

# Asymmetry Comparison

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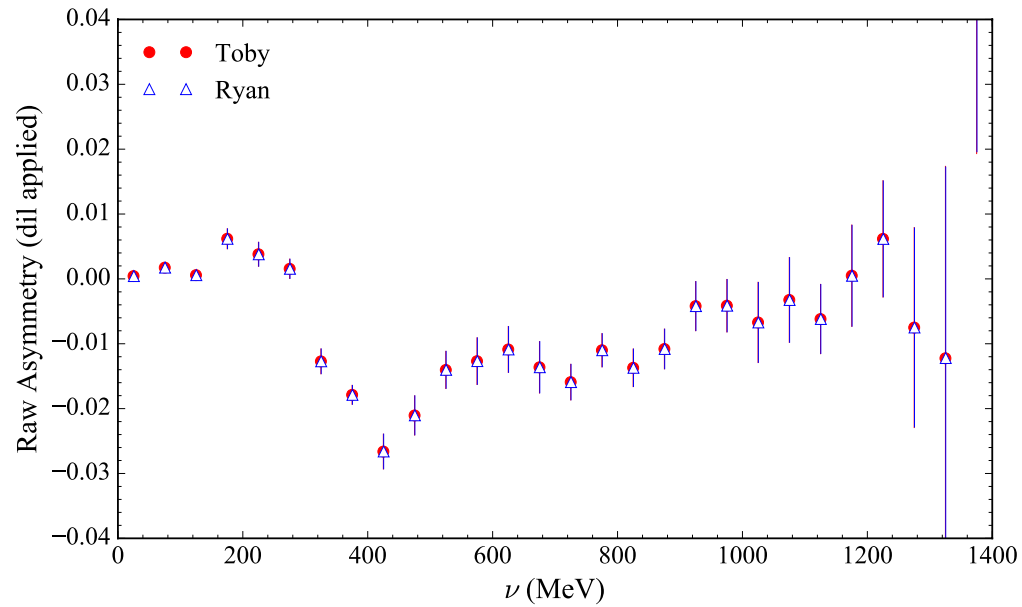
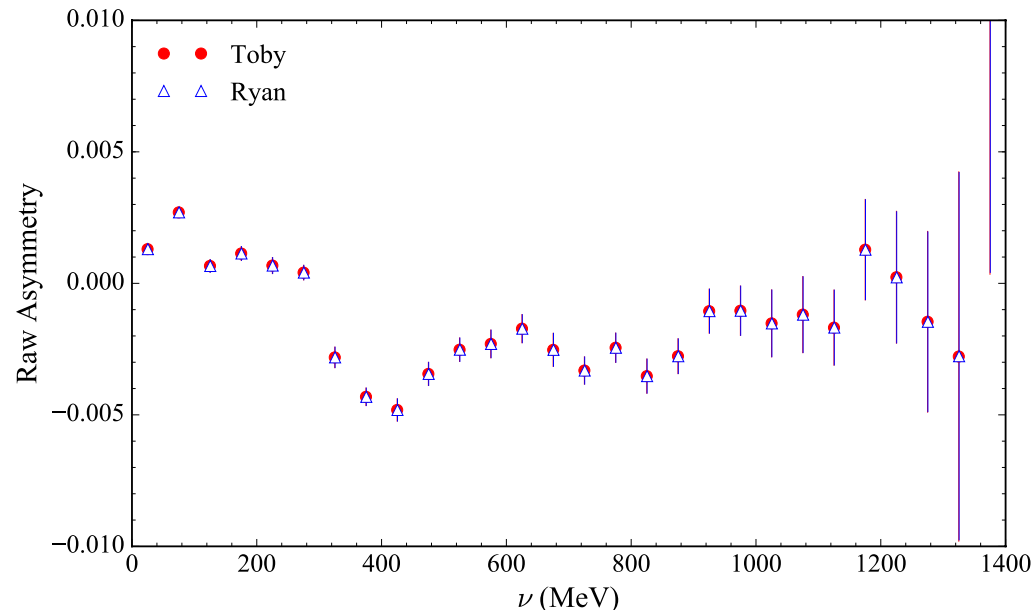
4/26/17

