

SKZP for NOvA

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Implementing SKZP in NOvA

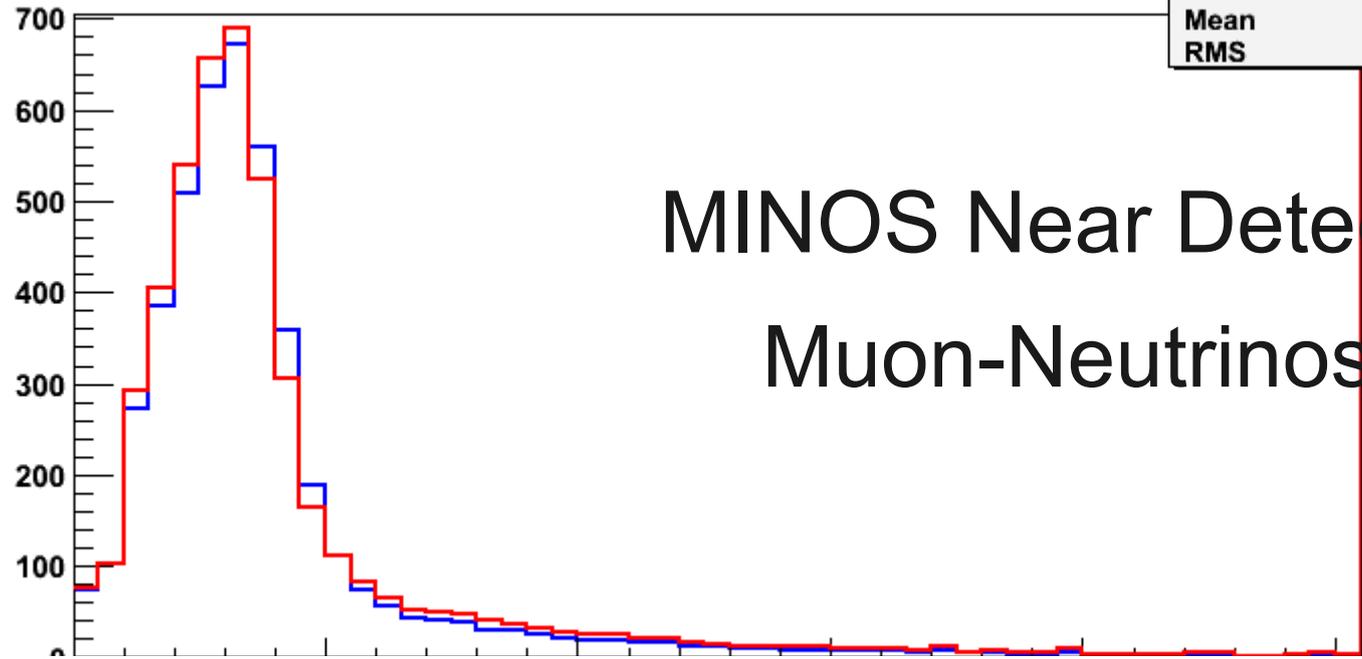
- Previously I showed only the Zfluk/hadron-production half of SKZP
- Now I've added the Zbeam/beam-focusing part of the reweighting
- I moved the SKZP reweighting out of MCFlux and into package/class SKZP/skzpReweight
- I also made “Conventions.h” for the enums
- Will be uploaded into CVS soon.

