LHRS Analysis for d_2^n

Updated ^{3}He Born Cross Sections and Fits, ^{12}C Raw Cross Section

D. Flay

5/17/12

Outline

^{3}He Born Cross Sections (1)

Updated Results: A Correction

- Back on 11/22/11, I gave an update on the e^+/e^- ratios, due to an error with the prescale variable in the cross section code
- Results I showed on 5/3/12 were using the data set before that correction (affects the e^+ data and subsequently σ_{exp})

^{3}He Born Cross Sections (2)

Updated Results: E_s = 4730 MeV Data

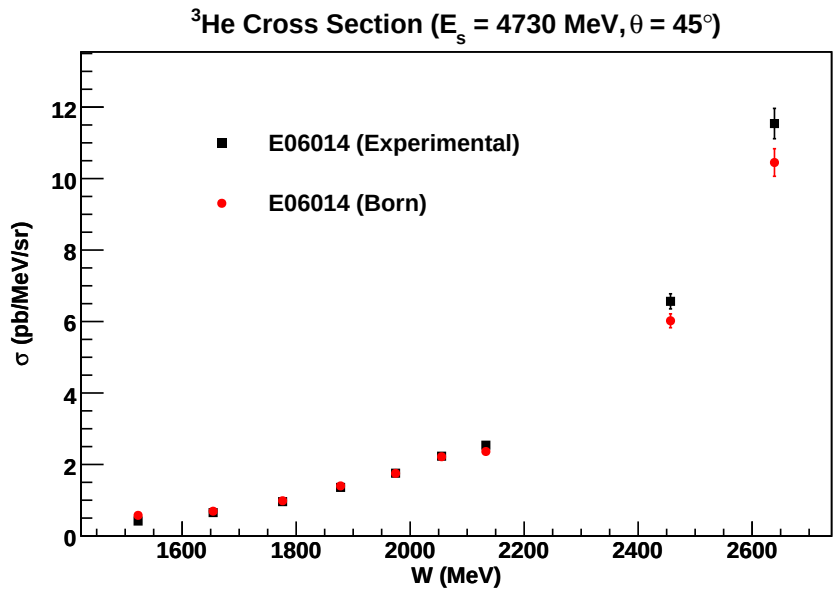


Figure: 9/20/11 data set with incorrect prescales.

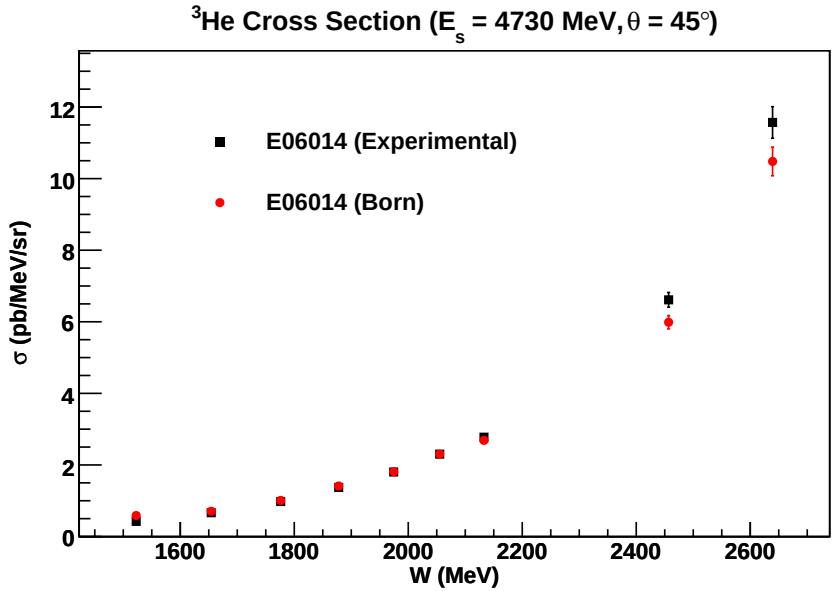


Figure: 11/14/11 data set with correct prescales.

