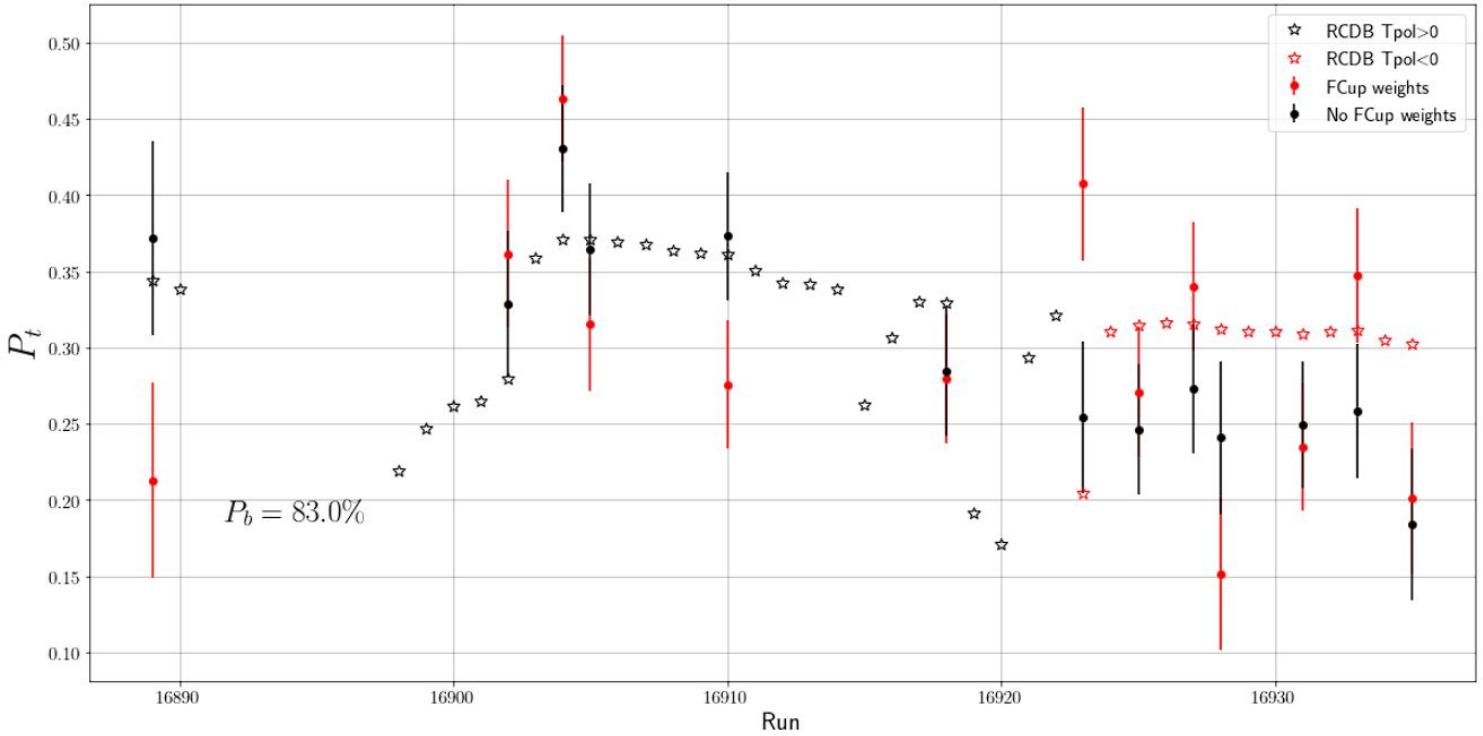
Overlaying Tpol RCDB



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Dataset for Analysis

/work/clas12/users/gmat/RGC_16889_16935_sebastian.csv

	Run	Target	Tpol RCDB	HWP	xmin	xmax	x	Q2min	Q2max	Q2	...	N-	N+err	N-err	n+	n-	n+err	n-err	Pb	Pt	Pt_err
0	16889	ND3	0.344011	out	0.10	0.15	0.125	0.9188	1.0969	1.00785	...	10.0	3.316625	3.162278	0.008920	0.008212	0.002689	0.002597	0.83	0.228144	0.037344
1	16889	ND3	0.344011	out	0.10	0.15	0.125	1.0969	1.3094	1.20315	...	2197.0	48.218254	46.872167	1.885354	1.804132	0.039100	0.038490	0.83	0.228144	0.037344
2	16889	ND3	0.344011	out	0.10	0.15	0.125	1.3094	1.5632	1.43630	...	11490.0	106.939235	107.191418	9.273510	9.435357	0.086718	0.088023	0.83	0.228144	0.037344
3	16889	ND3	0.344011	out	0.10	0.15	0.125	1.5632	1.8661	1.71465	...	15850.0	124.843903	125.896783	12.638766	13.015701	0.101237	0.103384	0.83	0.228144	0.037344
4	16889	ND3	0.344011	out	0.10	0.15	0.125	1.8661	2.2277	2.04690	...	8693.0	93.273791	93.236259	7.054874	7.138517	0.075636	0.076564	0.83	0.228144	0.037344
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
944	16935	ND3	-0.302145	out	0.65	0.70	0.675	6.4475	7.6969	7.07220	...	70.0	7.745967	8.366600	0.014241	0.016592	0.001838	0.001983	0.83	0.115245	0.029098
945	16935	ND3	-0.302145	out	0.65	0.70	0.675	7.6969	9.1884	8.44265	...	139.0	11.357817	11.789826	0.030617	0.032946	0.002696	0.002794	0.83	0.115245	0.029098
946	16935	ND3	-0.302145	out	0.65	0.70	0.675	9.1884	10.9689	10.07865	...	74.0	8.185353	8.602325	0.015902	0.017540	0.001943	0.002039	0.83	0.115245	0.029098
947	16935	ND3	-0.302145	out	0.70	0.75	0.725	7.6969	9.1884	8.44265	...	7.0	2.236068	2.645751	0.001187	0.001659	0.000531	0.000627	0.83	0.115245	0.029098
948	16935	ND3	-0.302145	out	0.70	0.75	0.725	9.1884	10.9689	10.07865	...	31.0	6.244998	5.567764	0.009256	0.007348	0.001482	0.001320	0.83	0.115245	0.029098

Pt_err formula to be updated soon...

Talking with Sebastian right now about how to treat FCup weights for Pt_err propagation

Duke