enu_numu_minosnd	
Entries	3701795
Mean	3.849
RMS	3.11

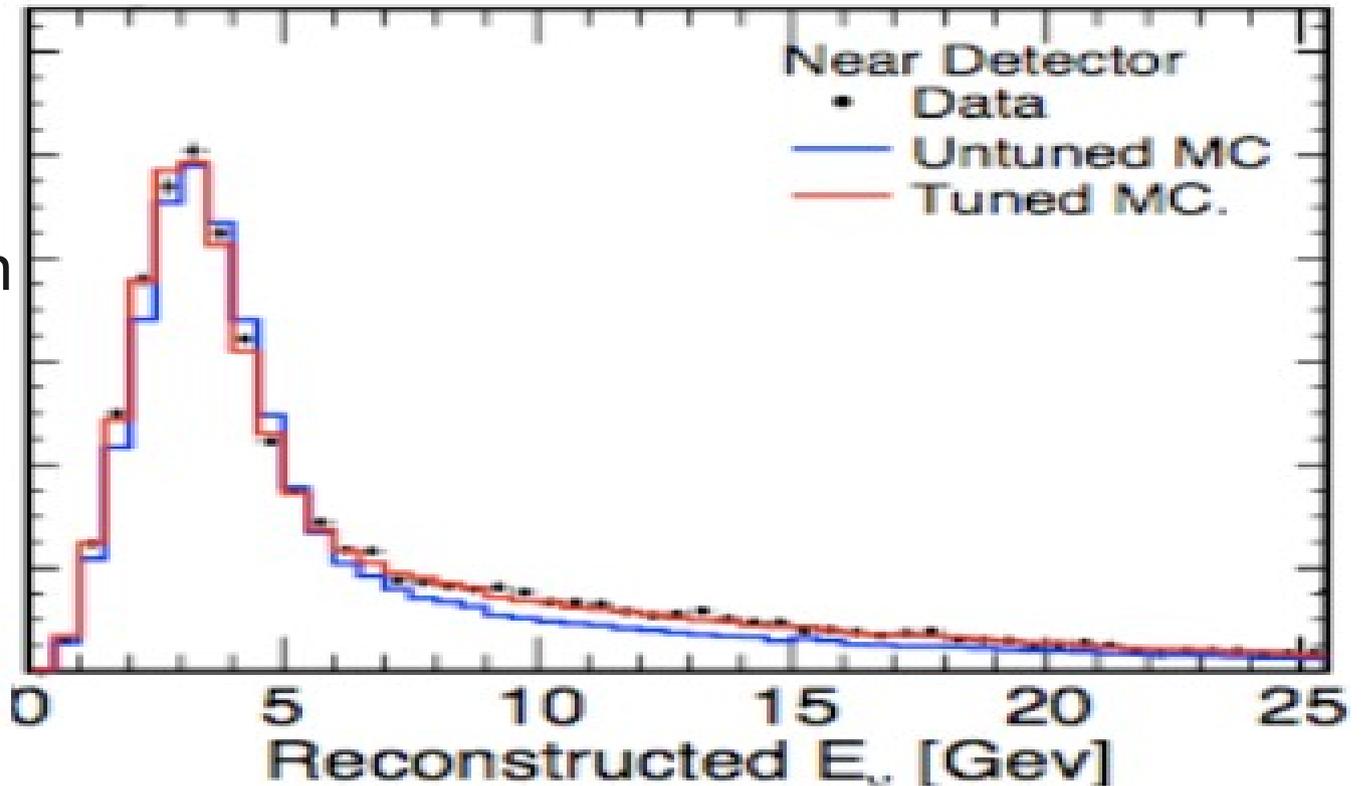
MINOS Near Detector Muon-Neutrinos

From MCFlux
FlukReweight() :

- Weighted
- Unweighted



From Mark Dorman
paper Figure 9:



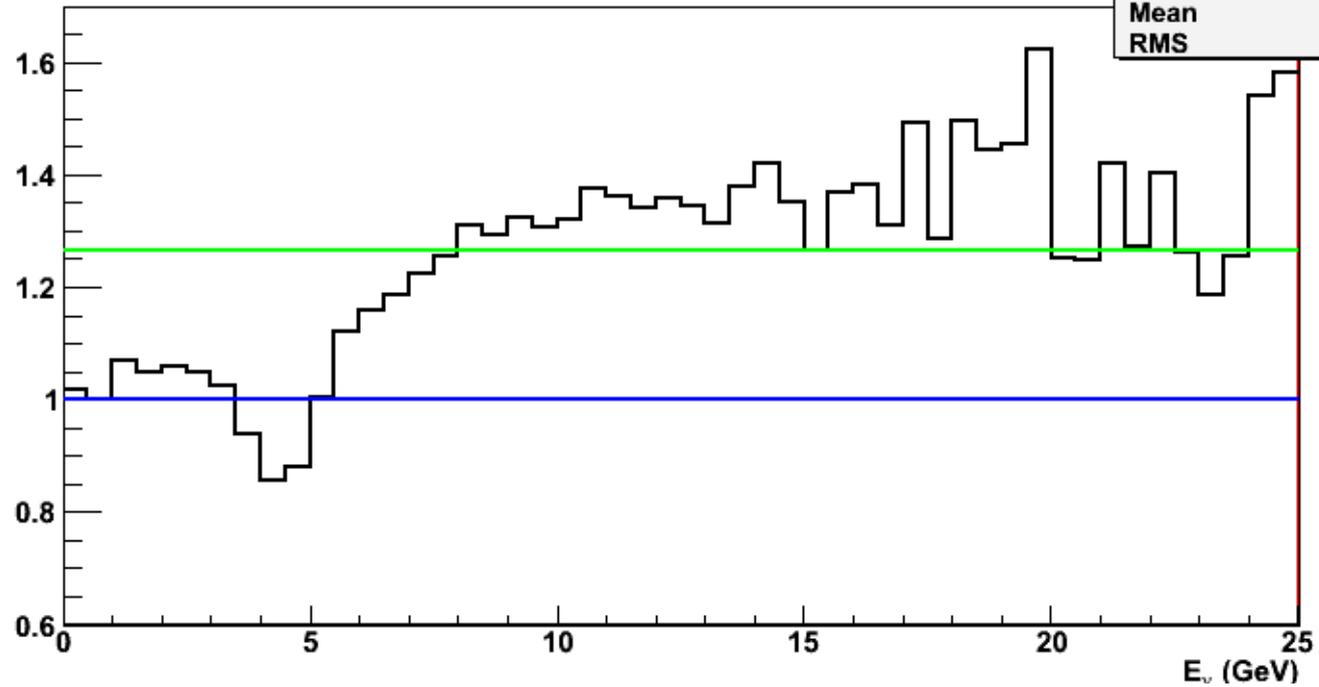
Fluk & Beam Weighted/Unweighted

enu_numu_minosnd_TotalRatio	
Entries	50
Mean	13.25
RMS	7.025

From MCFlux

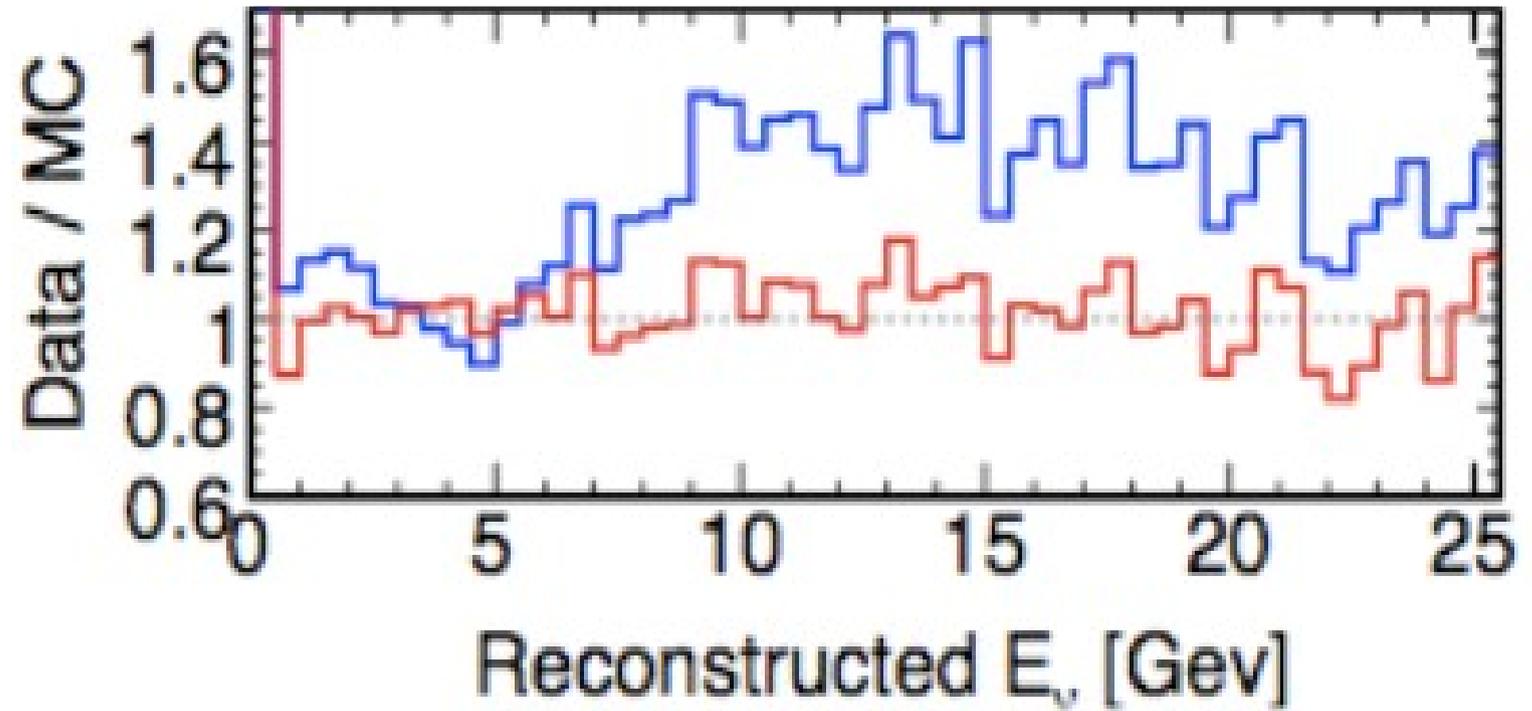
FlukReweight() :