^{3}He Born Cross Sections (3)

Updated Results: E_s = 5890 MeV Data

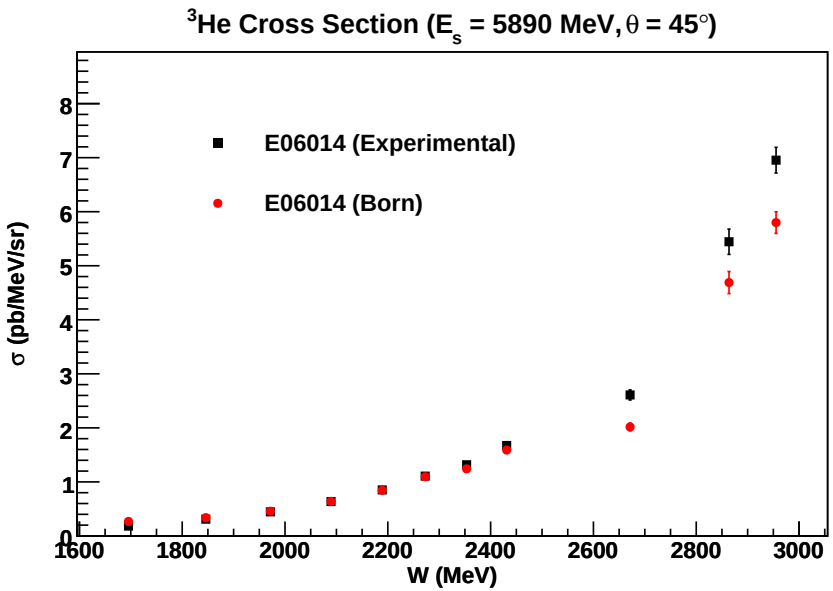


Figure: 9/20/11 data set with incorrect prescales.

