E02-013 Analysis Update

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October 28, 2009

This Week

- Putting together writeup
- Analysis
  - Beam polarization analysis
  - False asymmetry analysis
  - $p_{\mathrm{miss},\perp}$ cut dependence
- Monte Carlo
  - Running More Statistics
  - Evaluating statistical/systematic error

Writeup Structure

- Calibrations
  - Neutron Arm Survey
  - Neutron Arm Timing
  - BigBite Survey
  - BigBite Wire Position, T0 Timing
  - BigBite Optics
- Monte Carlo
- Polarizations
  - Target Polarization
  - Beam Polarization
- Corrections
  - Instrumental Asymmetries
  - Accidental Background
  - BigBite Pion
  - Nitrogen Contamination
  - Charge Identification
  - Inelastic Events
  - Final State Interactions

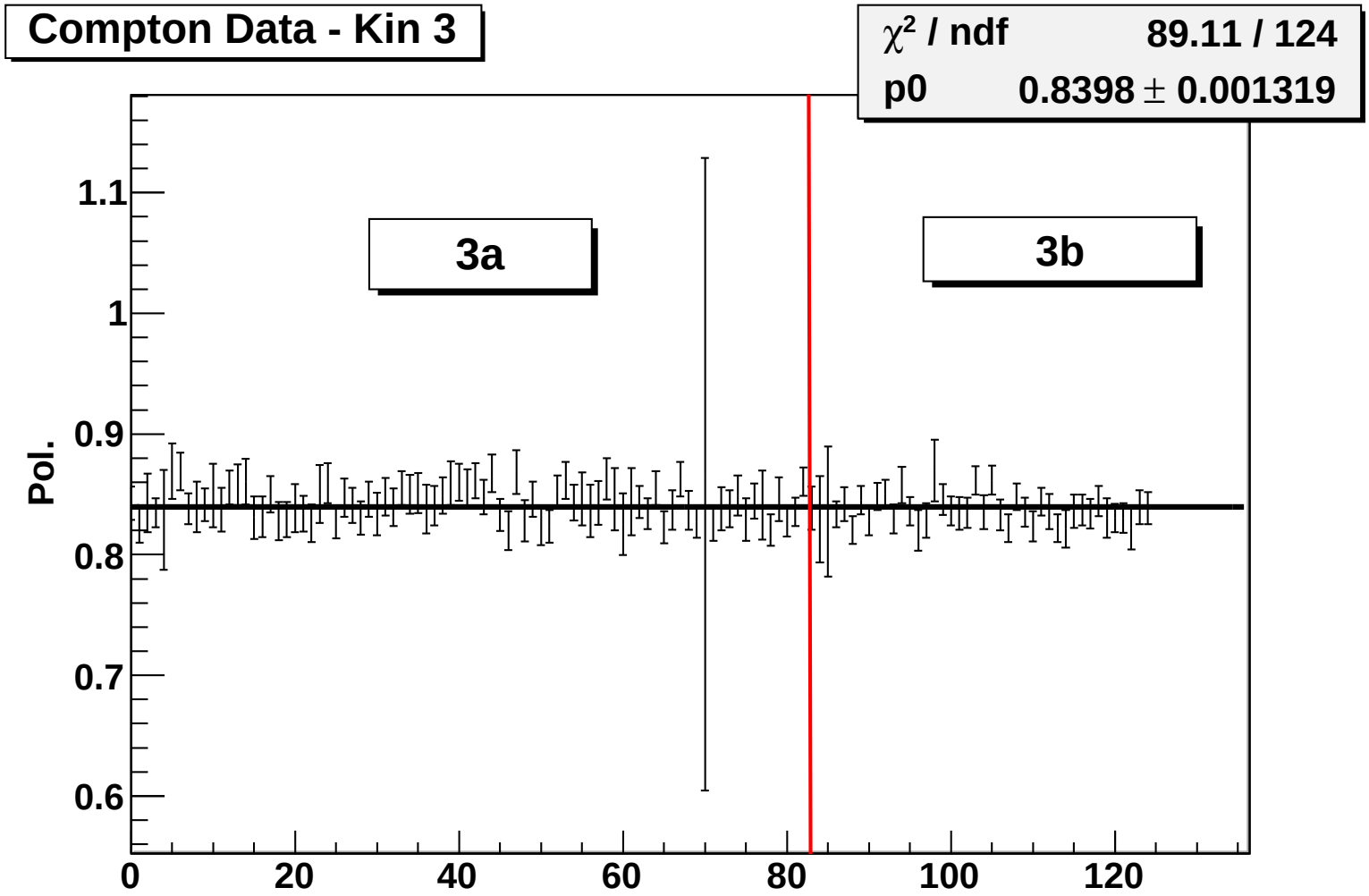
Writeup Structure

- Event Selection
  - BigBite Requirements
  - Neutron Arm Requirements
  - Good Trigger Selection
  - Quasielastic Selection
- Results

Beam Polarization

Method	Pol.	stat	sys	NDoF	χ^2/NDoF
Kin 2a					
Moller	0.8505	0.0008	0.03		
Kin 3a					
Moller	0.8165	0.0009	0.03		
Mott	0.8308	0.007	0.01		
Compton	0.8419	0.0017	0.012	83	0.68
Kin 2b					
Compton	0.8492	0.0035	0.012	24	0.46
Kin 3b					
Compton	0.8369	0.002	0.012	40	0.73
Kin 4					
Moller	0.8477	0.0020	0.03		
Moller	0.8527	0.0006	0.03		

