

Radiative Corrections on Polarized Cross-Sections

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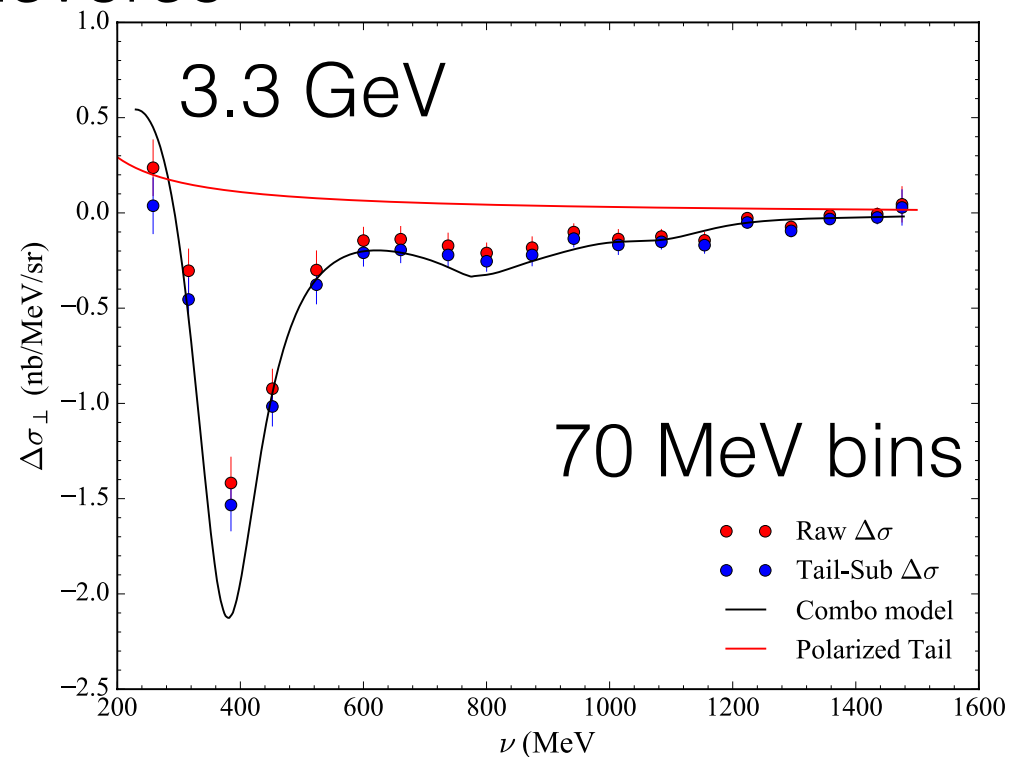
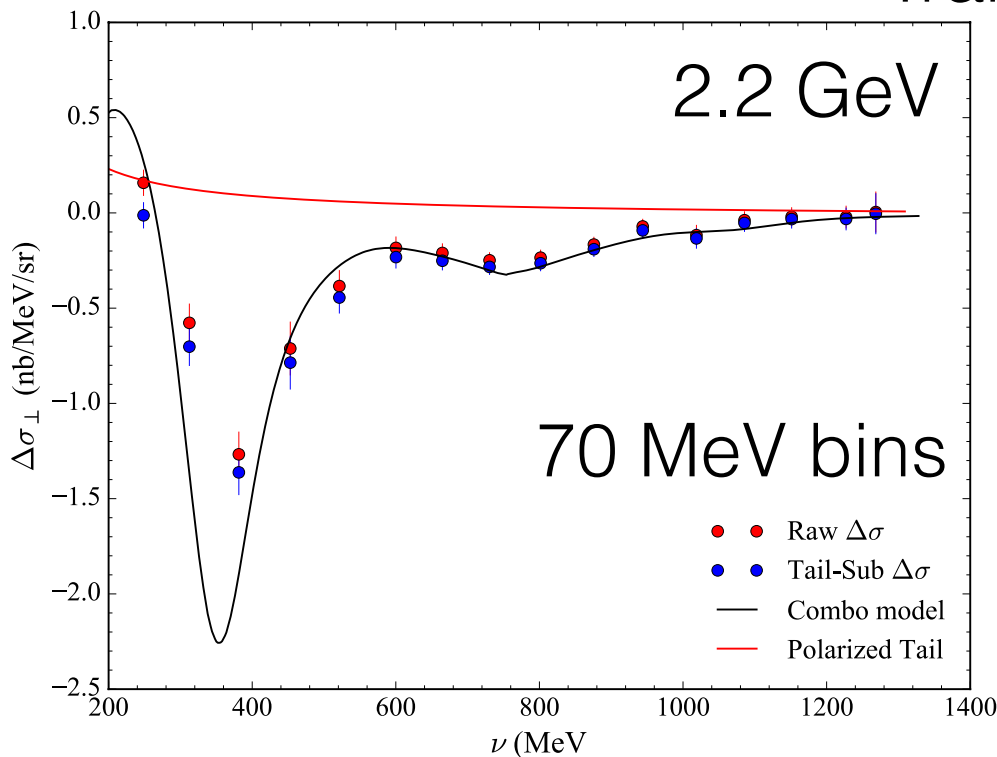
Overview