# Overview

- Compare my asymmetry calculations with Toby to make sure we agree
- **Good electron cuts used to generate asymmetries:**
  - Helicity Error:  $hel.(L/R).error \neq 0$
  - BPM Error:  $(L/R)rb.bpmavail == 1$
  - Event type:  $D(L/R).evtypebits \& (1 \ll 3) > 0$
  - VDC Track:  $(L/R).tr.n = 1$  and  $(L/R).vdc.(u1/u2/v1/v2).ncluster = 1$
  - PID cuts from Melissa's analysis and MySQL database
  - DP Cut:  $\pm 4\%$  (  $(L/R).rec.dp$  )
  - Target Phi:  $-0.04 < (L/R).tr.tg\_ph < 0.04$  (TRANS)
  - Target Phi:  $-0.06 < (L/R).tr.tg\_ph < 0.06$  (LONG)
  - Target Theta:  $-0.04 < (L/R).tr.tg\_th < 0.08$
  - Loose Tracking Cuts:  $-0.08 < (L/R).tr.r\_y < 0.08$  and  $-0.8 < (L/R).tr.r\_x < 0.8$
- Use same cuts and same runs to generate asymmetries
- Found a few runs missing efficiency info so that is updated in MySQL
- Updated C++ library to include correct d-type for half-wave plate status
  - Previously casted it as an INT which would miss if HWP switched during run. Happened once at 5T settings

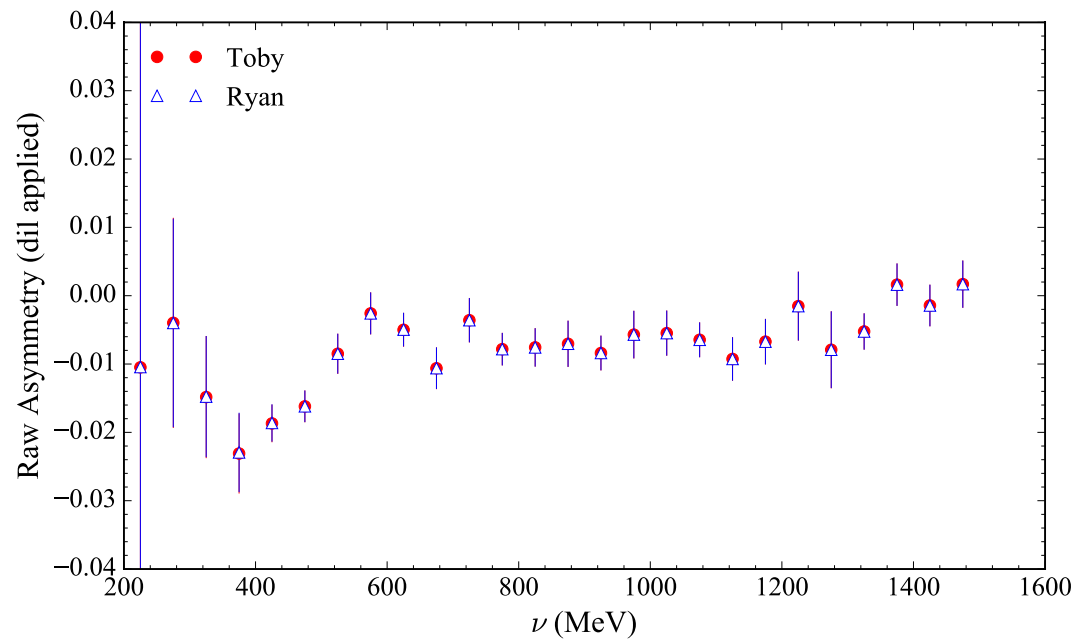
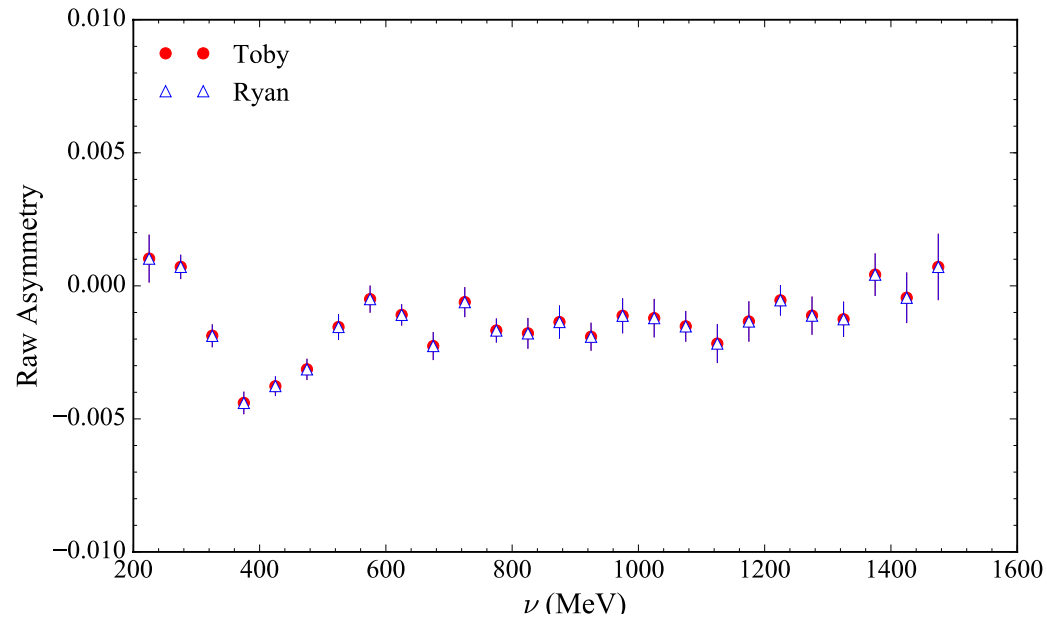
# 2.2 GeV 5T Transverse