3a + 3b Compton



Combining the two, $\chi^2/\mathrm{NDoF} = 0.72$

Beam Polarization Numbers

Kin	pol	err
2	0.8388	0.011
3	0.8337	0.008
4	0.8523	0.030

Instrumental Asymmetry

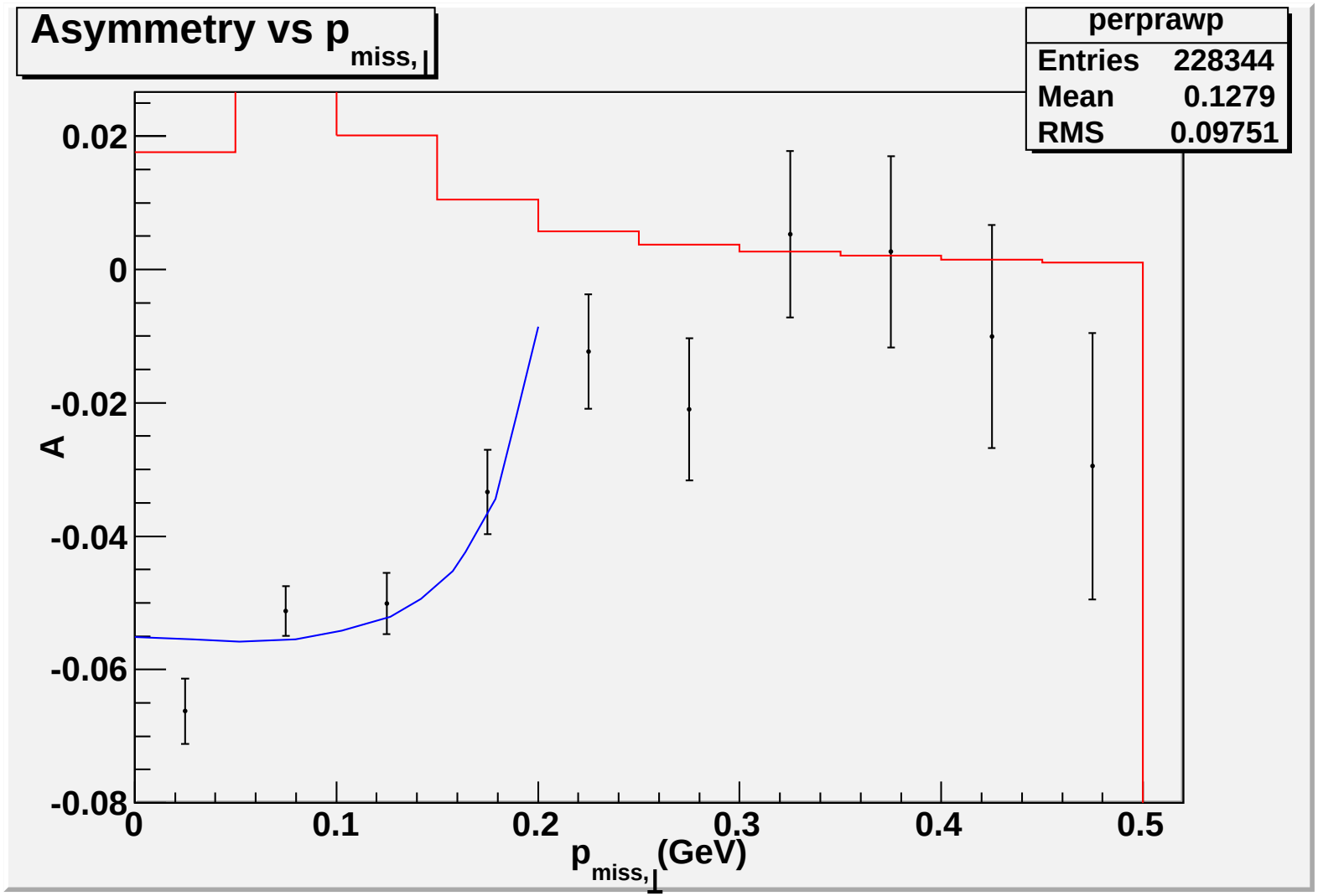
- Beam charge asymmetry - bcm scalers, cut on drift chamber trips
- Tracking - Events skipped due to high number of hits/Total events, differentiated by helicity
- DAQ - T3 Events Recorded/T3 Events Triggered
- Electronic - T7 events found in T3 events/T7 events expected in T3 events