- Have asymmetries at three settings (both LHRS/RHRS statistics):
 - 2.2 GeV 5T Transverse
 - 2.2 GeV 5T Longitudinal
 - 3.3 GeV 5T Transverse
- Showed previously for long. data that we lack the statistics to make a bin-centering correction
 - Generating unpolarized cross sections using a fit to the scattering angle based upon the central angle of the acceptance cuts I use
 - Scattering angle is weighted by $1/Mott$ when histogram-ed
 - Fully radiated Bosted model including elastic tail
- Also using a model dilution right now, but with updated PF values from Toby's slides
- DOES NOT INCLUDE ANY DISCUSSION OF FORMALISM SYSTEMATIC ERROR YET!

1st Step: Polarized Elastic Tails

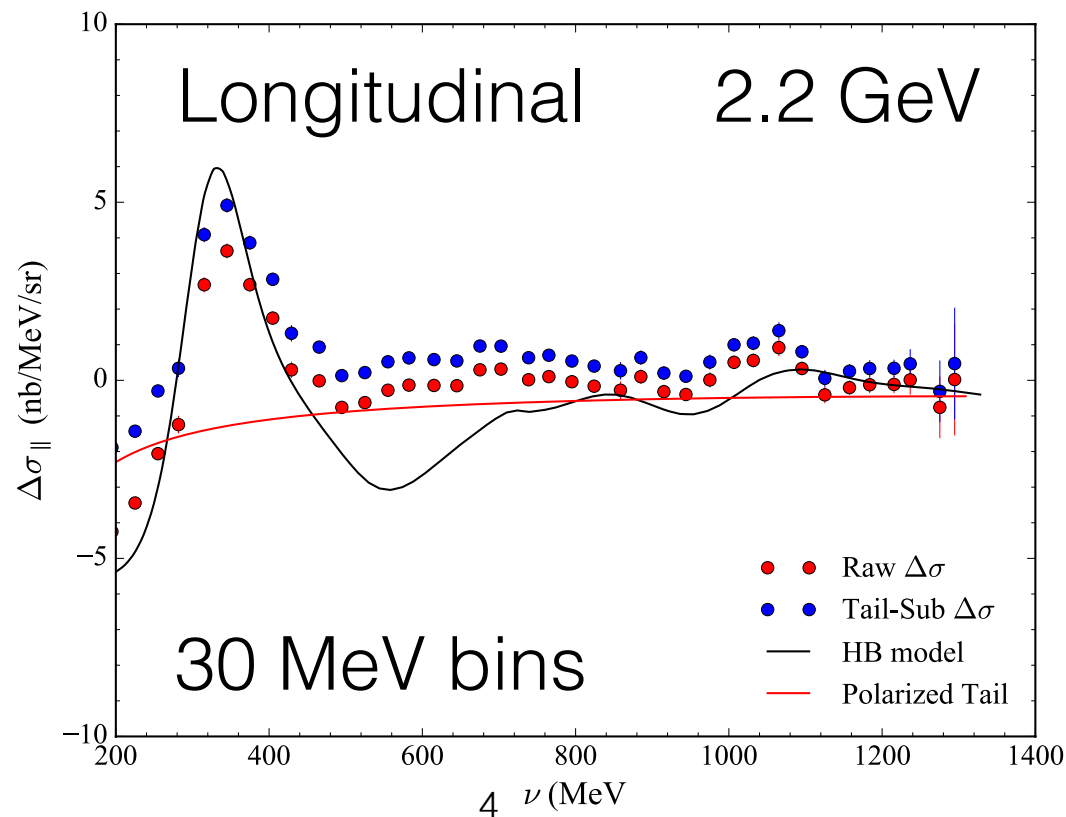
- Run ROSETAIL with polarized options turned on
 - Use rad-length/ ΔE values I previously calculated
 - Use fit to scattering angle from generating unpolarized model

