Beam Single-Spin Asymmetry Progress

Alicia Postuma

University of Regina
KaonLT Experiment, Jefferson Lab Hall C

Group meeting

General Updates

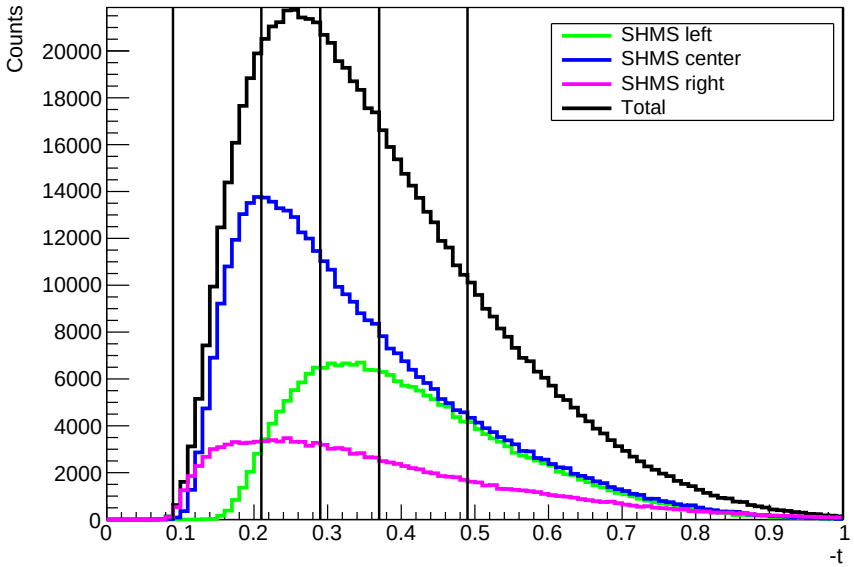
- Fixed dummy target subtraction
- Analyzed Q^2=4.4, W=2.74
- Analyzed Q^2=2.115, W=2.95
- Dummy target BSA
- Investigate bin 2

PID cuts

- Variables looked very similar between settings: same cuts used
- Since previous results, widened missing mass window and increased NPE in SHMS aerogel

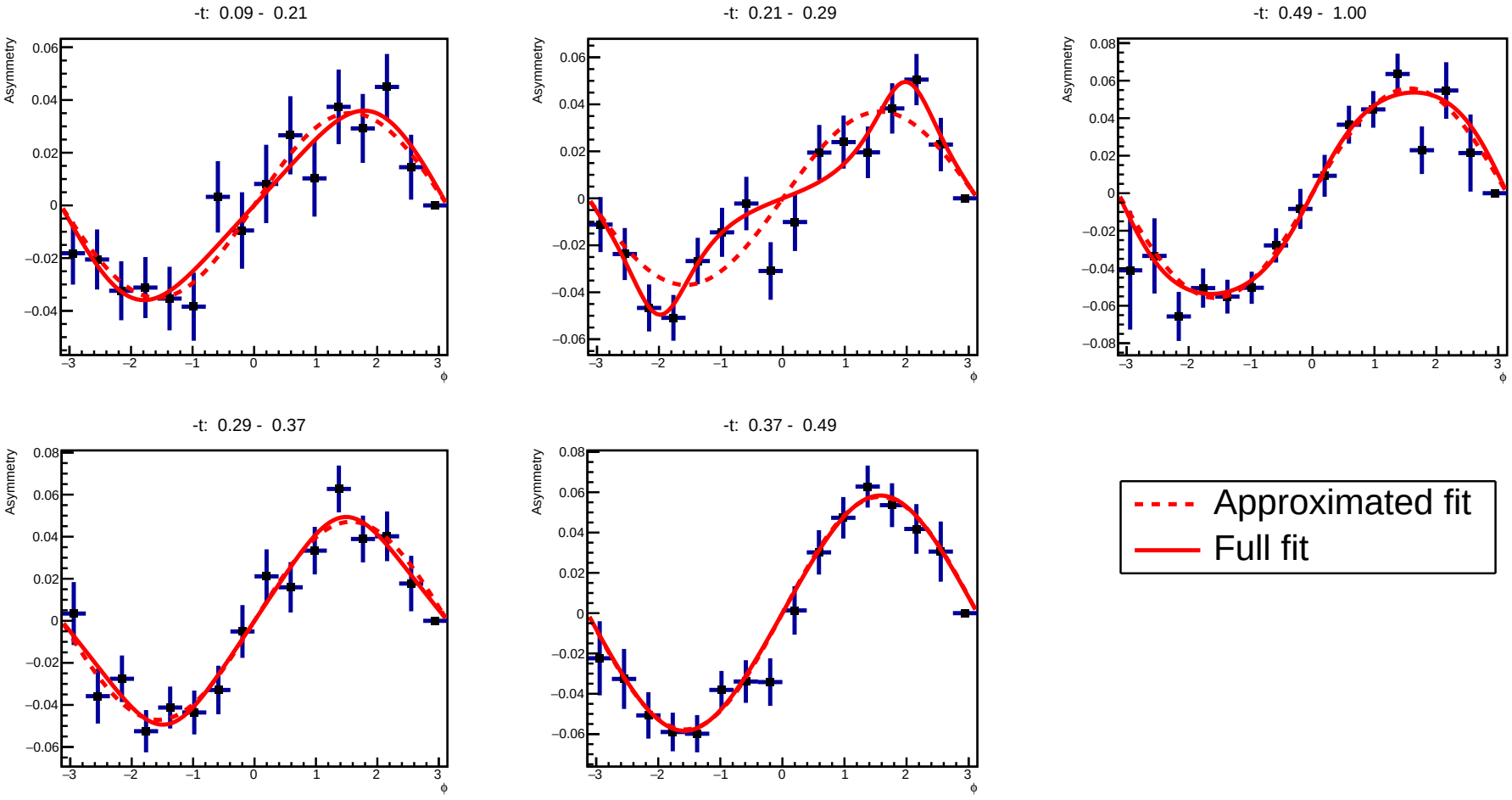
$$\text{P_aero_npeSum} > 3$$
$$\text{H_cer_npeSum} > 1.5$$
$$0.88 < \text{MMpi} < 0.98$$
$$\text{H_cal_etottracknorm} > 0.8$$
$$\text{P_cal_etottracknorm} > 0.05$$
$$\text{abs(H_gtr_beta-1)} < 0.2$$
$$\text{abs(P_gtr_beta-1)} < 0.5$$

Binning Q^2=3, W=2.32



Low	High	Width	Events
0.09	0.21	0.12	107457
0.21	0.29	0.08	147586
0.29	0.37	0.08	177052
0.37	0.49	0.12	168172
0.49	1	0.51	172644