50 MeV Binning



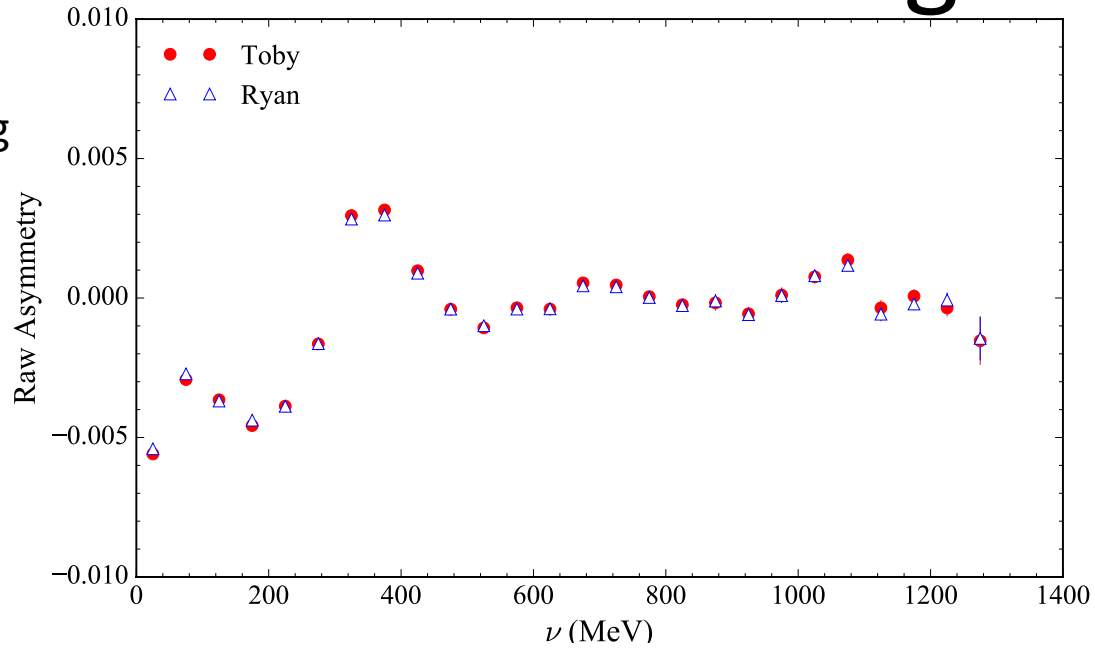
# 3.3 GeV 5T Transverse

50 MeV Binning

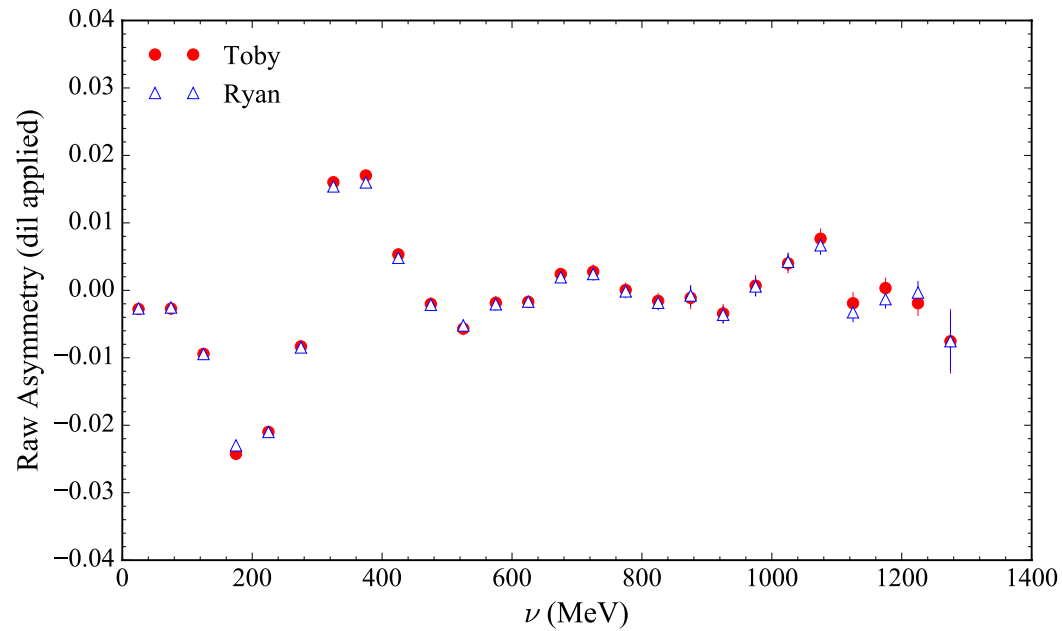


# 2.2 GeV 5T Long.

50 MeV Binning



Small difference here is from using slightly different acceptance cuts in  $\phi$ .



# Angle Fit

- Toby and I's angle fits also agree
- Noticed I was mistakenly cutting out 1 mom. setting at 2.2 GeV 5T Trans.

Use following functional form to fit:  $\theta$  (deg) =  $\exp(p_0 + p_1 * P_0) + p_2 + p_3 * P_0$

$P_0$  in GeV

Use initial parameters for  $p_0, p_1, p_2, p_3$  from Jixie ELOG Post 110: <https://hallaweb.jlab.org/dvcslog/g2p/110>

## FIT PARAMETERS

3.3 GeV 5T Trans:

$P_0 = 2.667, P_1 = -1.723, P_2 = 9.124, P_3 = -0.876$

2.2 GeV 5T Trans:

$P_0 = 3.485, P_1 = -2.113, P_2 = 9.231, P_3 = -0.871$

# Going Forward

- Keep comparing at each step of the analysis
- But so far so good!