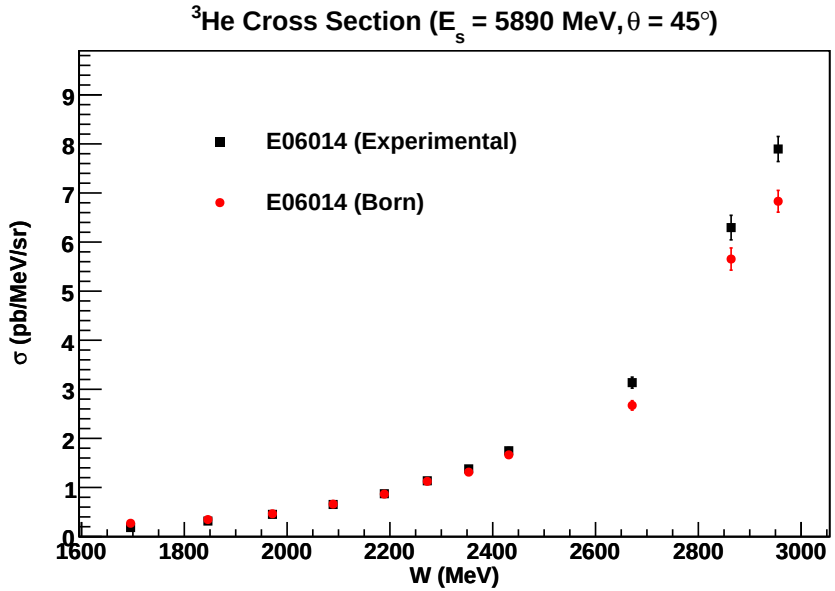
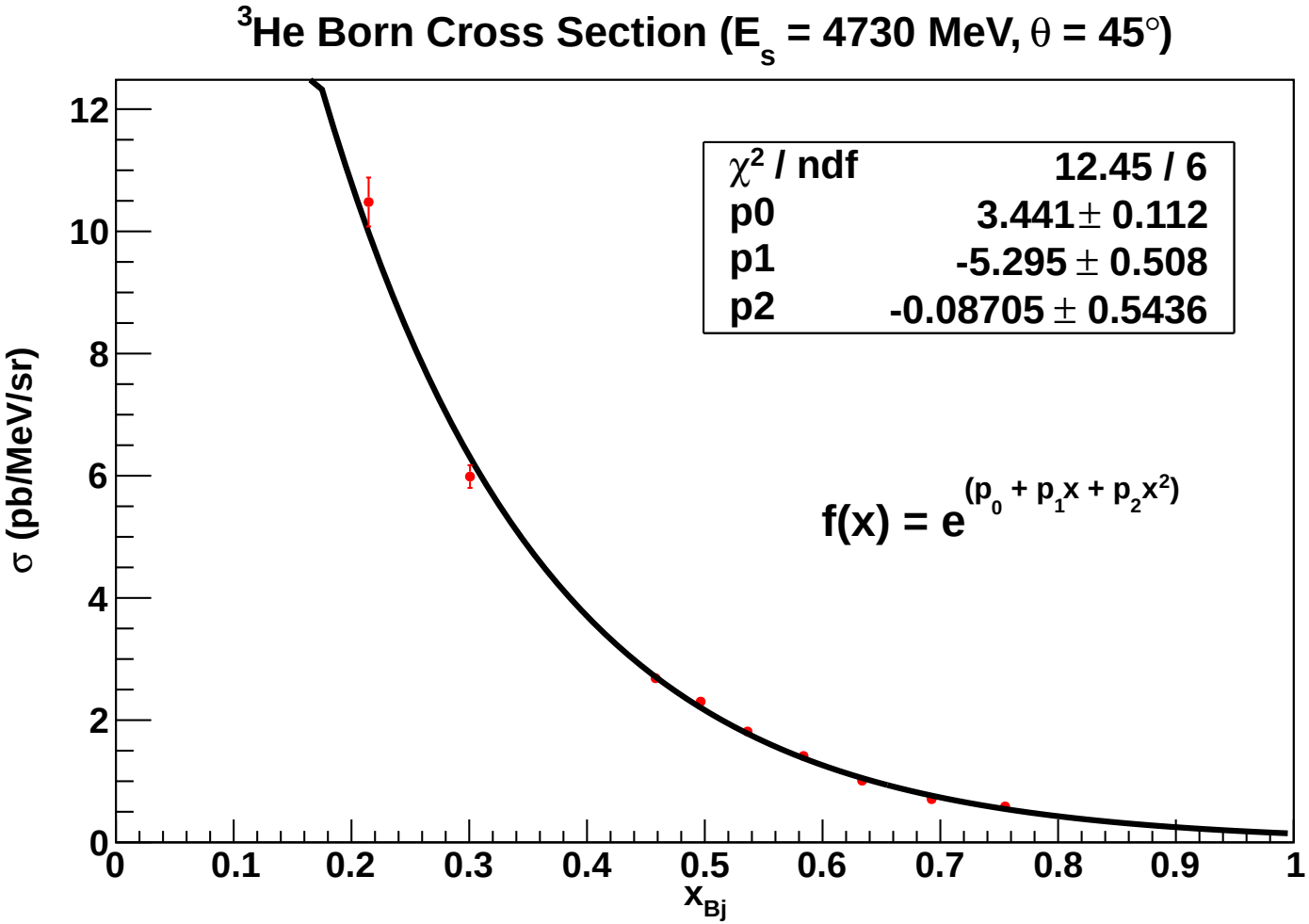


Figure: 11/14/11 data set with correct prescales.