Asymmetry Q^2=3, W=2.32



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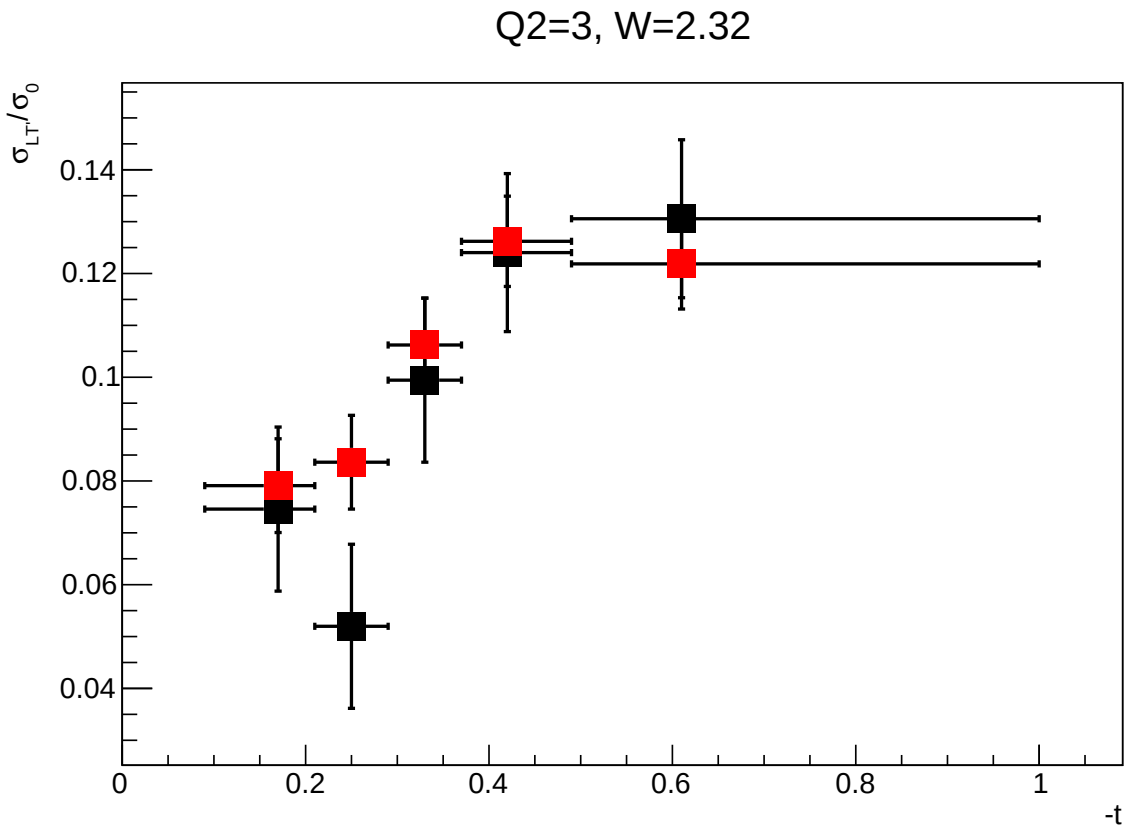
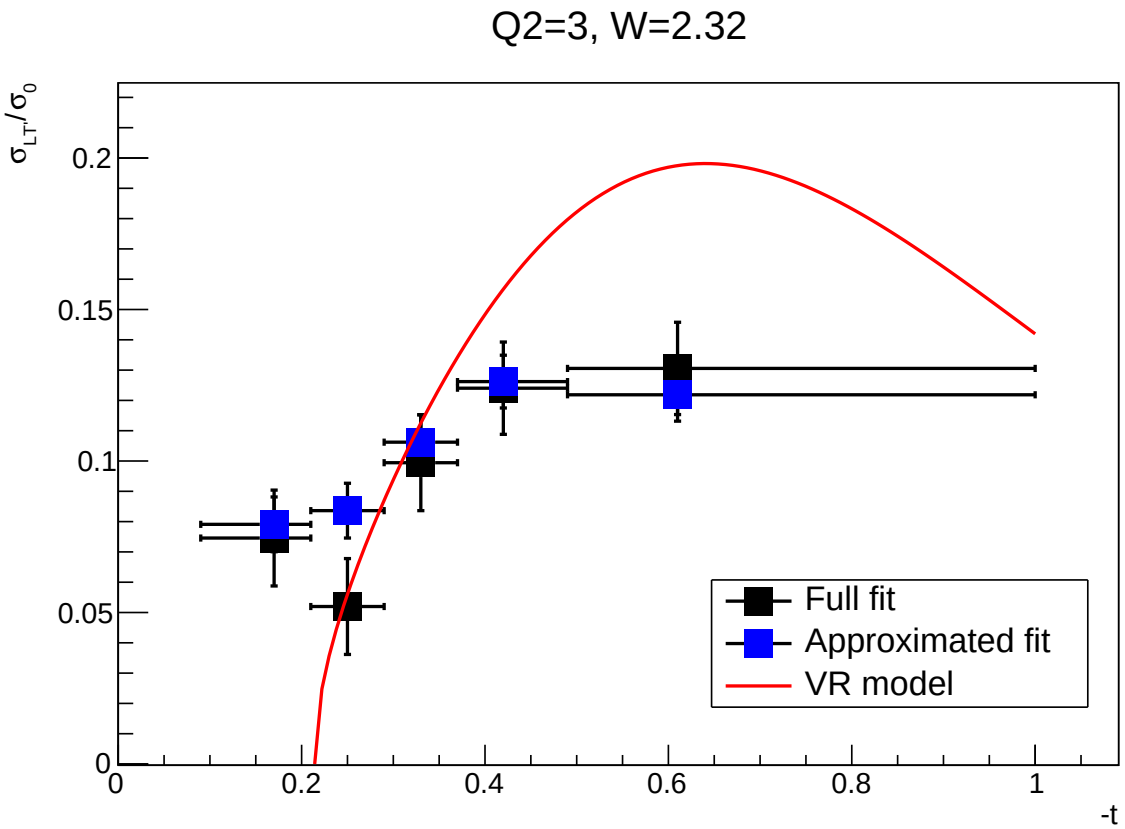
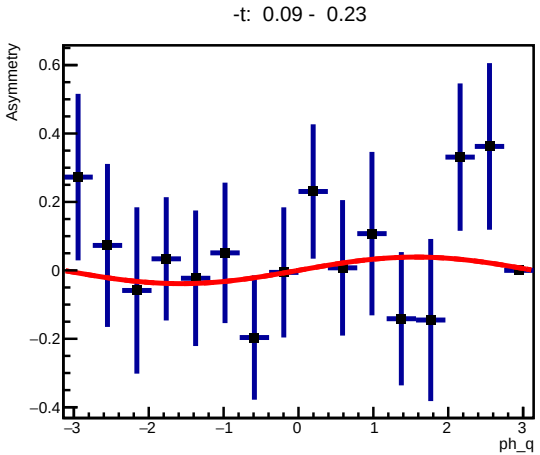
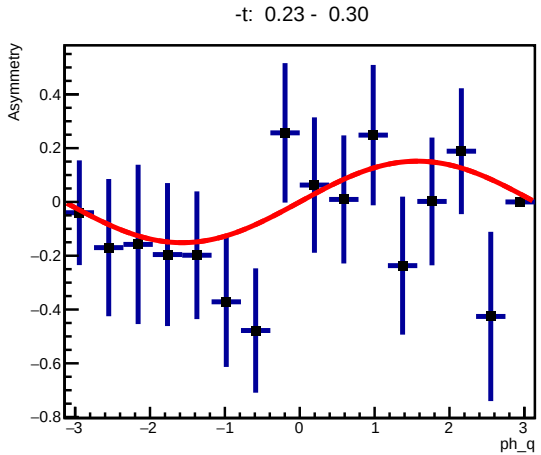