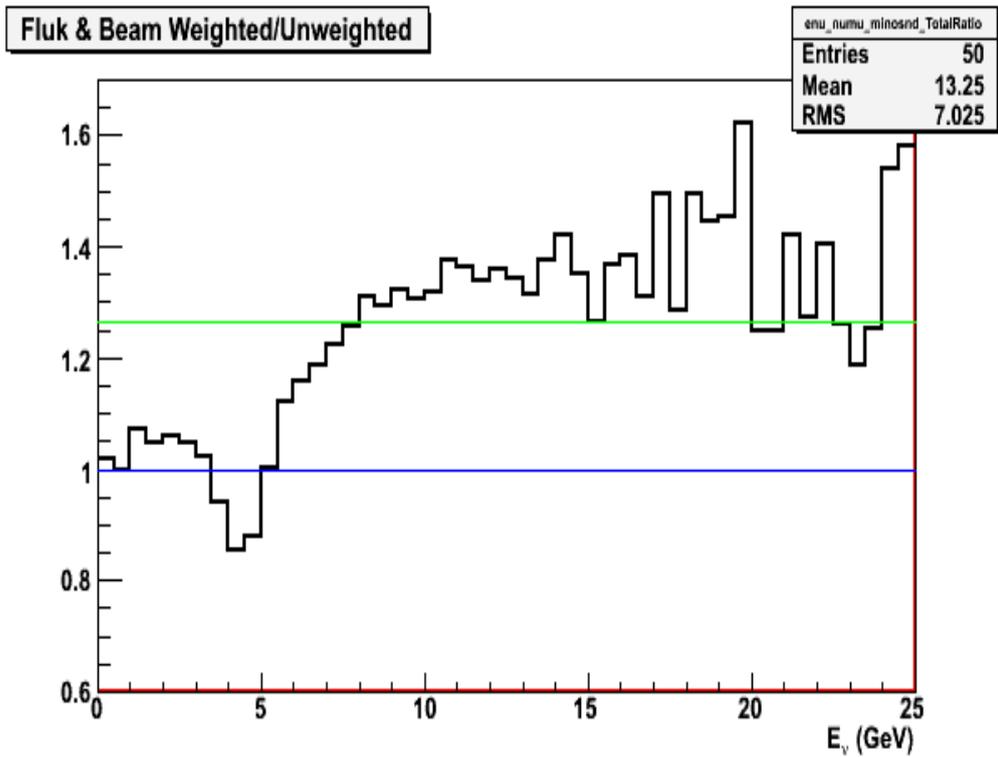
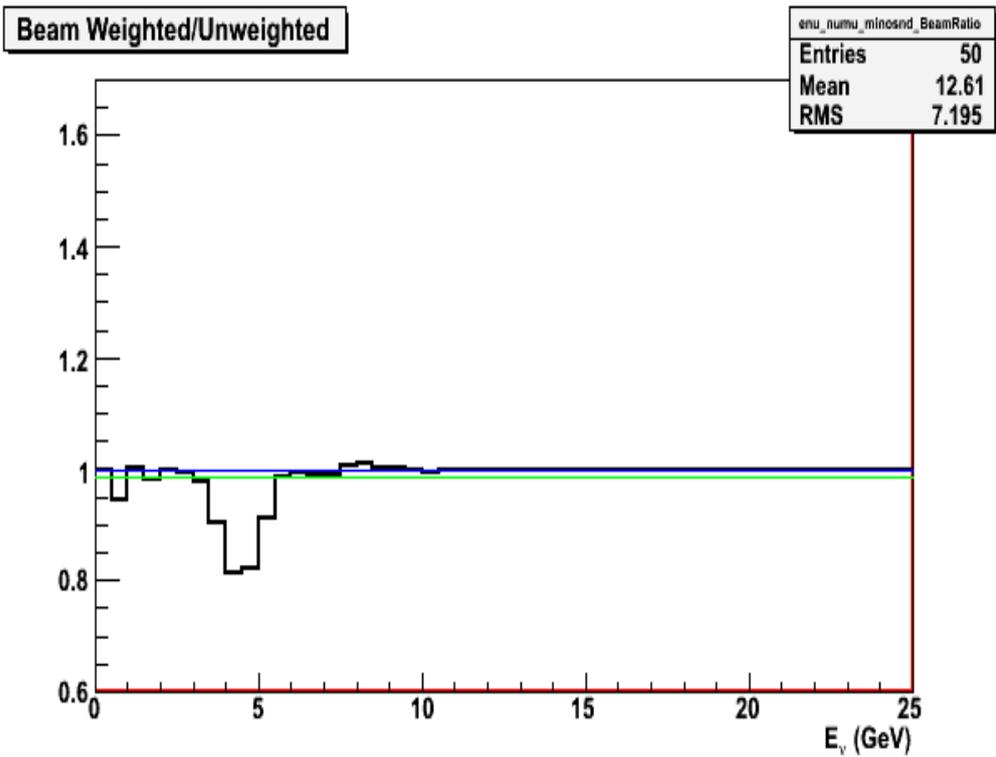