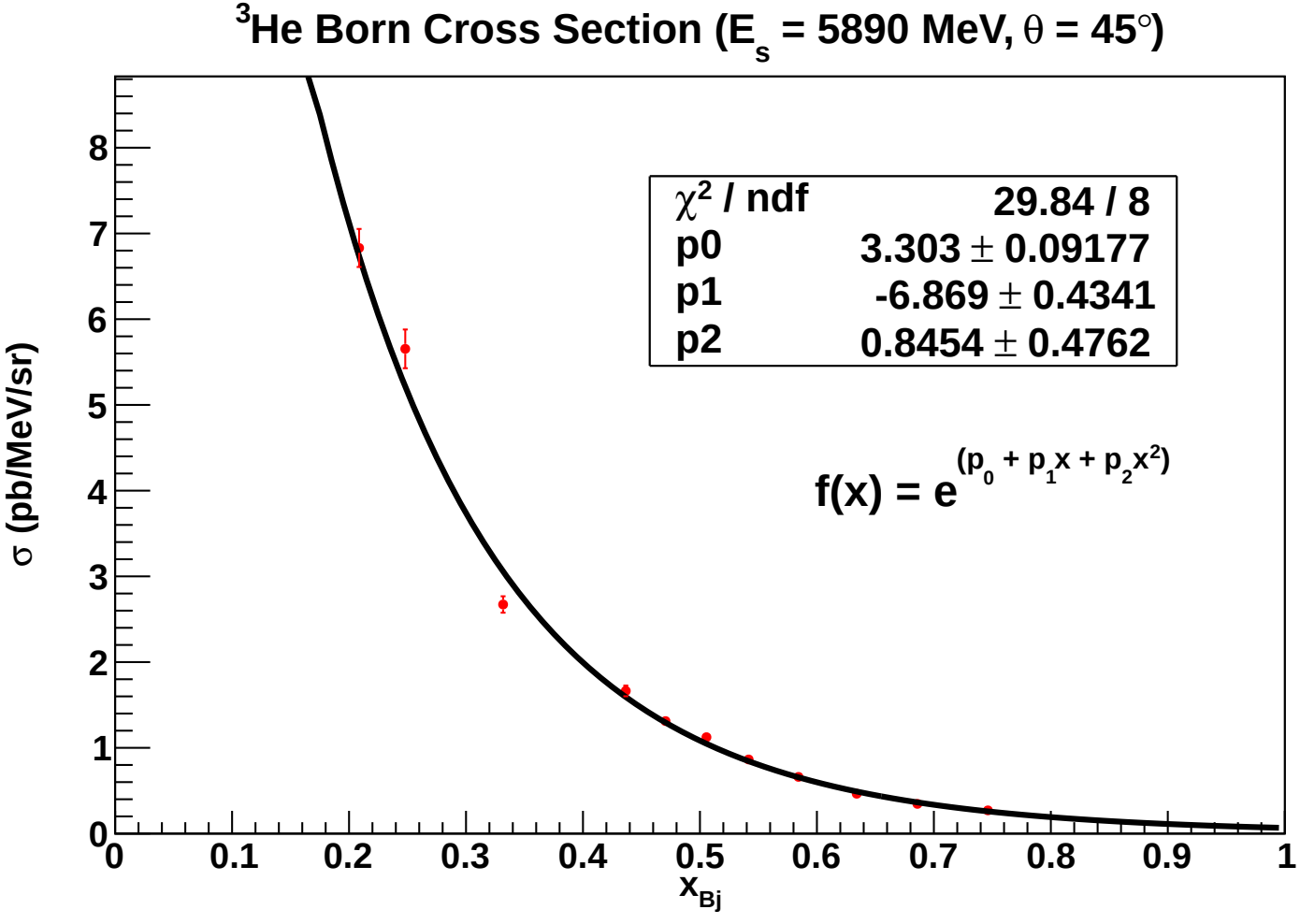
^{3}He Born Cross Sections (4)

Born Cross Section Fit: E_s = 4730 MeV Data



^{3}He Born Cross Sections (5)

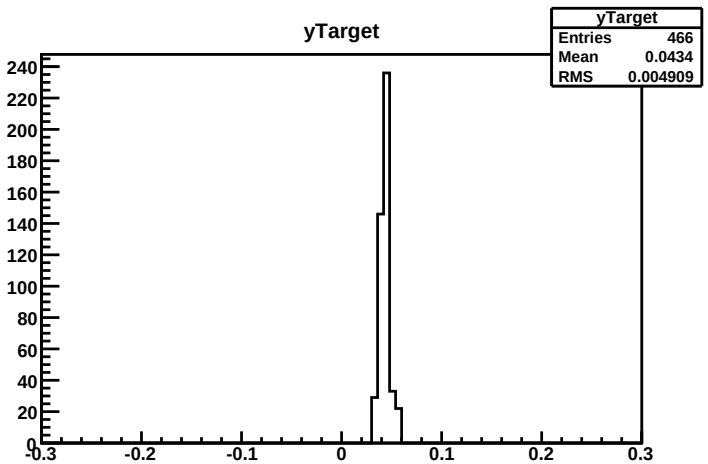
Born Cross Section Fit: E_s = 5890 MeV Data