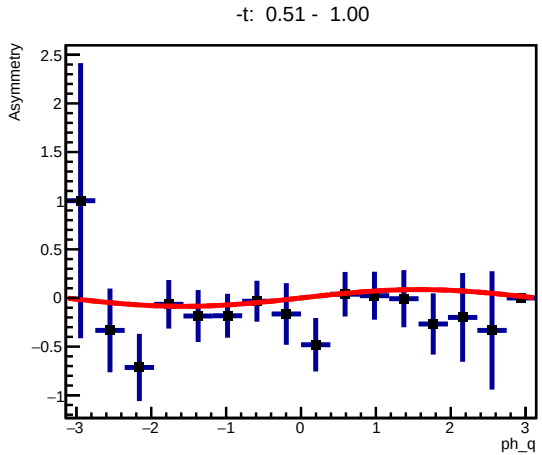
VR model Q^2=3, W=2.32

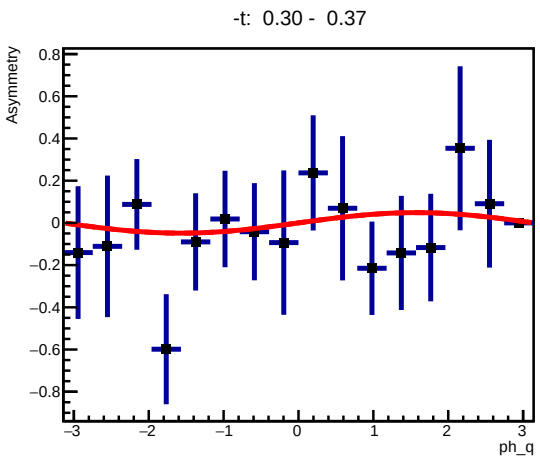


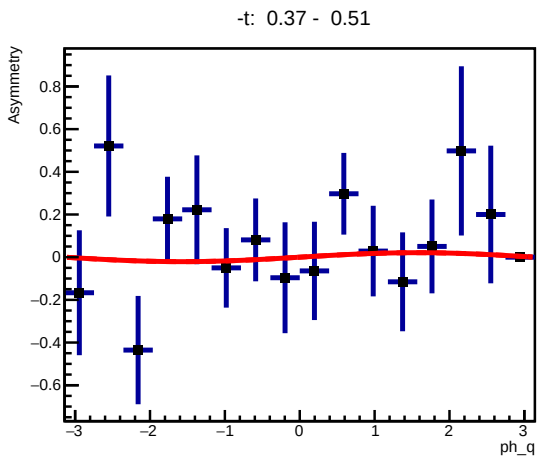
Asymmetry Q^2=3, W=2.32 - Aluminum

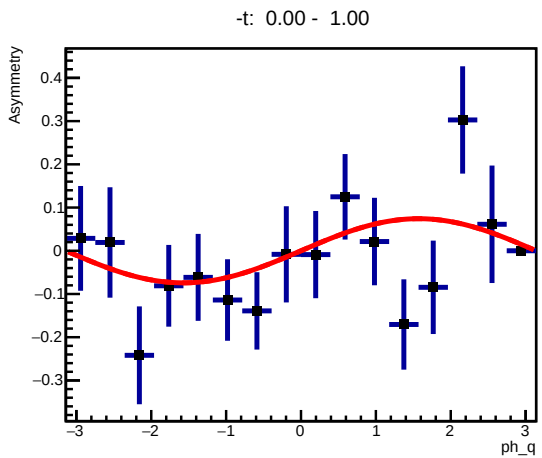




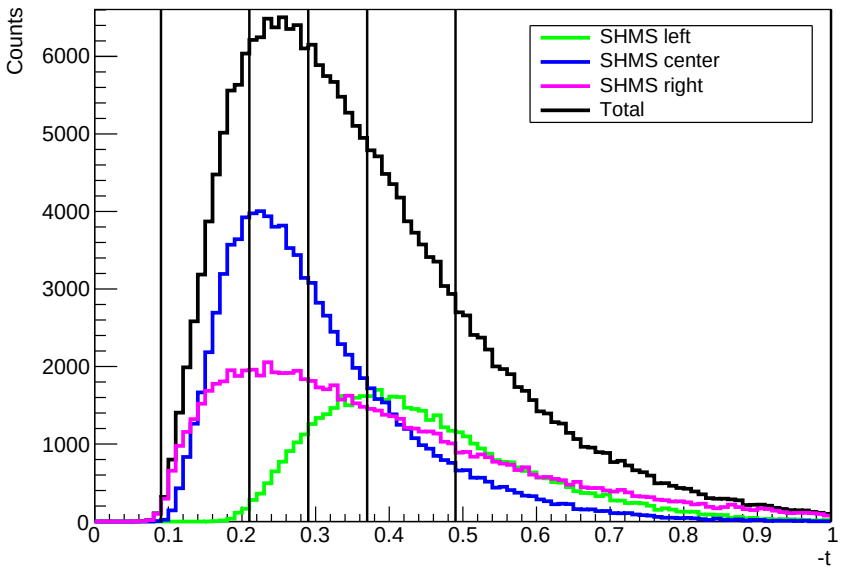






