

LHRS Analysis for d_2^n

Data Modeling Update

D. Flay

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Outline

- 1 Data Modeling with QFS
 - Tweaking the Model
 - Results (So Far)
- 2 Summary

Tweaking the Model

- Introduce an E_s and θ dependence in the DIS region:

$$\sigma_{\text{tot}} = p_{\text{q.e.}}\sigma_{\text{q.e.}} + p_{\Delta}\sigma_{\Delta} + p_{2\text{N}}\sigma_{2\text{N}} + p_{\text{R1}}\sigma_{\text{R1}} + p_{\text{R2}}\sigma_{\text{R2}} \\ + p_{E_s}p_{\theta}p_{\text{DIS}}\sigma_{\text{DIS}}$$

$$p_{\theta} = 1 - 0.12x^2$$

$$p_{E_s} = 1 - 1.5y^2$$

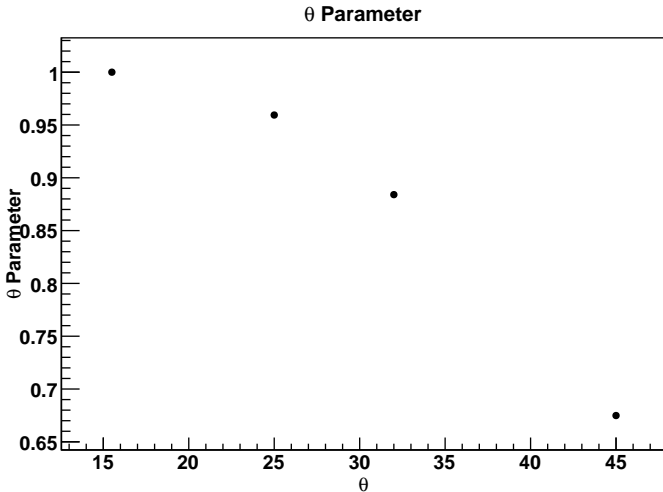
$$x = \frac{\sin(\theta_0) - \sin(\theta)}{\sin(\theta_0)}$$

$$y = \frac{E_s - E_0}{E_0}$$

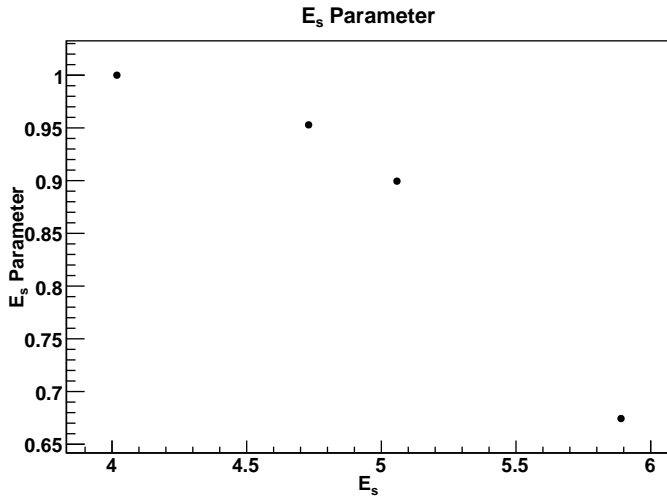
$$\theta_0 = 15.5^\circ$$

$$E_0 = 4.018 \text{ GeV}$$

The θ Parameter

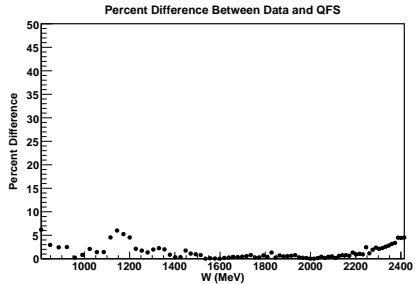
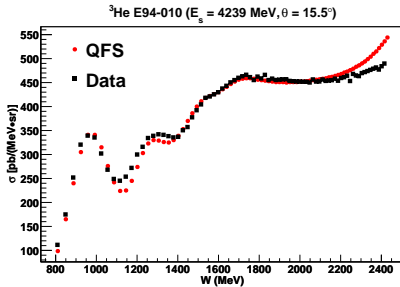


The E_s Parameter



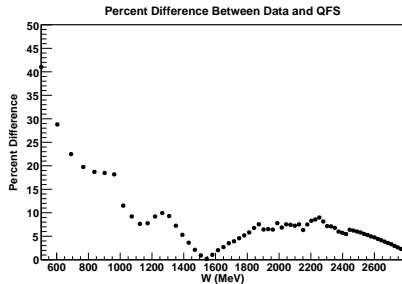
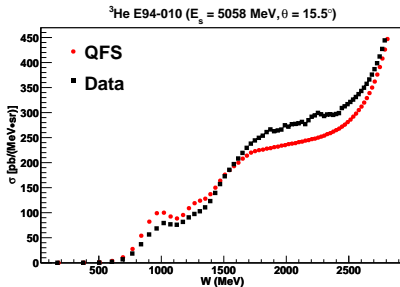
Results (1)