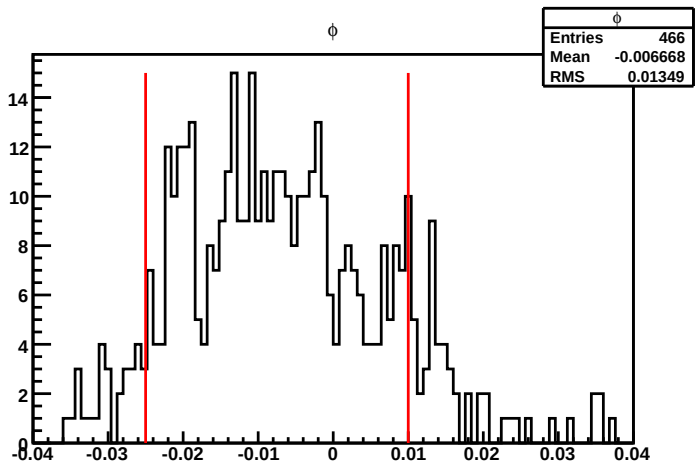


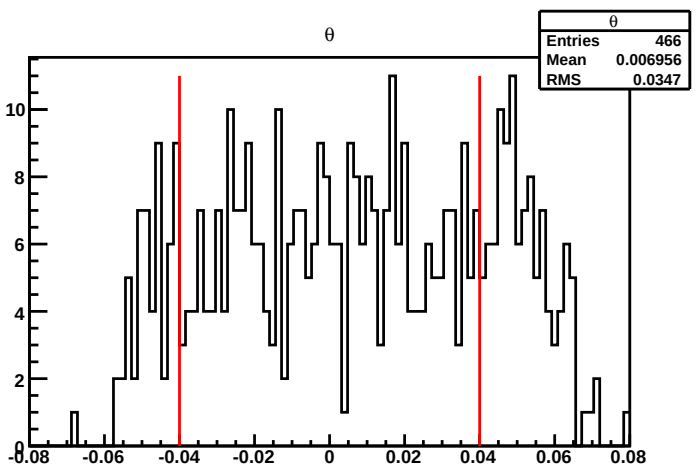
^{12}C Raw Cross Section (1)

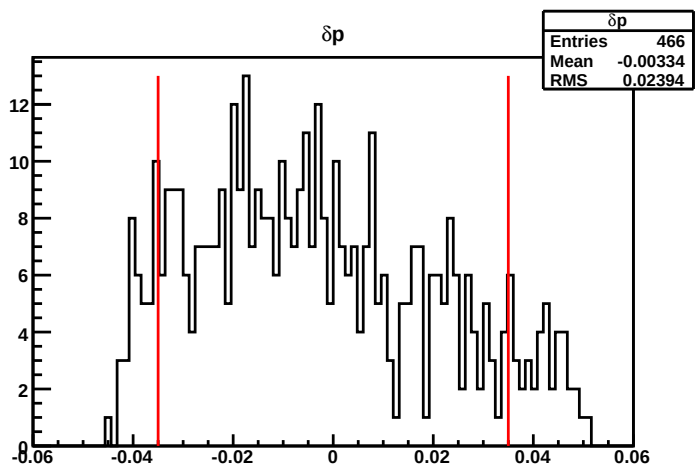
Upstream Foil Cuts

- We need unique cuts for each foil in the y_{tg} and ϕ_{tg} variables (example run 20076)