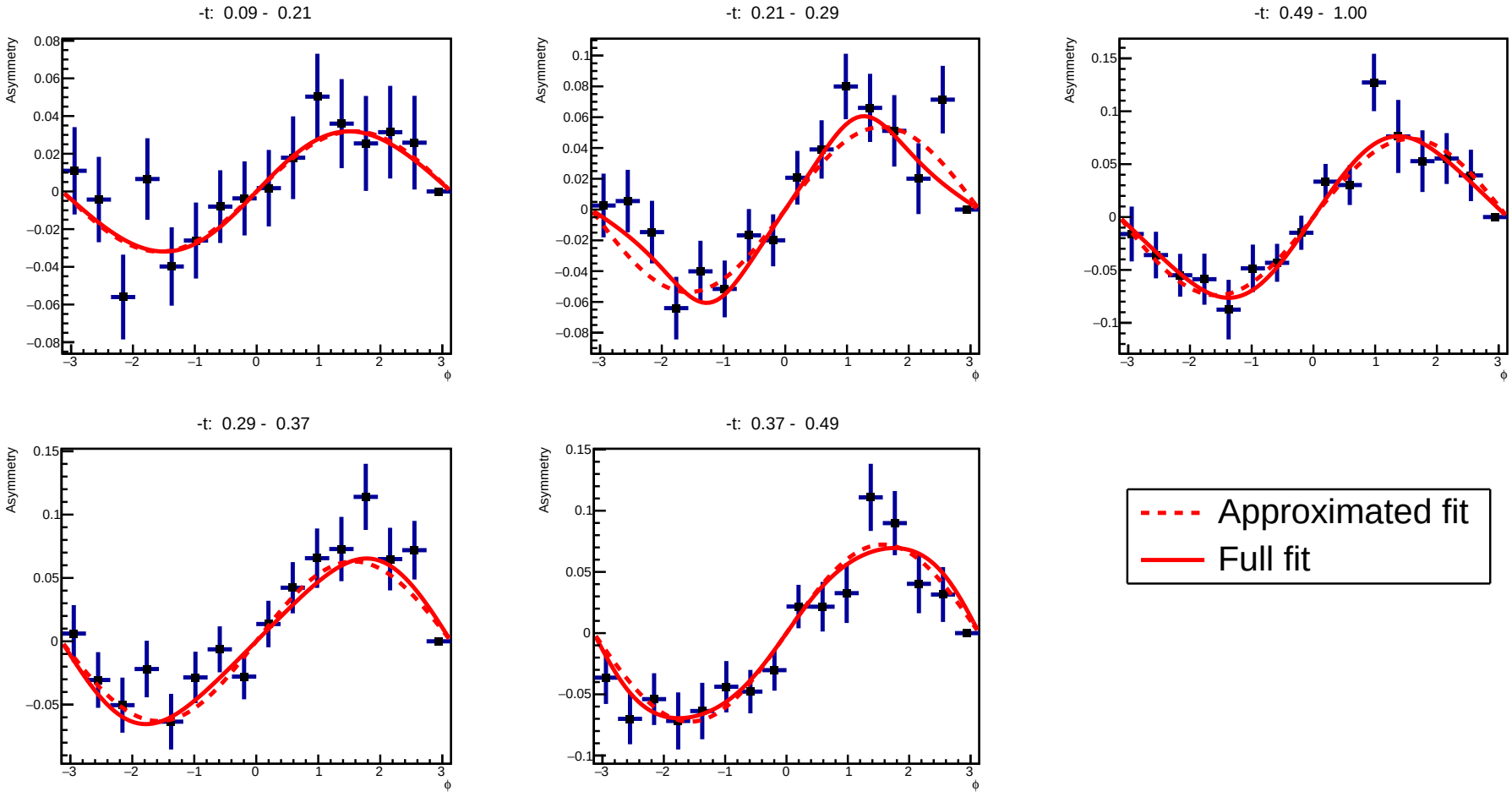


Binning Q^2=4.4, W=2.74



Low	High	Width	Events
0.09	0.21	0.12	34969
0.21	0.29	0.08	44218
0.29	0.37	0.08	51822
0.37	0.49	0.12	48441
0.49	1	0.51	47939

Asymmetry Q^2=4.4, W=2.74



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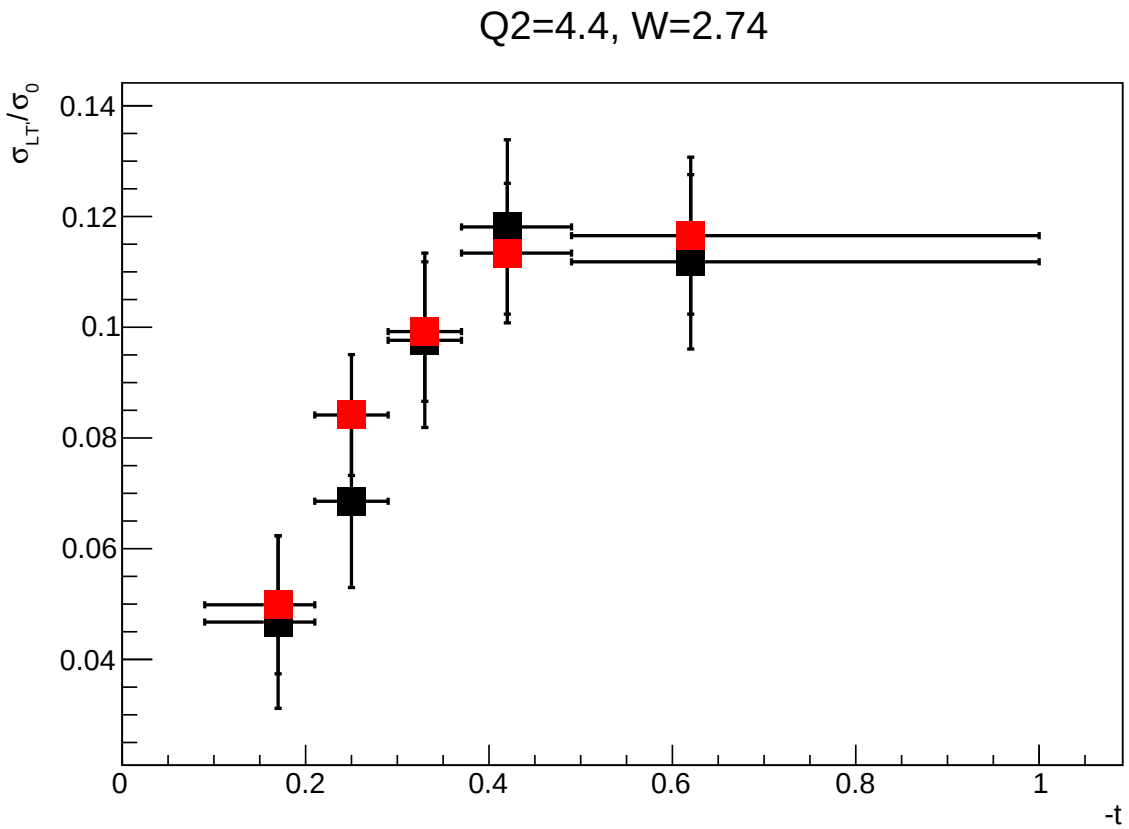