Transverse



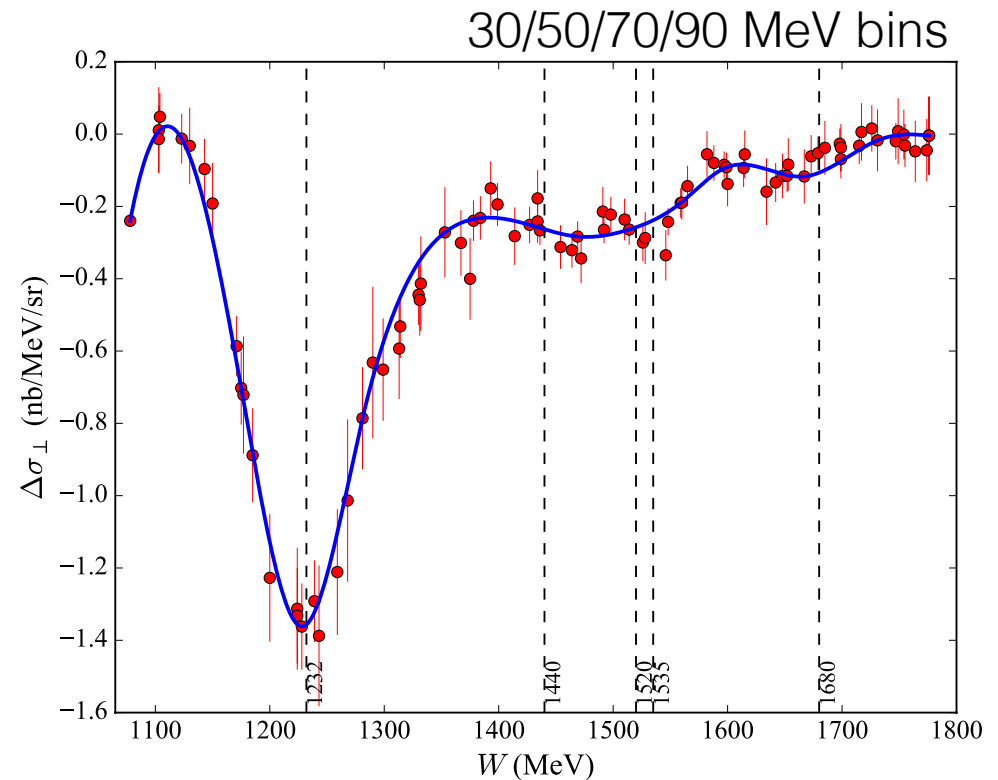
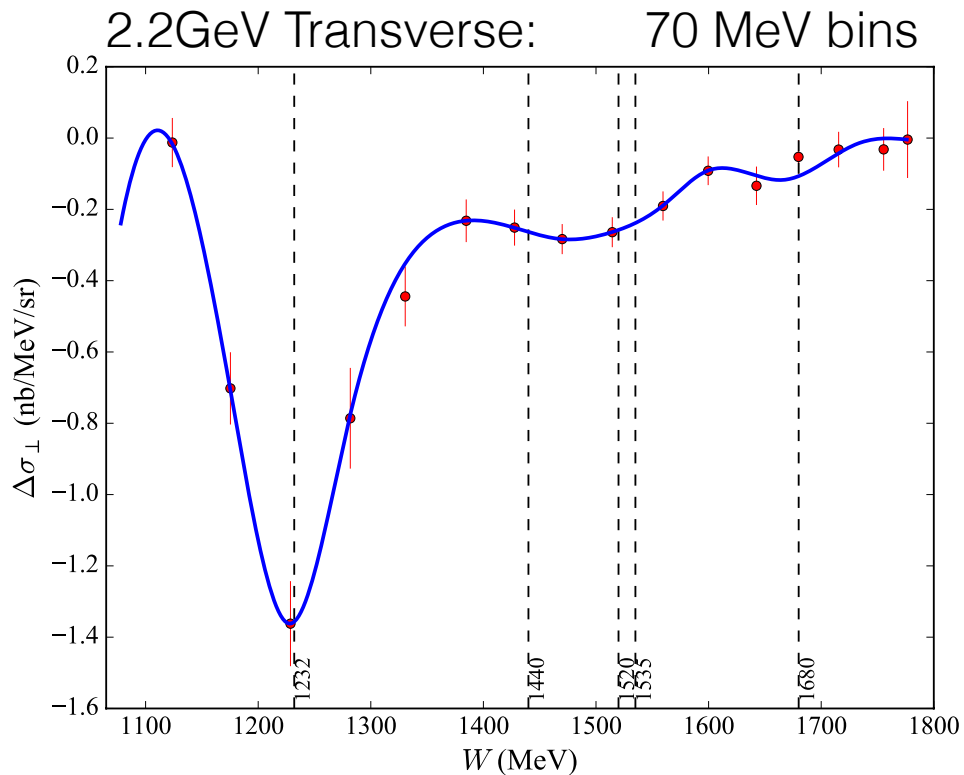
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2nd Step: Smooth Polarized DS