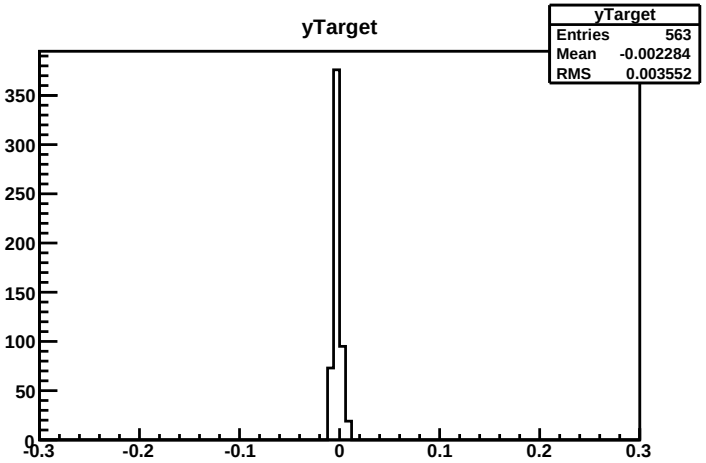


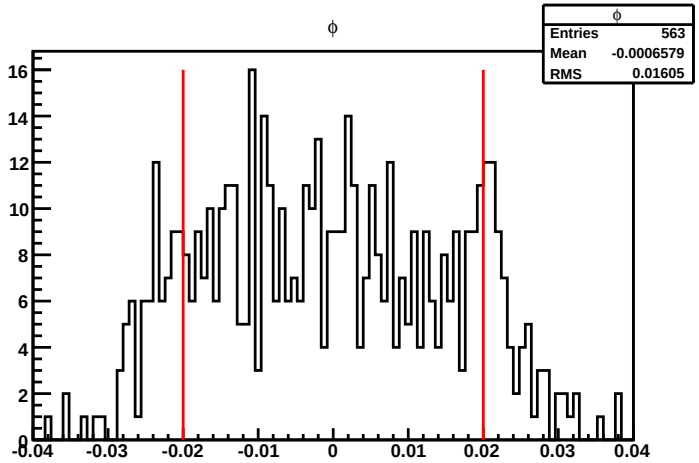


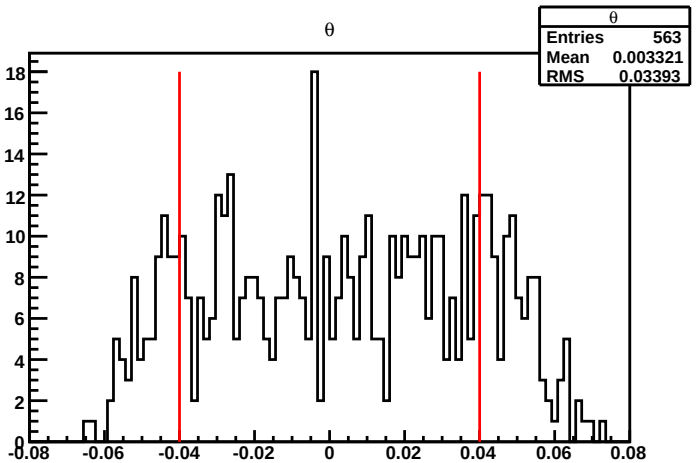


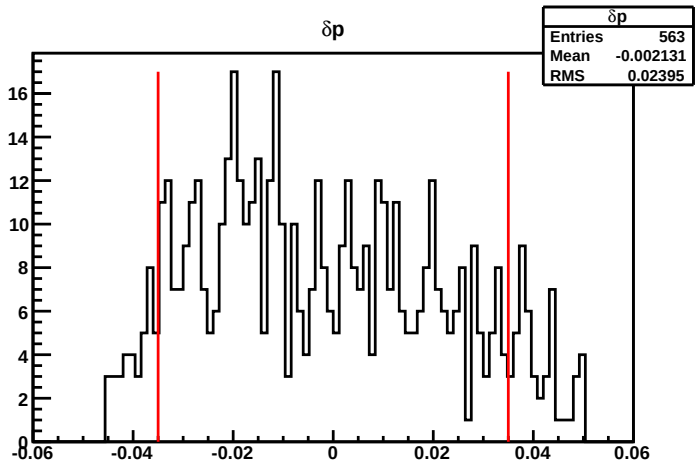
^{12}C Raw Cross Section (2)