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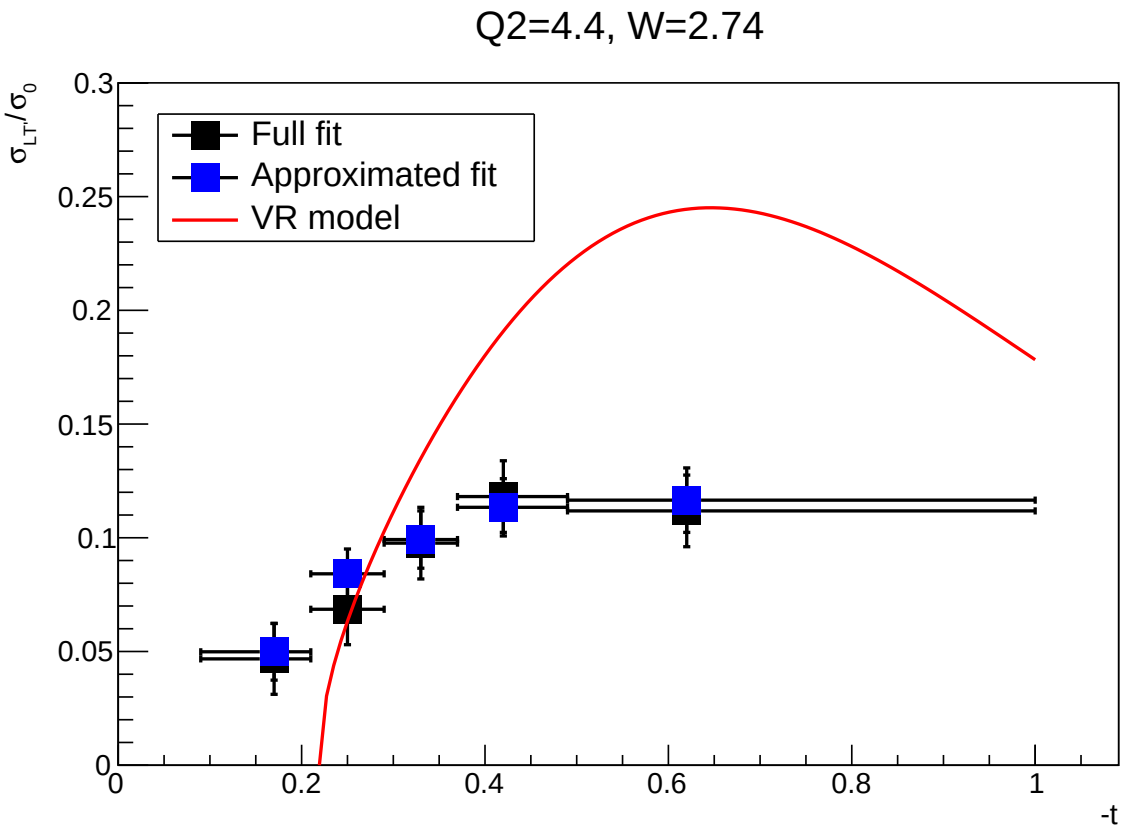
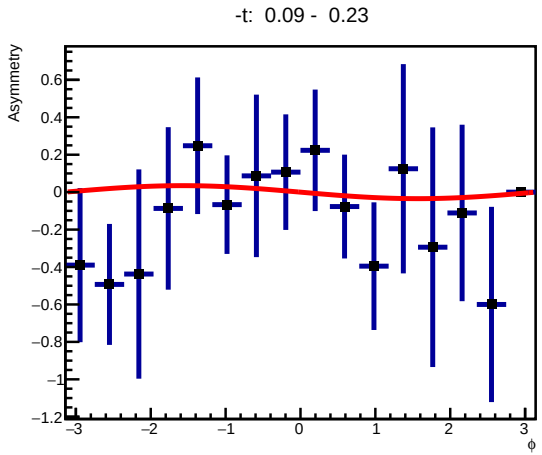
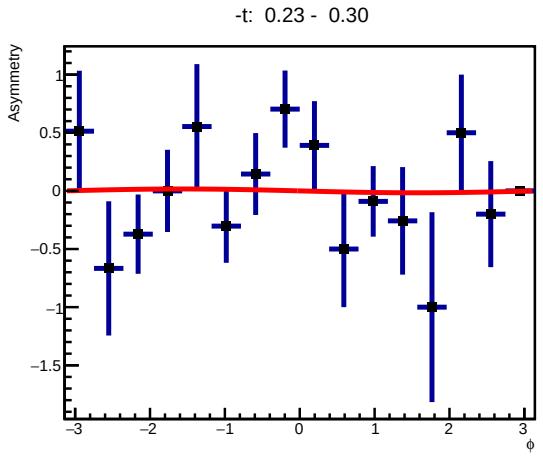
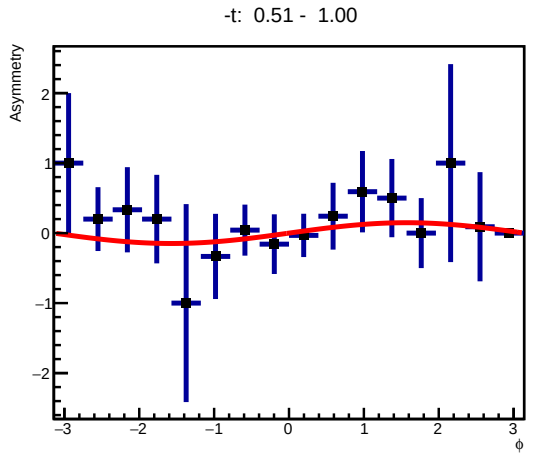
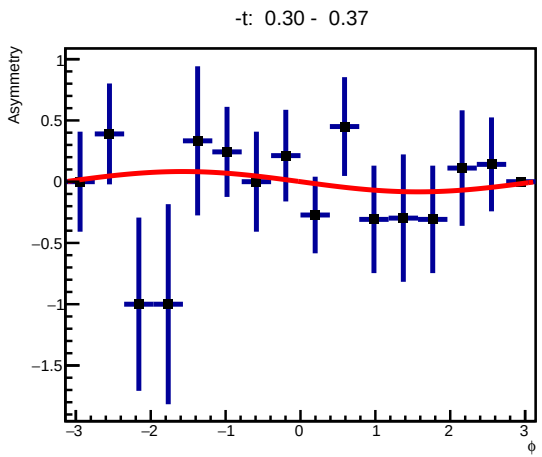