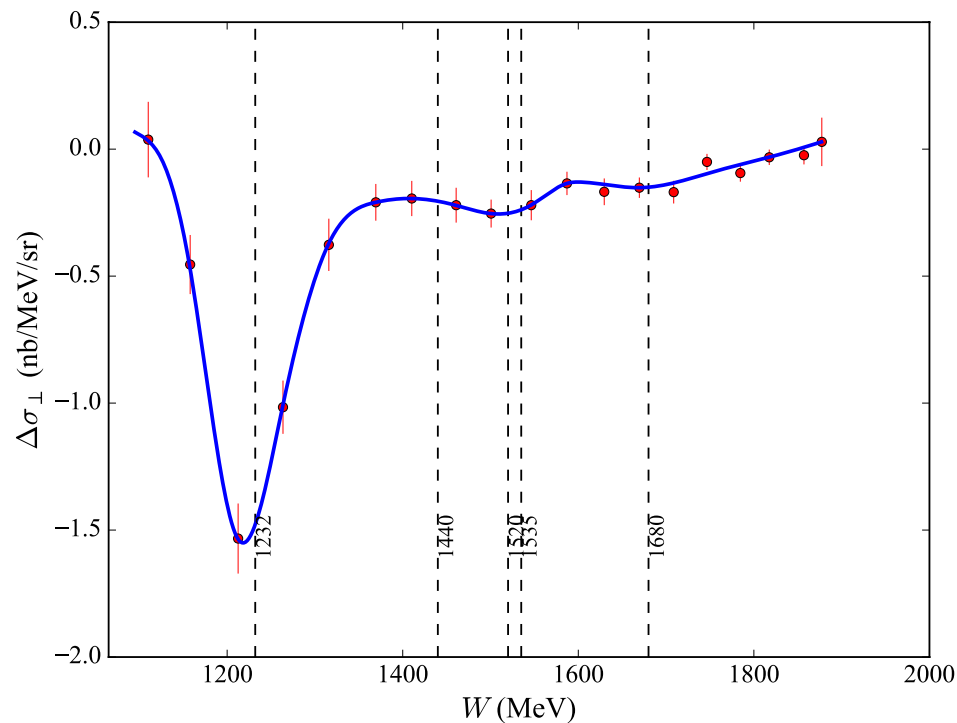
- Need to smooth out statistical fluctuations for input into RADCOR
 - Use interpolation in PYTHON where I choose the points to interpolate
 - Interpolate against W and mark location of resonances to guide
 - Use a super-set of data (combined data-set of 30/50/70/90 MeV bins) to make sure I don't miss absolute peak locations