E94-010: $E_s = 4239$ MeV, $\theta = 15.5^\circ$



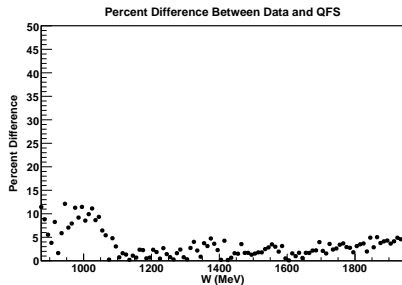
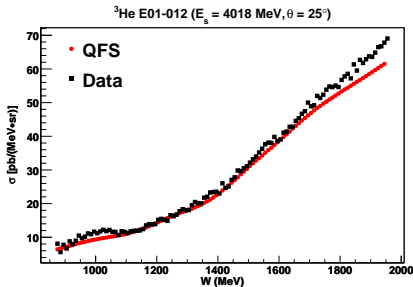
Results (2)

E94-010: $E_s = 5058$ MeV, $\theta = 15.5^\circ$



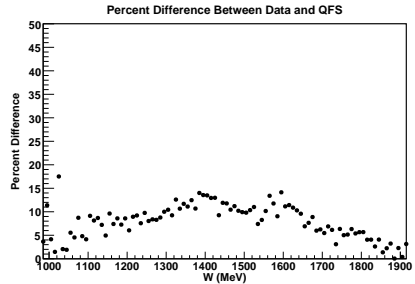
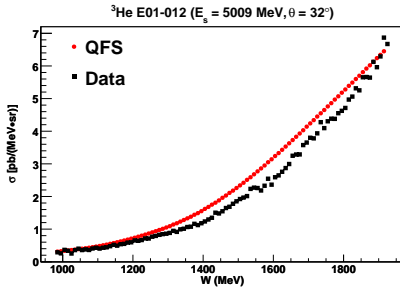
Results (3)

E01-012: $E_s = 4018$ MeV, $\theta = 25^\circ$



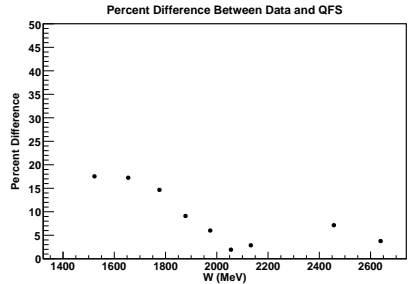
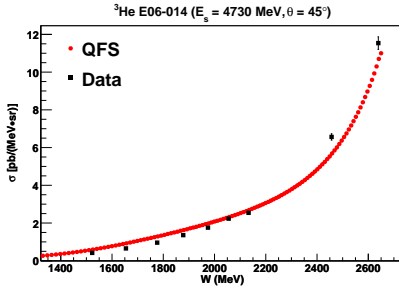
Results (4)

E01-012: $E_s = 5009$ MeV, $\theta = 32^\circ$



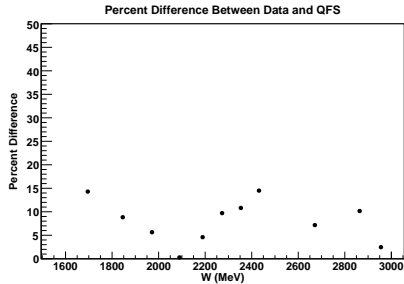
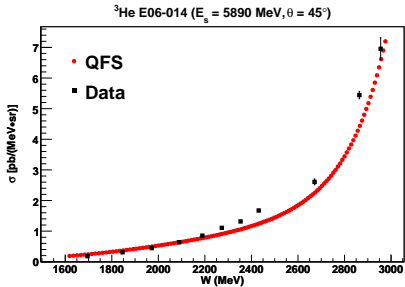
Results (5)

E06-014: $E_s = 4730$ MeV, $\theta = 45^\circ$



Results (6)

E06-014: $E_s = 5890$ MeV, $\theta = 45^\circ$



Summary

- Data Modeling
 - E_s and θ parameters improve the model in the DIS region for most data sets
 - E_s parameter introduces disagreement in Karl's DIS data ($\sim 10\%$)

What's Next?

- Data Modeling
 - Continue to tweak the model to agree better with the data (need a Q.E. parameter. . .)
- Radiative Corrections
 - Need to figure out the issues in the E_s and E_p integrals in QFS and radcor
- Cross Sections
 - e^+ modeling: Wiser code
 - Systematic errors on LT and VDC