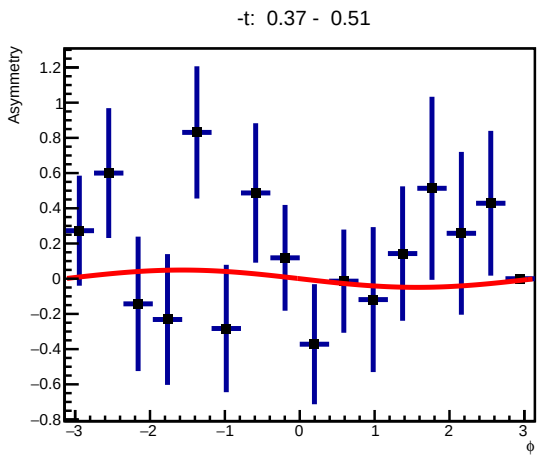
Asymmetry Q^2=4.4, W=2.74 - Aluminum

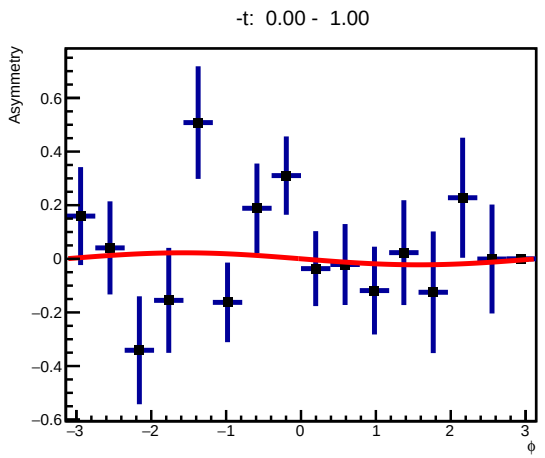




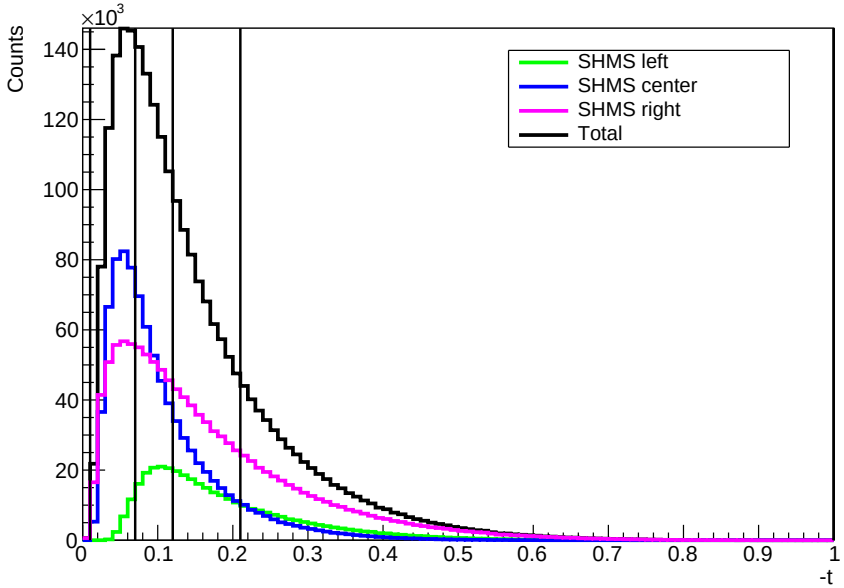








Binning Q^2=2.115, W=2.95



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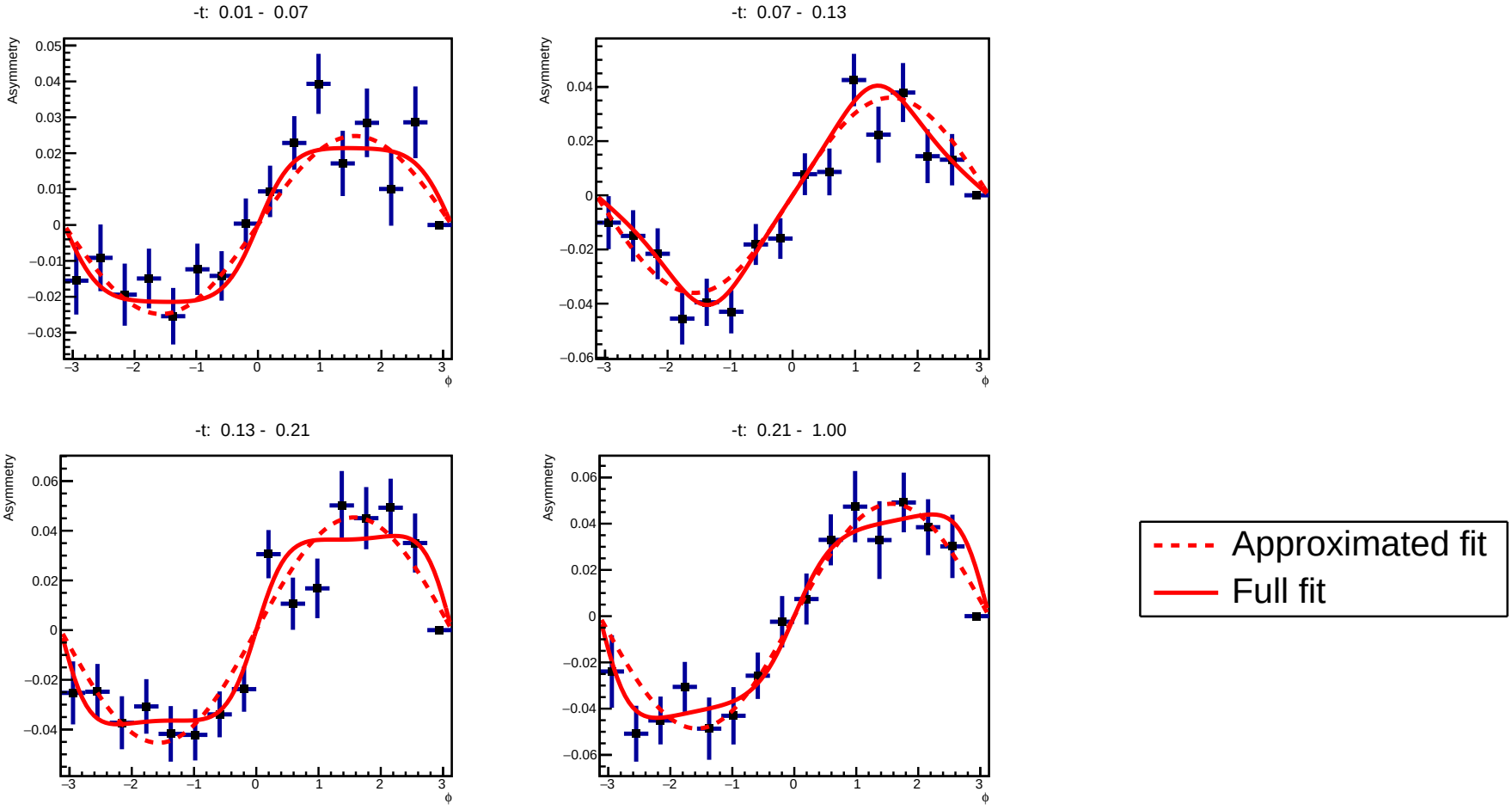