Middle Foil Cuts



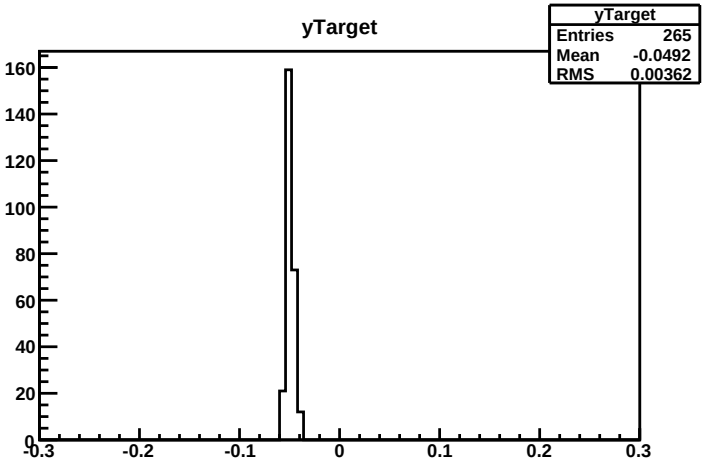


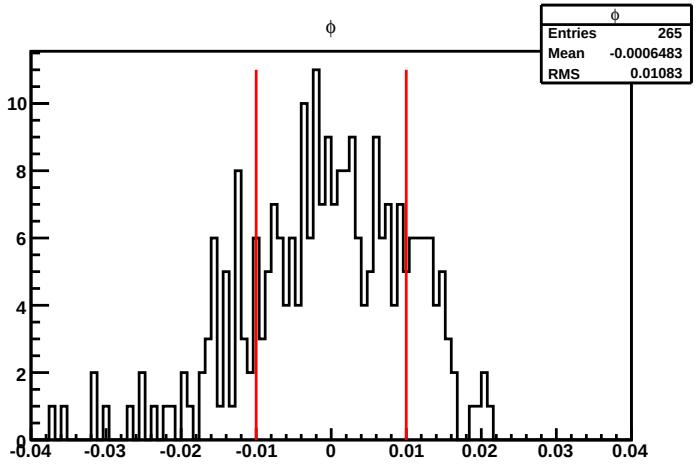


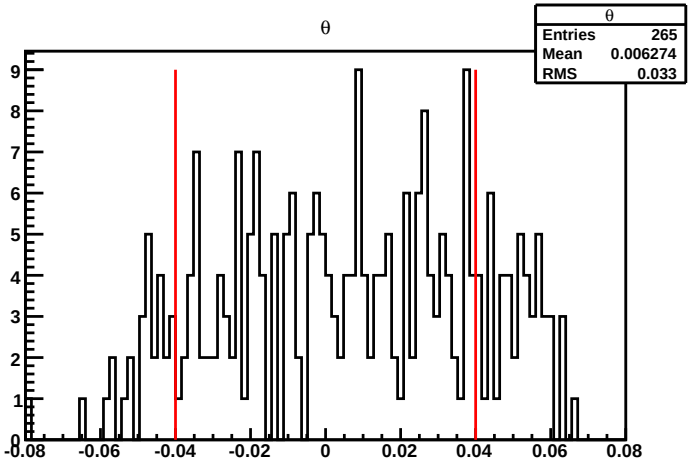


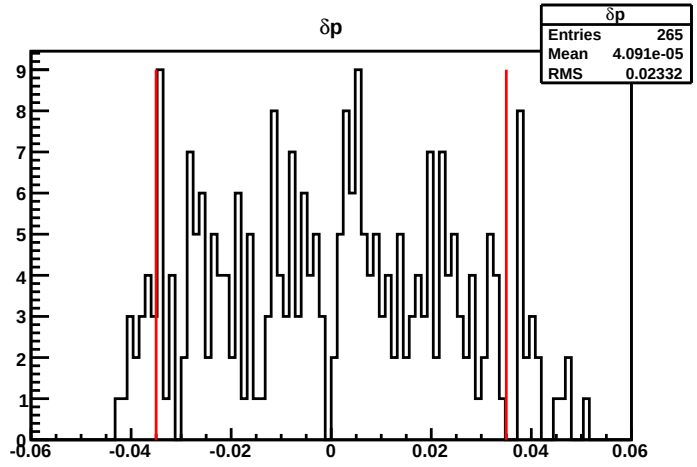
^{12}C Raw Cross Section (3)