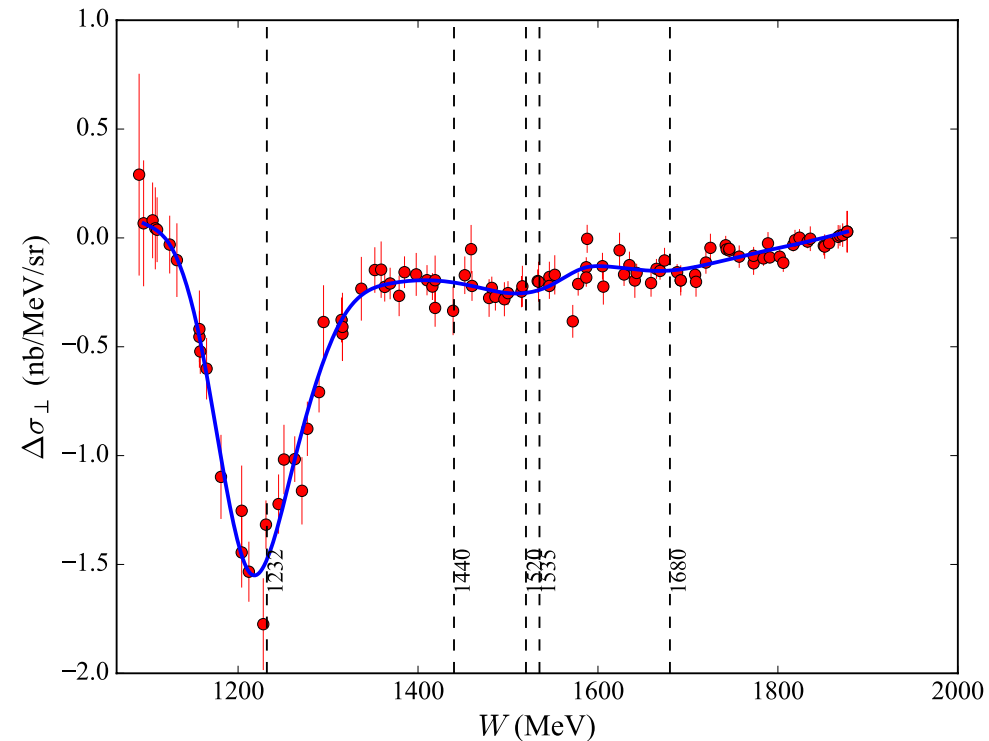
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3.3GeV Transverse: 70 MeV bins