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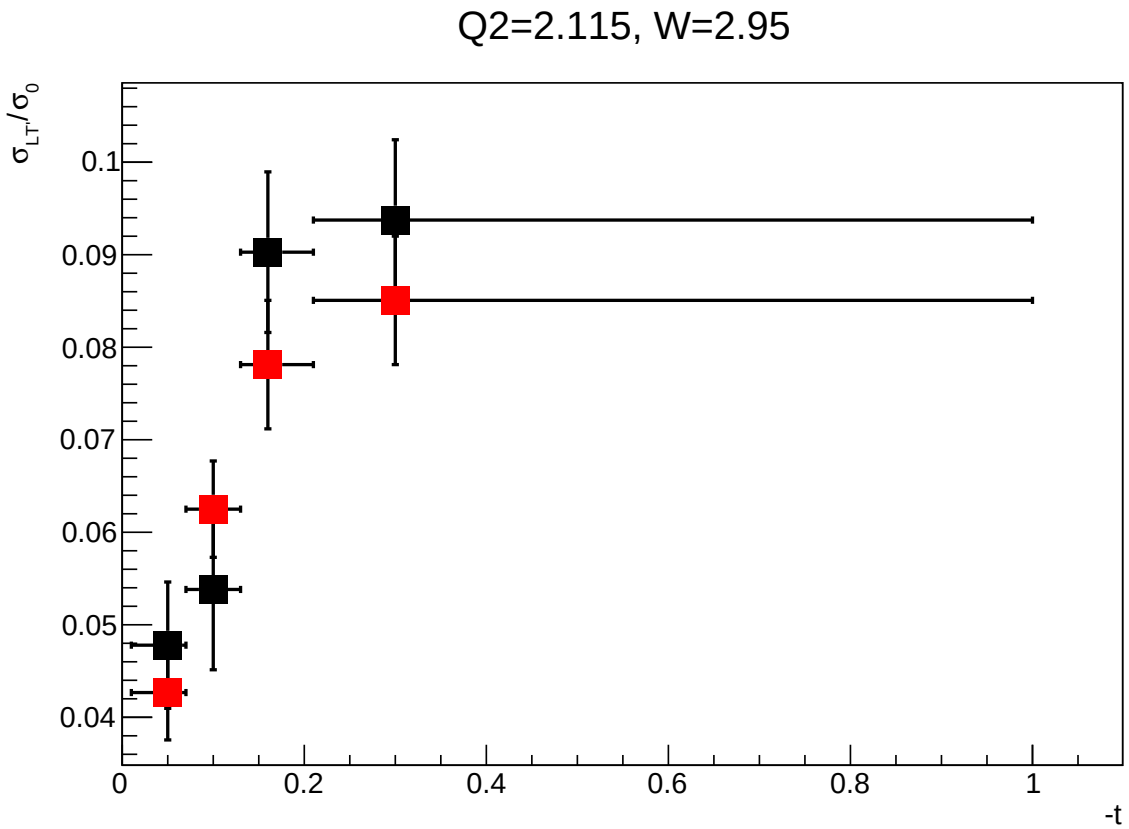

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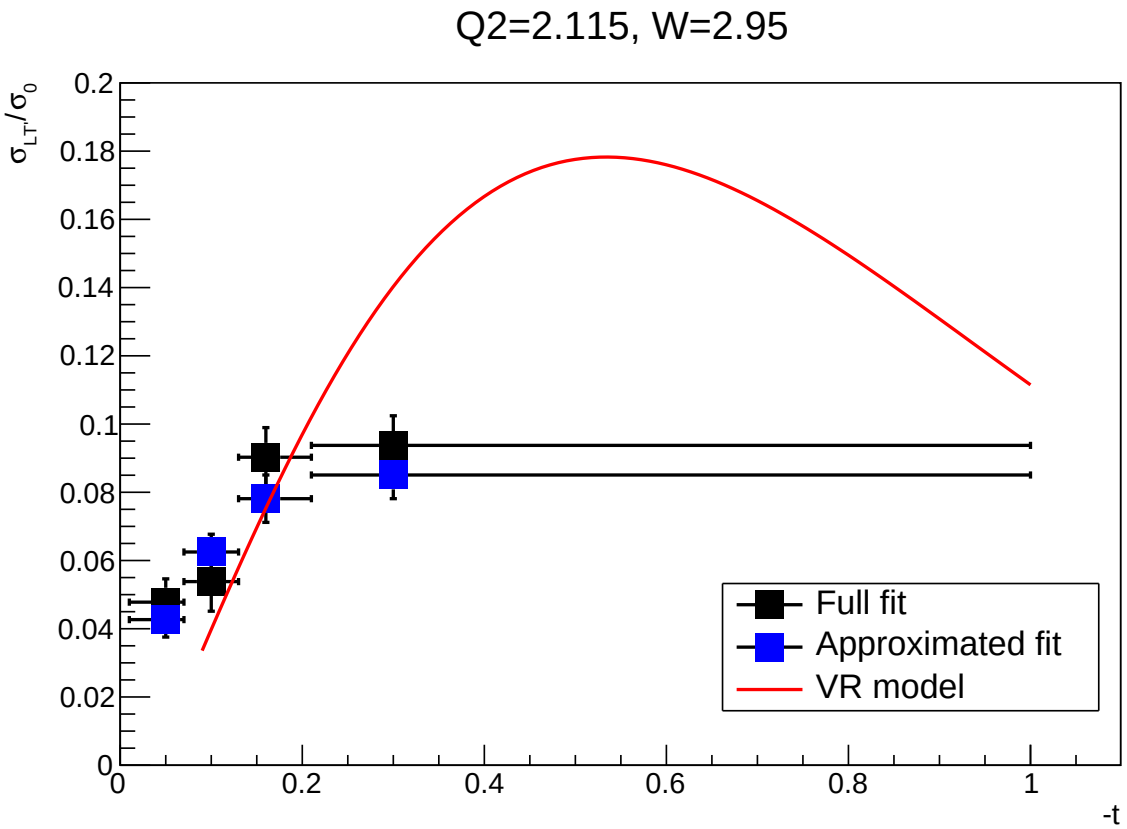
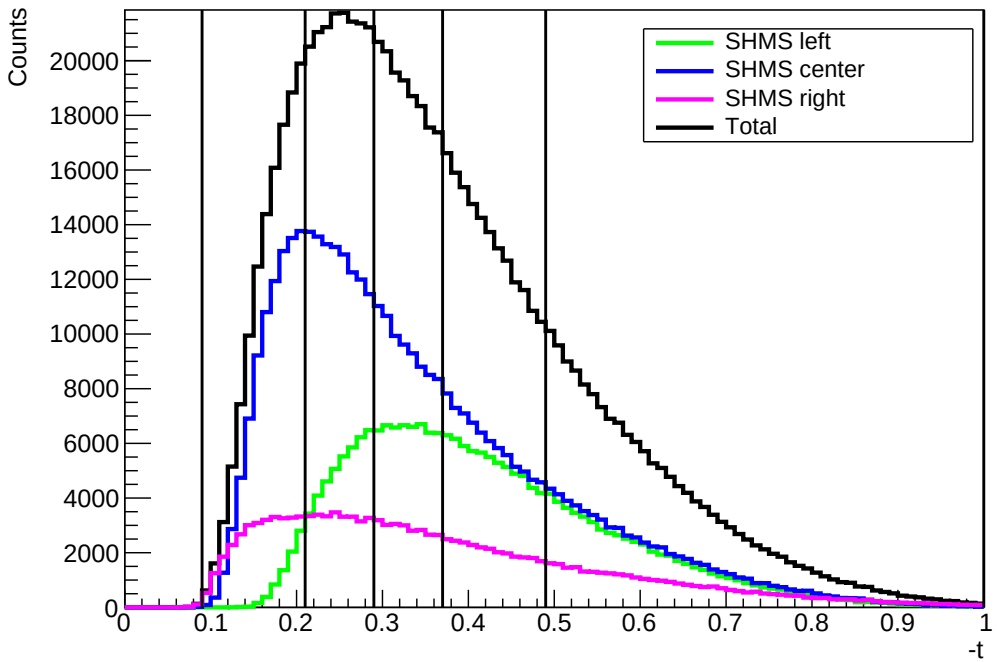
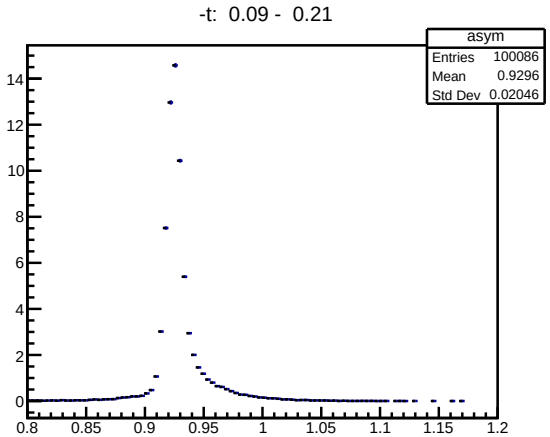