Instrumental Asymmetry

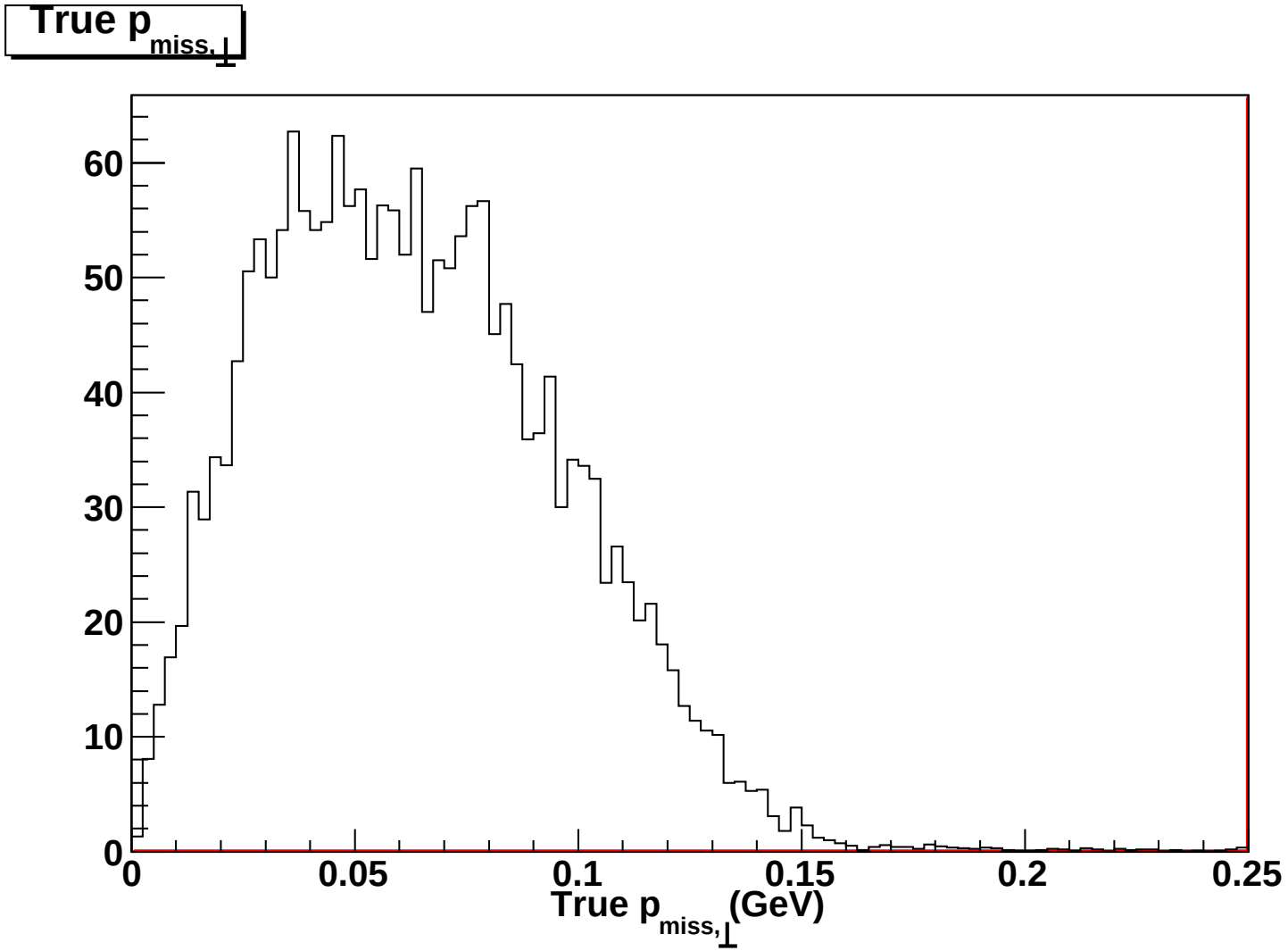
Kin	A_{raw}	Inst.
4	-0.0544	0.0003
2	-0.0484	0.0009
3	-0.0393	0.0003

$p_{\mathrm{miss},\perp}$ Cut Dependence

From last week + old Misak prediction:

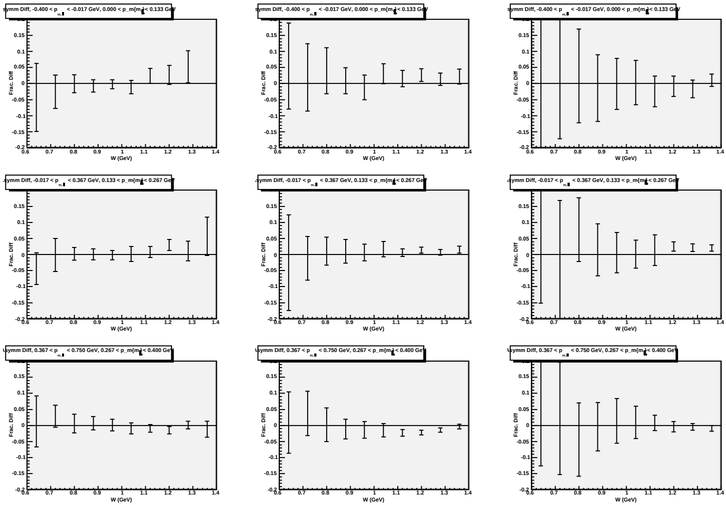


$p_{\mathrm{miss},\perp}$ Cut Dependence

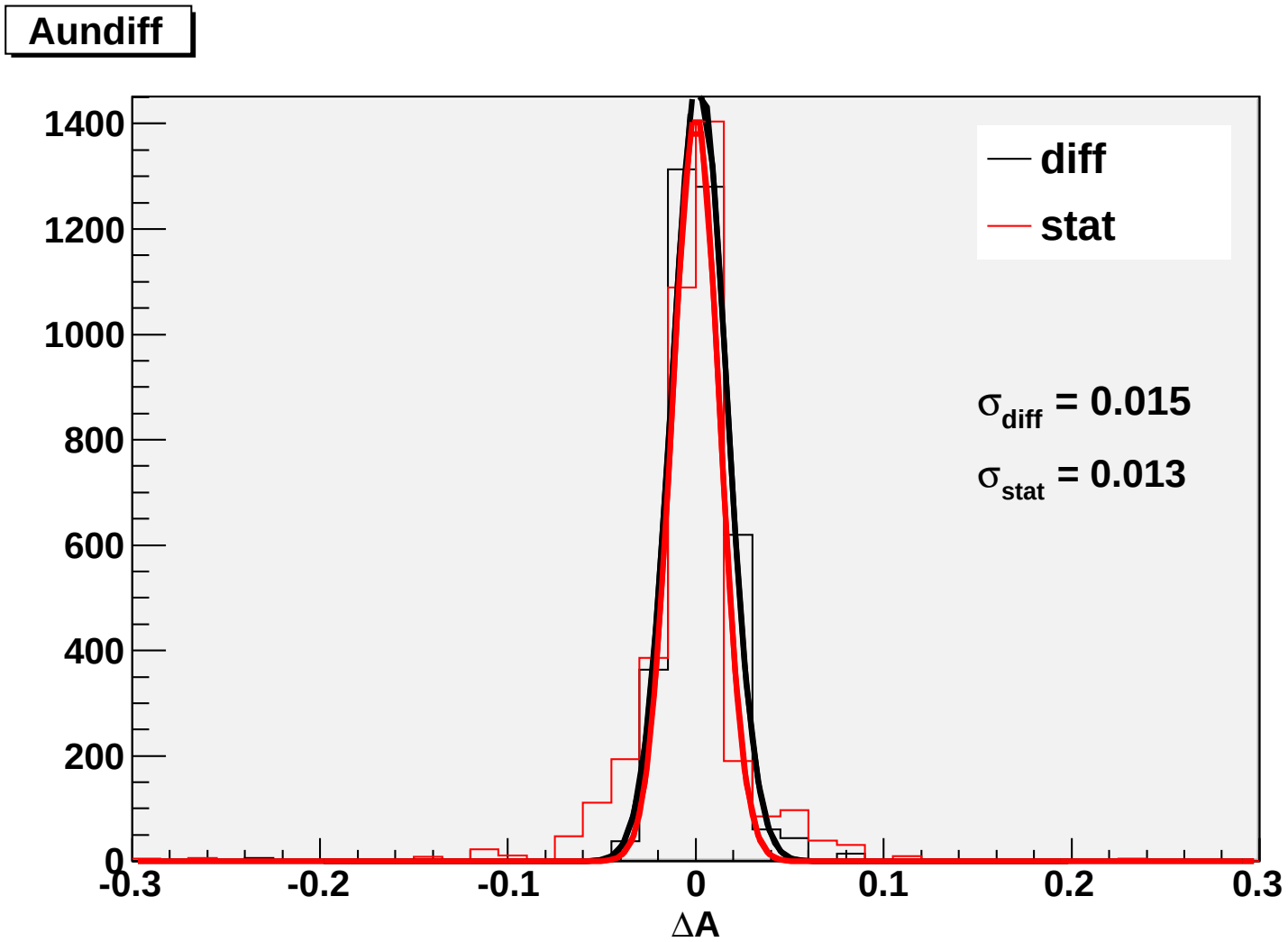


$A_{\mathrm{obs}}/A_{\mathrm{real}} = 0.994$

