Summary

Argon Analysis Workshop at VT, Sep 2017

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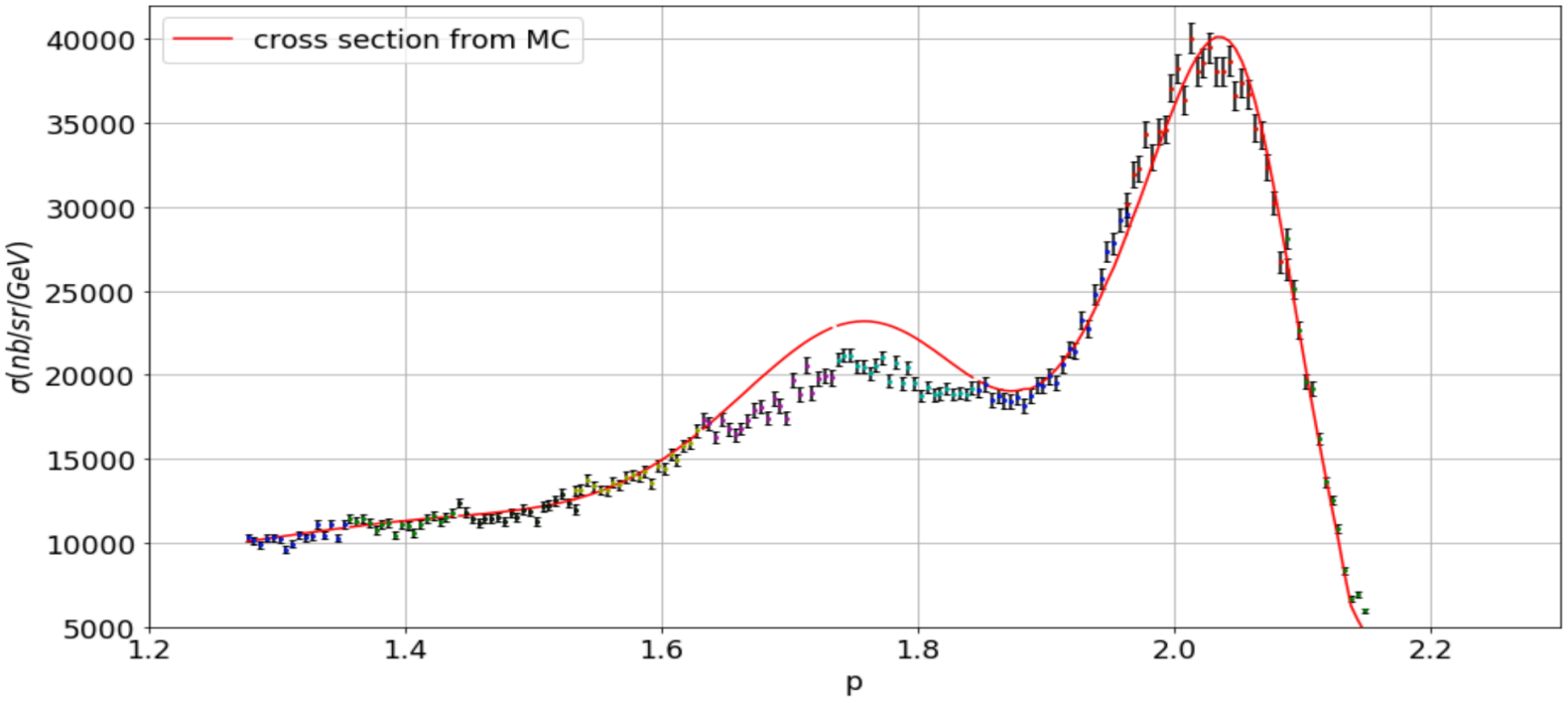
Where are we on $^{12}C(e,e')$?

We are close to finalizing our $^{12}C(e,e')$ cross section



What is left to do on ^{12}C(e,e')? – Just last few knobs to tune!

- Hongxia compiled an exhaustive list of all the pieces of the analysis (check Hongxia's slides for details). Below is the summary of the status of each piece:

- **Beam Energy:** There was confusion over the correct beam energy, after seeing a discrepancy on HALOG (end of run) entry. Doug's suggestion - rescale Teffenbach energy (HallA p) with factor 1.0018 (determined with the ARC energy method and validated with spin precession, check Doug's Talk for more details). Systematic uncertainty on the new energy is 5E-4.

- **Beam Charge:** Revisit this! Suggestion: check with Natalie's recent work on this. Associate flat 1% systematics error, ignore statistical error.

- **Live Time:** All good! Especially fancy Wilson Score Interval! ☺

- **Trigger Efficiency:** All good! (Though, Dien found some discrepancy in the GC efficiency.)

- **VDC one-track efficiency:** Problem with the definition of total number of sample events, it only includes events with non-zero track. Suggestions: Remove acceptance cut, check different region of theta -> calculate efficiency.

- **Cerenkov cut efficiency:** All good! (Though, never ending academic question to students, why cut on 500? ☺)

- **Calorimeter cut efficiency:** All good!

- **Total statistical error ≈ (around) 1.9 %** *[statistical error from the number of scattered electrons in each bin is not included yet]*

- **Simulation results:** Good! Open suggestions: May be run MC with more events. Run 740, 747 (Data < MC): Mystery still remains.

- **Cross section plot:** Shape and size more or less as expected! Problem with u-shape on the edges of each run - due to optics matrix - new optics matrix expected to be available within a week.

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- Hongxia compiled an exhaustive list of all the pieces of the analysis (check Hongxia's slides for details). Below is the summary of the status of each piece:

- **Systematic errors:**

  - **Acceptance cuts:** Looks good!
  - **Cerenkov cut efficiency:** Looks good!
  - **Calorimeter cut efficiency:** Looks good!

  They are not independent of each other. Suggestion: cut only on one of them.

  - **Target thickness:**
  - **Beam x offset:**
  - **Beam y offset:**
  - **Spectrometer x offset:**
  - **Spectrometer y offset:**

  Surprisingly high difference for run 755. Suggestion: use more event in MC (and may be try with random seed).

  - **Beam charge:** Looks good!
  - **Raster half-width x,y:**
  - **Beam Energy:**

  Not yet included.

Total systematic error ≈ (around) 3 %

Moving Forward: ^{12}C(e,e') to ^{48}Ti(e,e')

- While we are finalizing/refining ^{12}C(e,e') results – Parallely, we will start analyzing ^{48}Ti(e,e') cross section.

- We should be able to use the same machinery that we developed/used for ^{12}C(e,e'), we don't expect any surprizes (hopefully ☺).