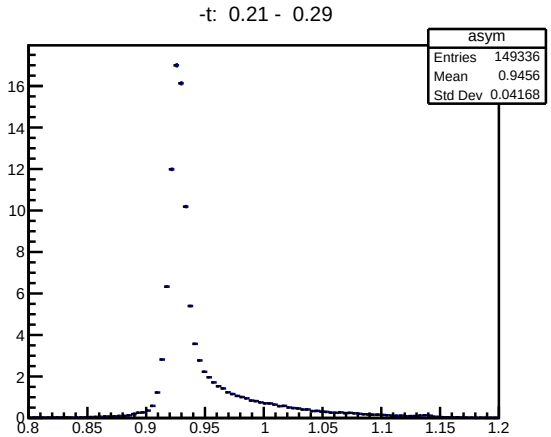
Bin 2

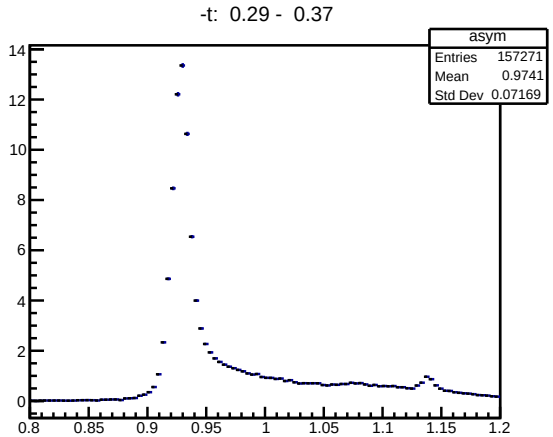
- Bin at peak of $-t$ distribution is always the odd one out
- Looking at different variables in each bin - nothing odd seen in MMpi, delta, or xAtCer/yAtCer/xAtAreo/yAtAero distributions in this bin

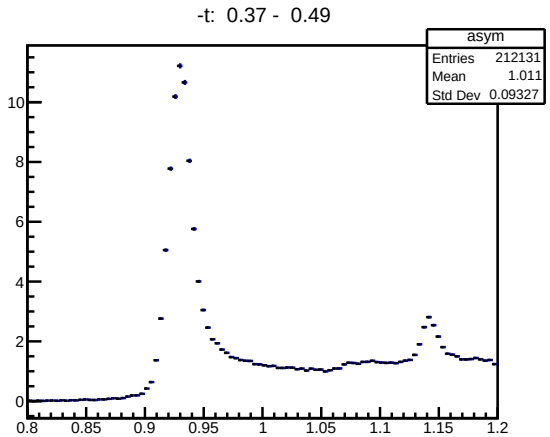


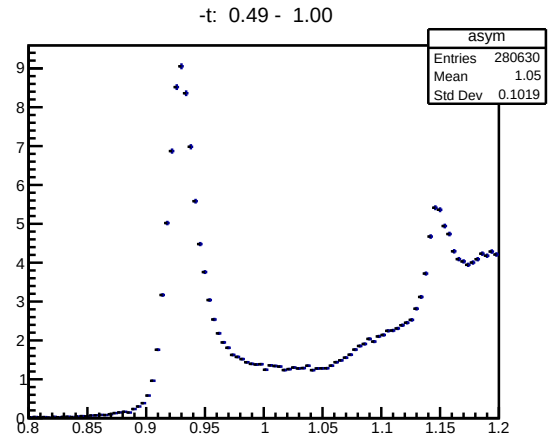
MMpi

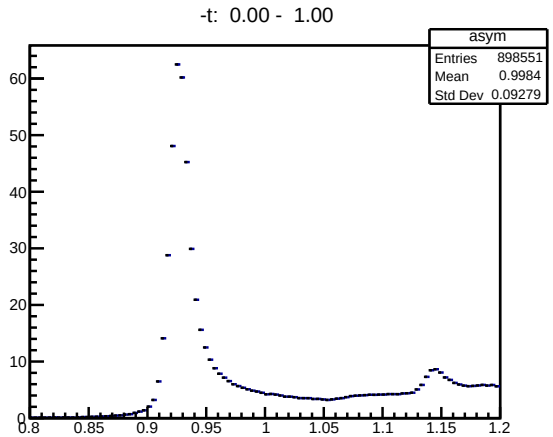

-t: 0.09 - 0.21
asym
Entries 100086
Mean 0.9296
Std Dev 0.02046


-t: 0.21 - 0.29
asym
Entries 149336
Mean 0.9456
Std Dev 0.04168


-t: 0.29 - 0.37
asym
Entries 157271
Mean 0.9741
Std Dev 0.07169


-t: 0.37 - 0.49
asym
Entries 212131
Mean 1.011
Std Dev 0.09327


-t: 0.49 - 1.00
asym
Entries 280630
Mean 1.05
Std Dev 0.1019


-t: 0.00 - 1.00
asym
Entries 898551
Mean 0.9984
Std Dev 0.09279