

Analysis Progress

for the d_2^n analysis meeting

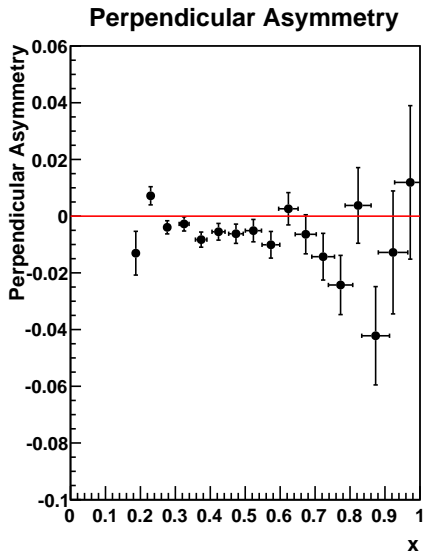
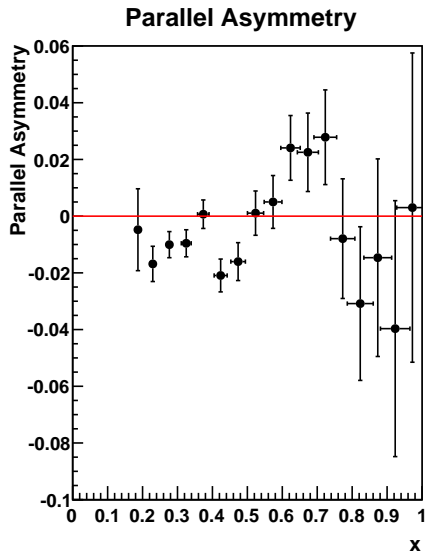
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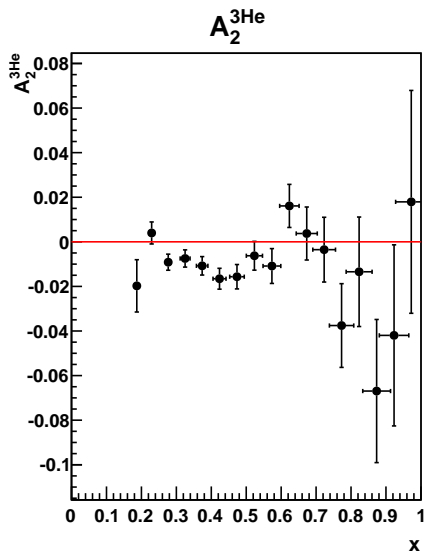
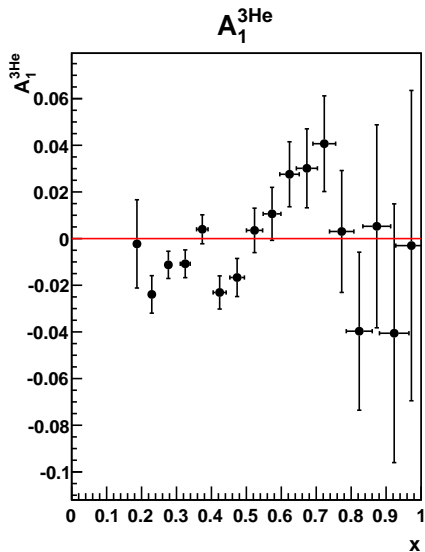
May 6, 2011

- 1 Final Thesis Results (Corrected D_{N_2} , Statistical Error)
- 2 5.9-GeV Helicity Analysis
- 3 What's Next?