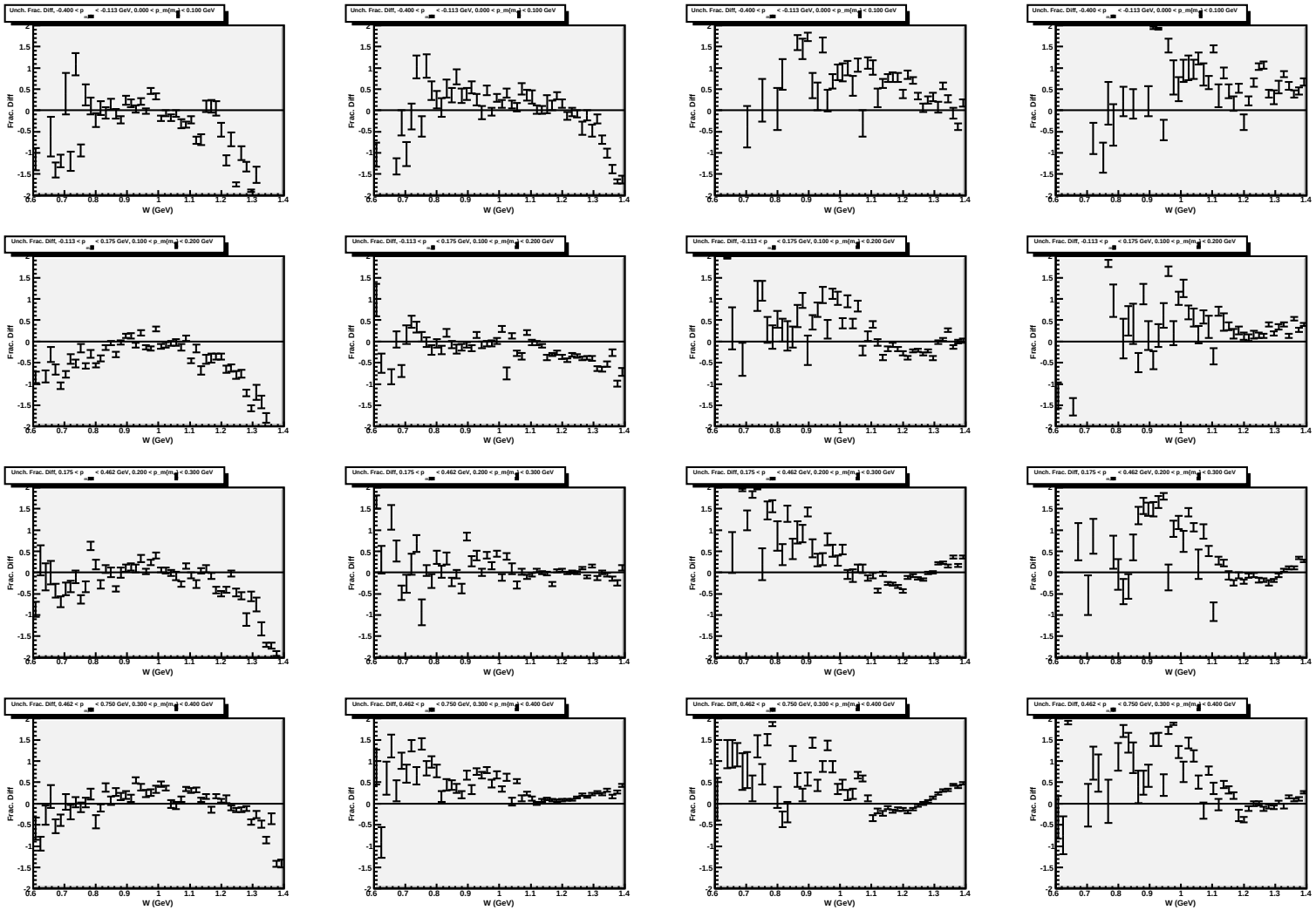
Monte Carlo - Systematic Error



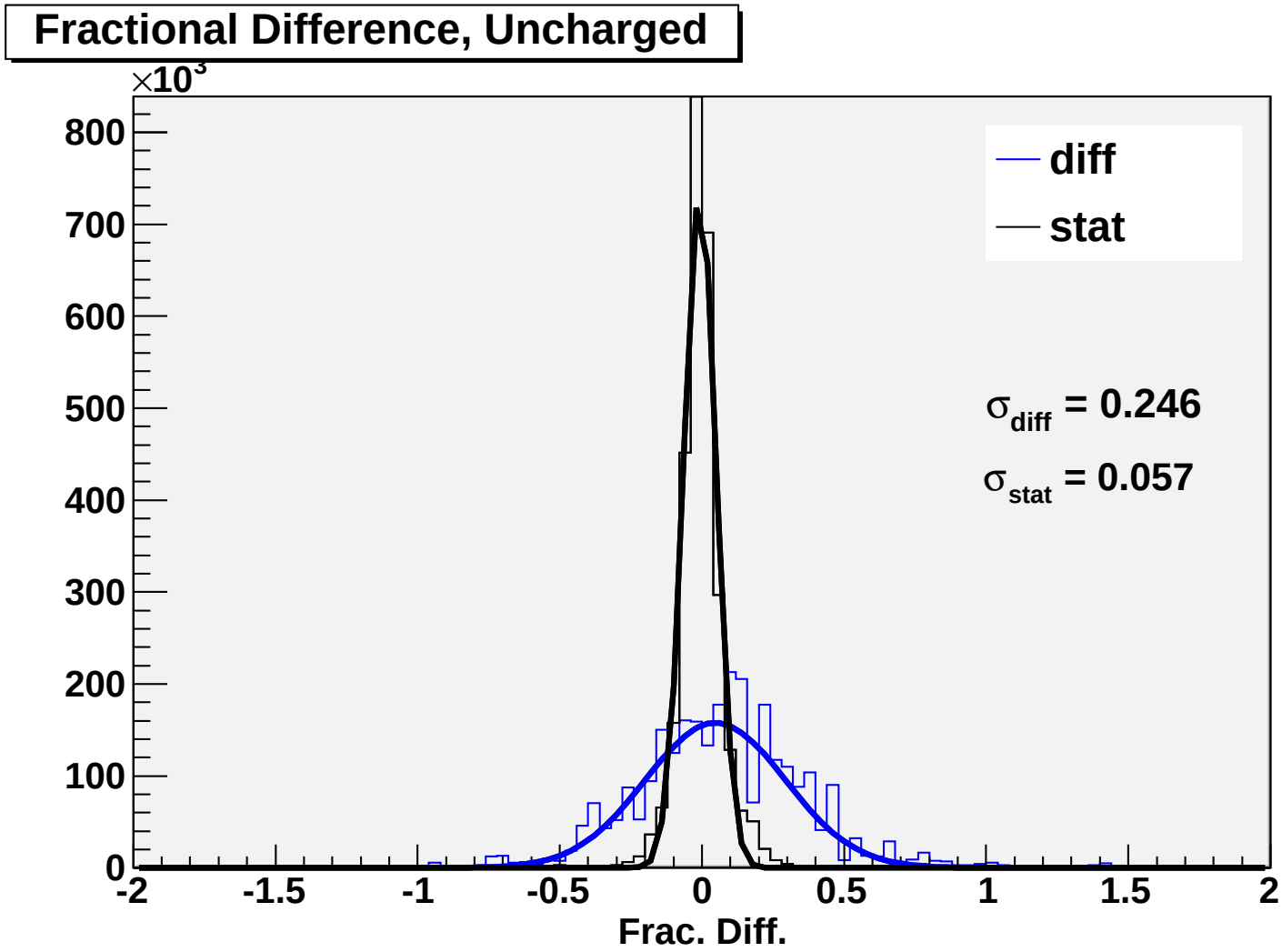
Monte Carlo - Systematic Error



Monte Carlo - Systematic Error



Monte Carlo - Systematic Error



To Do

- Evaluate systematic error for MC
- Put together writeup