Downstream Foil Cuts



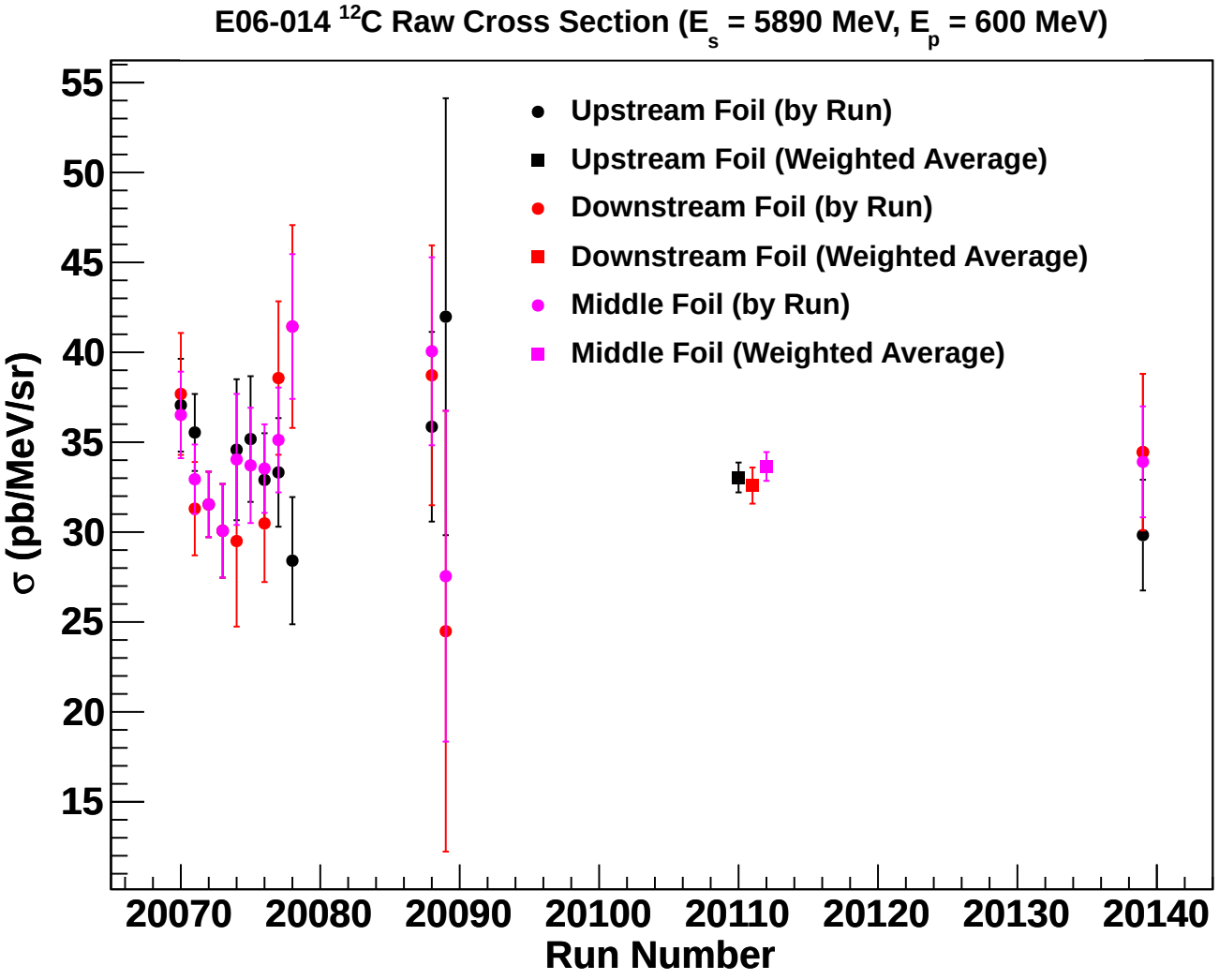






^{12}C Raw Cross Section (4)

E_s = 5.89 GeV Results



Summary

- Updated ^{3}He Born cross sections show a smoother dependence on W and x at 5-pass
- Fits to Born cross sections as a function of x are pretty good
  - For interpolation between data points when calculating g_1,g_2, etc.
- ^{12}C raw cross section is consistent for each foil
  - Still need to find world data to compare to!

What's Next?

- Systematic error of Born cross section fit
- Magnetic flux calculation for the water (and ^{3}He) cell
- Geant4 BigBite simulation
  - Start looking at bend-up and bend-down acceptances, E/p