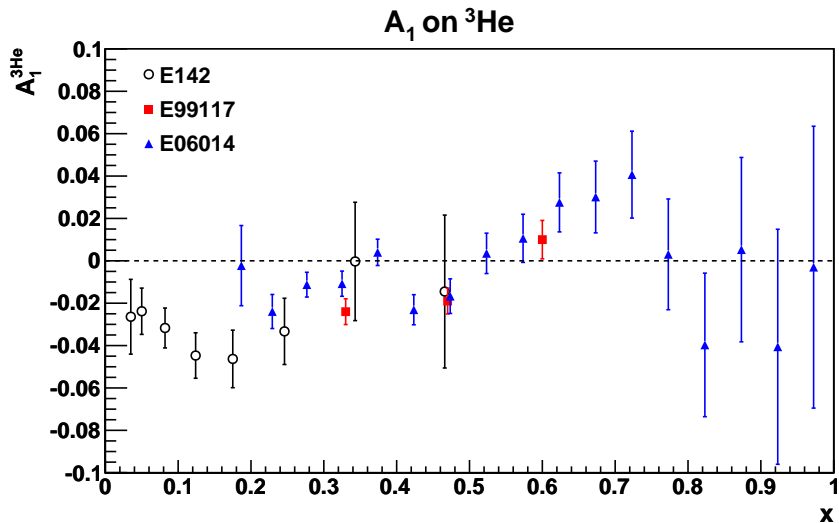
A_{\parallel} and A_{\perp}



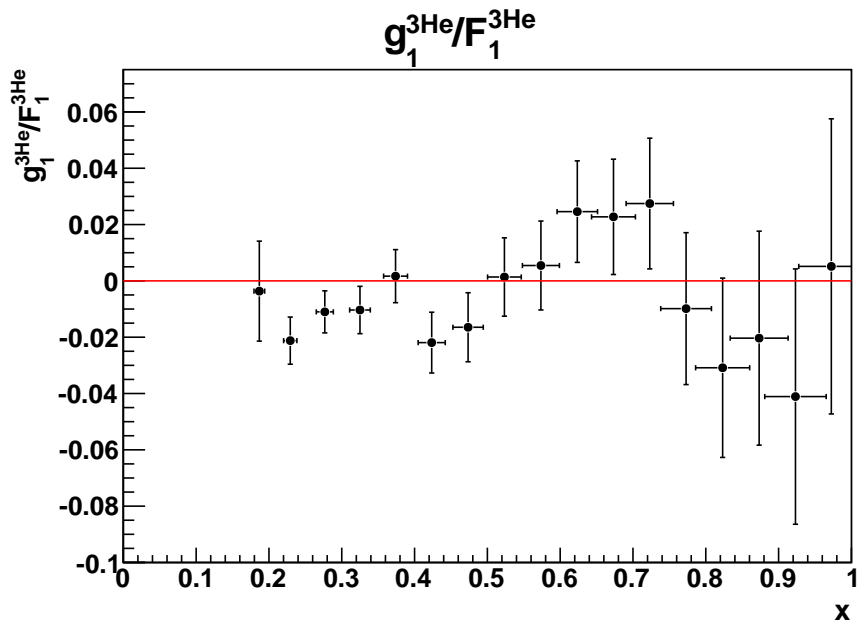
A_1 and A_2



More on A_1



Exact g_1/F_1 Ratio



Final Error Breakdown at $E_e = 4.74$ GeV

- These errors are absolute
- Remember that most systematic errors are multiplied by A in error propagation

$\langle x \rangle$	Errors on $A_{\parallel}^{3\text{He}}$					Errors on $A_{\perp}^{3\text{He}}$				
	Statistical	P_e	$P_{3\text{He}}$	D_{N_2}	$f_{bg}\Delta A$	Statistical	P_e	$P_{3\text{He}}$	D_{N_2}	$f_{bg}\Delta A$
0.187	0.0144	0.0100	0.0286	0.0028	0.0007	0.0077	0.0100	0.0289	0.0028	0.0004
0.229	0.0061	0.0100	0.0286	0.0029	0.0004	0.0032	0.0100	0.0289	0.0029	0.0002
0.277	0.0046	0.0100	0.0286	0.0031	0.0004	0.0023	0.0100	0.0289	0.0031	0.0002
0.325	0.0042	0.0100	0.0286	0.0031	0.0022	0.0021	0.0100	0.0289	0.0031	0.0011
0.374	0.0045	0.0100	0.0286	0.0031	0.0022	0.0022	0.0100	0.0289	0.0031	0.0011
0.424	0.0053	0.0100	0.0286	0.0031	0.0021	0.0026	0.0100	0.0289	0.0031	0.0011
0.474	0.0063	0.0100	0.0286	0.0030	0.0021	0.0031	0.0100	0.0289	0.0030	0.0011
0.523	0.0075	0.0100	0.0286	0.0030	0.0021	0.0037	0.0100	0.0289	0.0030	0.0010
0.574	0.0091	0.0100	0.0286	0.0030	0.0021	0.0045	0.0100	0.0289	0.0030	0.0011
0.624	0.0110	0.0100	0.0286	0.0029	0.0028	0.0054	0.0100	0.0289	0.0029	0.0015
0.673	0.0135	0.0100	0.0286	0.0029	0.0028	0.0066	0.0100	0.0289	0.0029	0.0015
0.723	0.0166	0.0100	0.0286	0.0030	0.0000	0.0082	0.0100	0.0289	0.0030	0.0000
0.773	0.0211	0.0100	0.0286	0.0031	0.0000	0.0104	0.0100	0.0289	0.0031	0.0000
0.823	0.0271	0.0100	0.0286	0.0034	0.0000	0.0133	0.0100	0.0289	0.0034	0.0000
0.873	0.0348	0.0100	0.0286	0.0036	0.0000	0.0172	0.0100	0.0289	0.0036	0.0000
0.923	0.0451	0.0100	0.0286	0.0038	0.0000	0.0217	0.0100	0.0289	0.0038	0.0000
0.972	0.0545	0.0100	0.0286	0.0034	0.0000	0.0270	0.0100	0.0289	0.0034	0.0000

Møller Helicity Measurements (i)

- We need to know the absolute helicity of electrons in the hall
- Depending on configuration, actual helicity may be *opposite* to helicity logic readout
- Polarimeter measurements break the degeneracy:
- With HWP *out*, a *positive* Møller polarization means real helicity and logic readout match

Date	Beam Energy (GeV)	Measured Beam Polarization	IHWP Status
7 February	5.90	$-0.7943 \pm 0.0013_{stat} \pm 0.0159_{syst}$	in
9 February	1.23	$-0.7164 \pm 0.0014_{stat} \pm 0.0143_{syst}$	in
11 February	5.90	$+0.7450 \pm 0.0015_{stat} \pm 0.0149_{syst}$	out
19 February	5.90	$-0.7448 \pm 0.0011_{stat} \pm 0.0149_{syst}$	in
3 March	5.90	$-0.7970 \pm 0.0012_{stat} \pm 0.0159_{syst}$	in
6 March	4.74	$+0.6394 \pm 0.0010_{stat} \pm 0.0128_{syst}$	out
12 March	4.74	$-0.6079 \pm 0.0013_{stat} \pm 0.0122_{syst}$	out

Møller Helicity Measurements (ii)

- We use this information to tabulate helicity conditions during each configuration
- We report the relationship between physical helicity and helicity readback from each measurement
- Next step: Map this to production runlist

Date	Beam Energy (GeV)	HWP out	HWP in
7 February	5.90	same	opposite
9 February	1.23	same	opposite
11 February	5.90	same	opposite
19 February	5.90	same	opposite
3 March	5.90	same	opposite
6 March	4.74	same	opposite
12 March	4.74	opposite	same

What's Next?

- Talk at Hall A collaboration meeting?
- Make progress on neutron extraction
- Helicity breakdown of 5.9-GeV runlist
- Updates to wiki