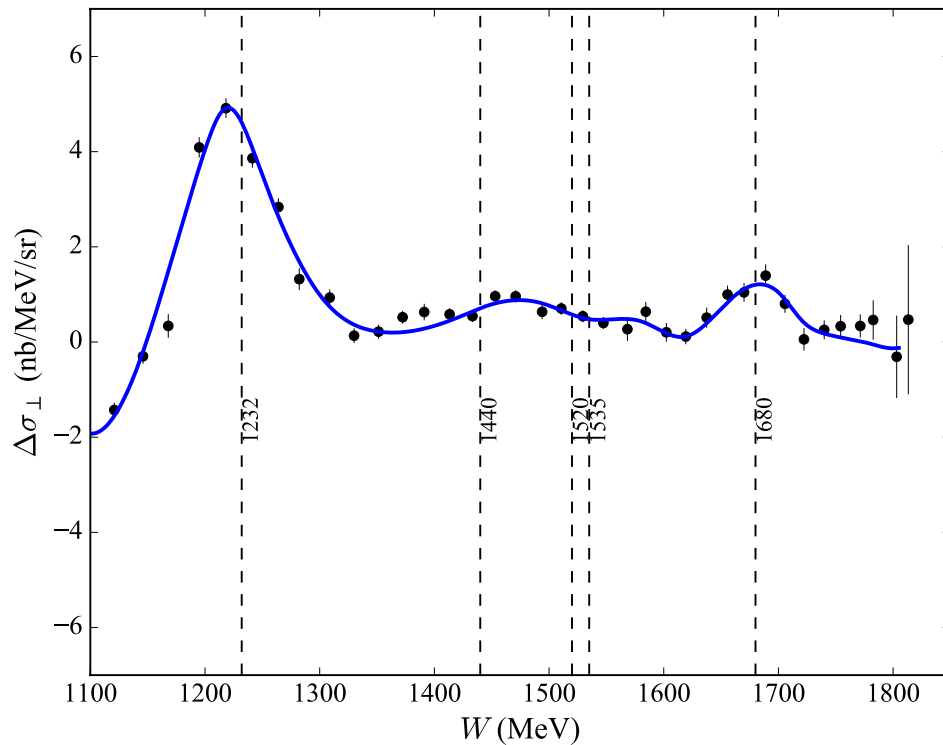
30/50/70/90 MeV bins



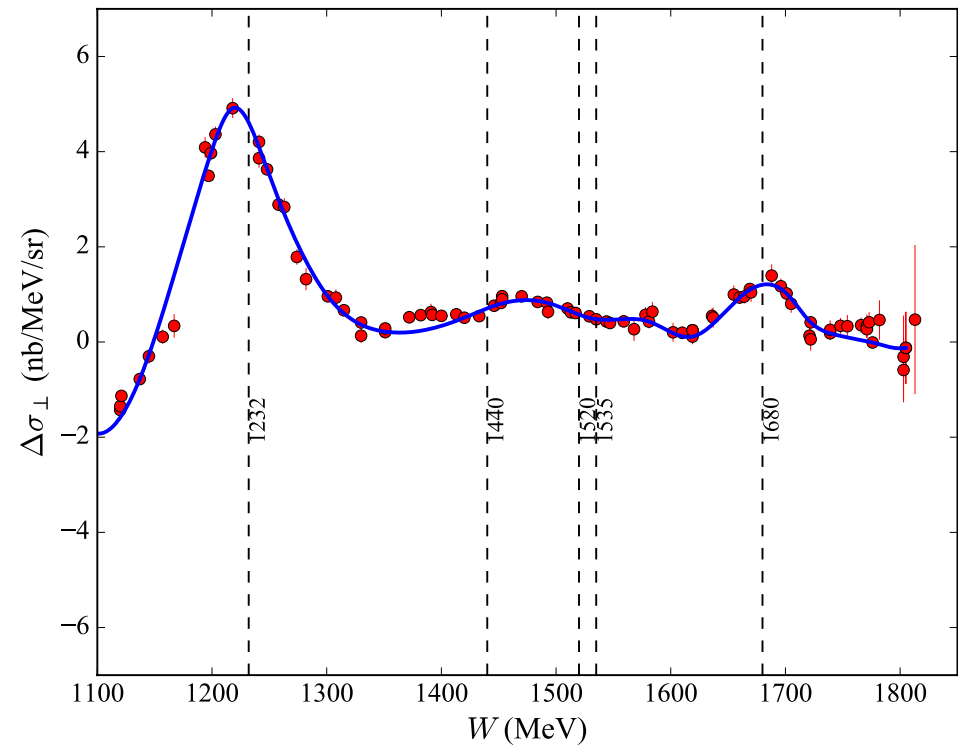
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2.2GeV Longitudinal: 30 MeV bins



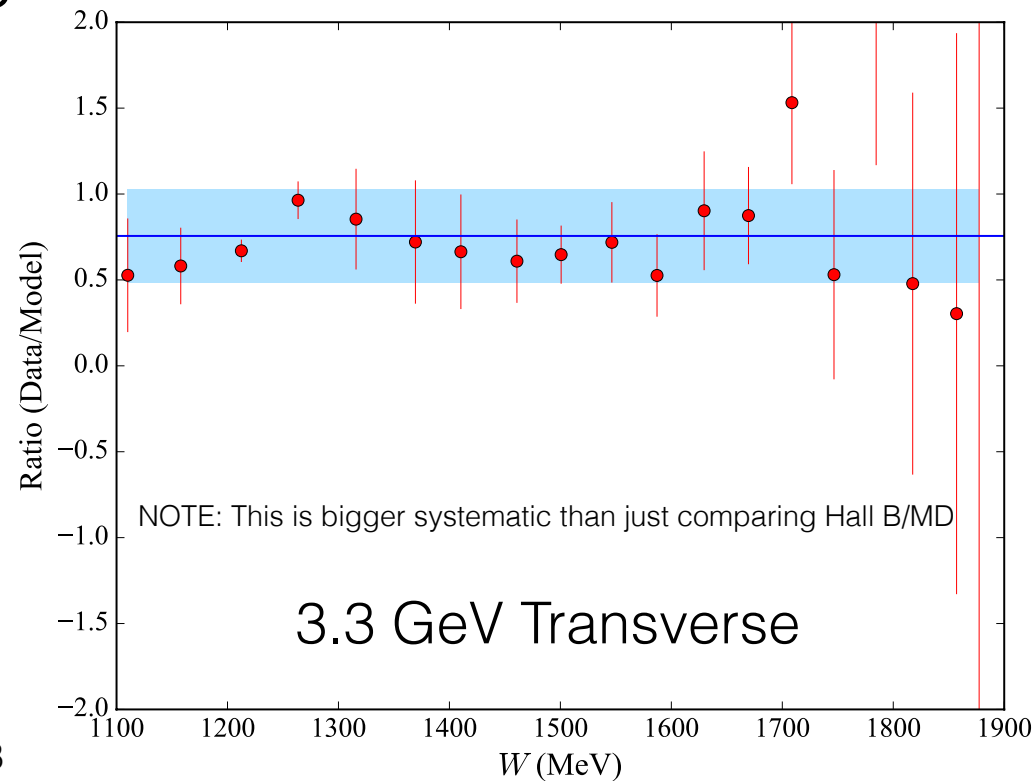
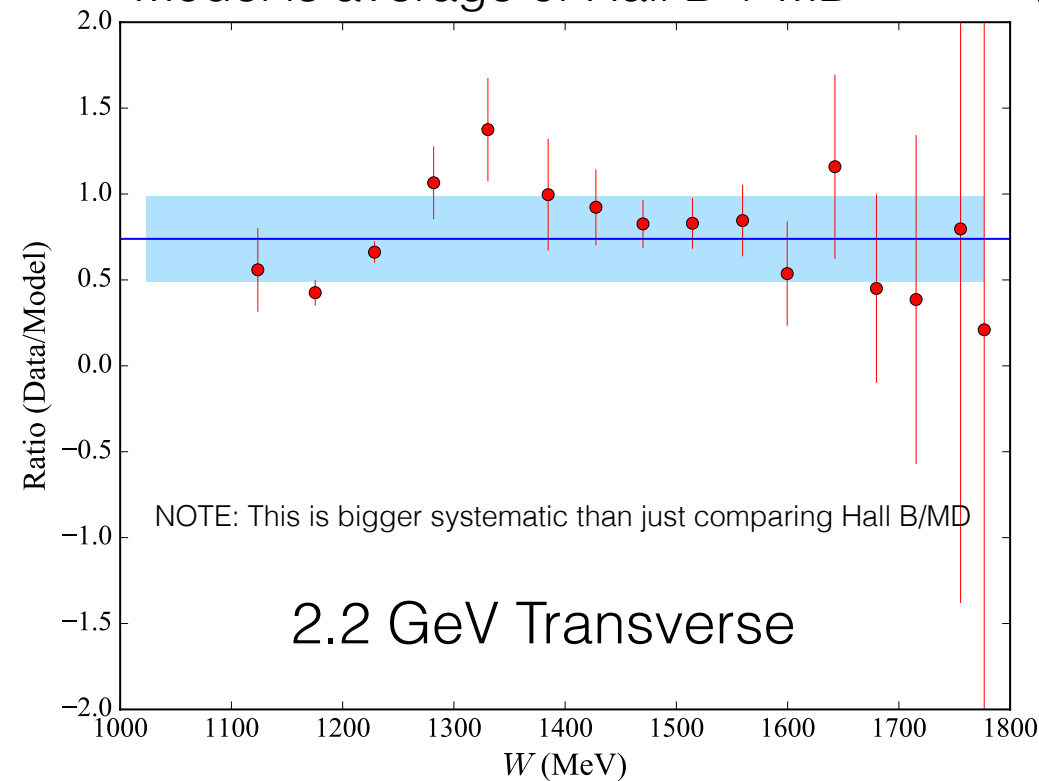
30/50/70/90 MeV bins



3rd Step: Run RADCOR

- For extrapolations in RADCOR use either radiated Hall B/ MAID 2007 models
 - Also can change the overall scale of the models
 - Determine overall scale factor by looking at weighted average of data/model
 - Can check effect of this overall scale factor by looking at standard deviation of the average

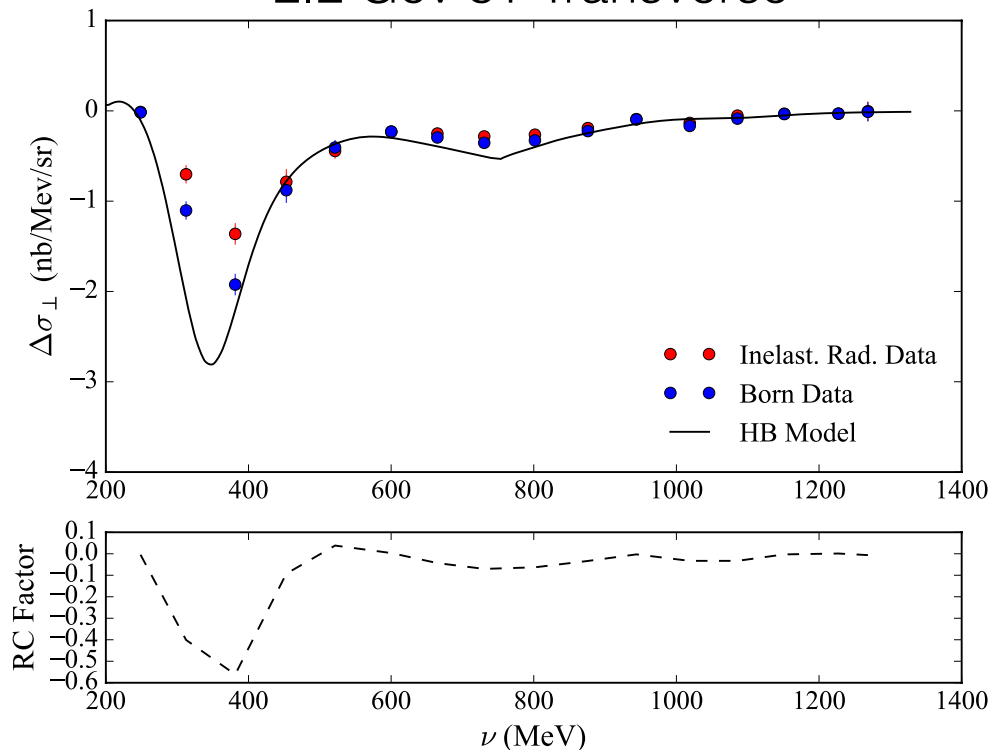
Model is average of Hall B + MD $Avg = 0.75 \pm 0.25$



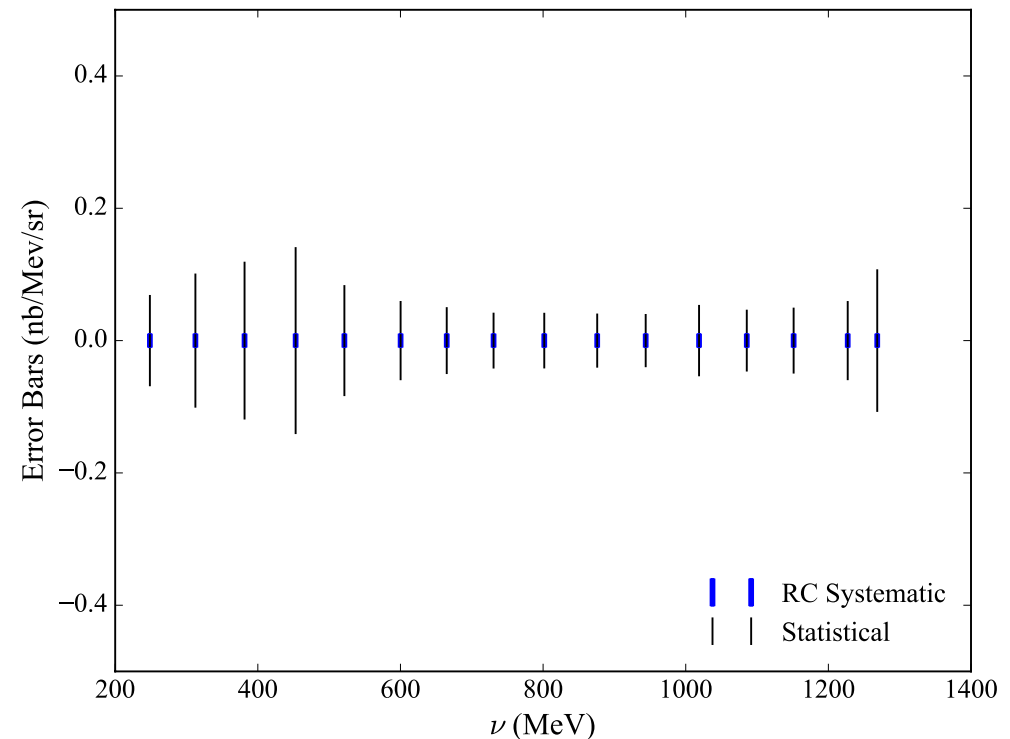
4th Step: Apply RC to Data

- Use difference method between RC'd interpolated spectra to correct data
 - Get an RC spectra from data for each input model scale factor (0.50,0.75 and 1.0)
 - Weighted average of different data results IS RC'd result and use standard deviation to get a handle on systematics
 - Systematics roughly 0.005 nb/MeV/sr across entire spectra (<0.5% error at delta resonance)

2.2 Gev 5T Transverse



Comparison of size of input systematic error and Statistical error bars



Going Forward

- Finish up RADCOR/POLRAD RC's (3.3 GeV trans/ 2.2 GeV long.)
- Systematic error study on inelastic RC procedure finished
- Substitute in real g2p dilution
- Systematic error study of the formalism itself
 - Mostly finished for elastic tail
- Questions? Comments? Concerns?