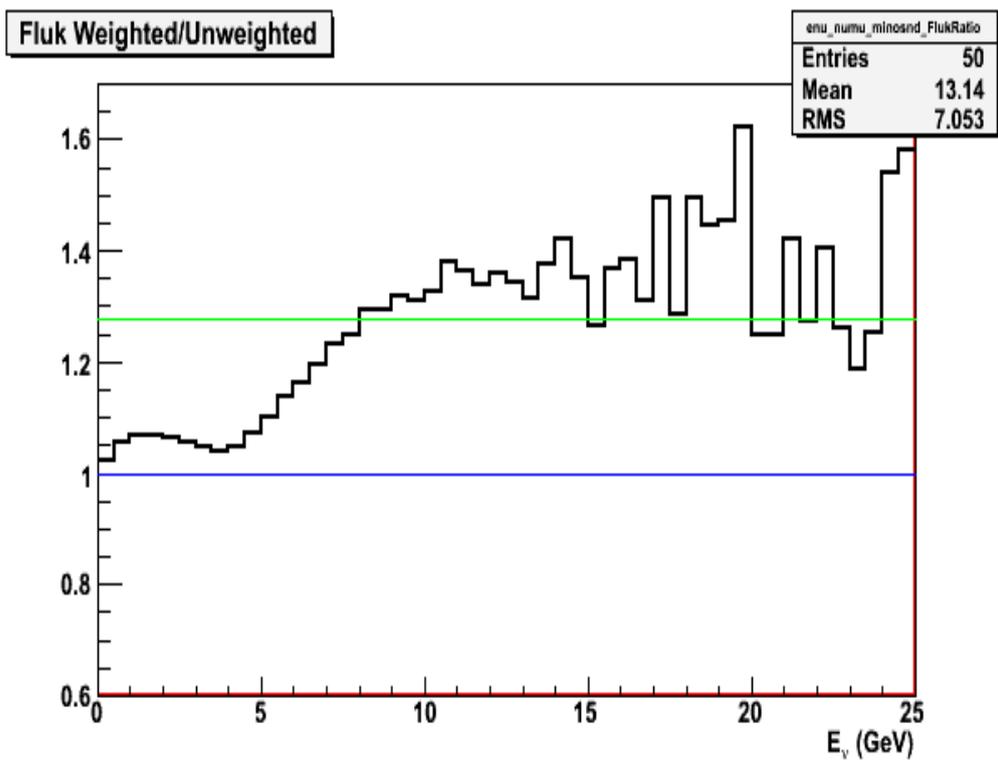
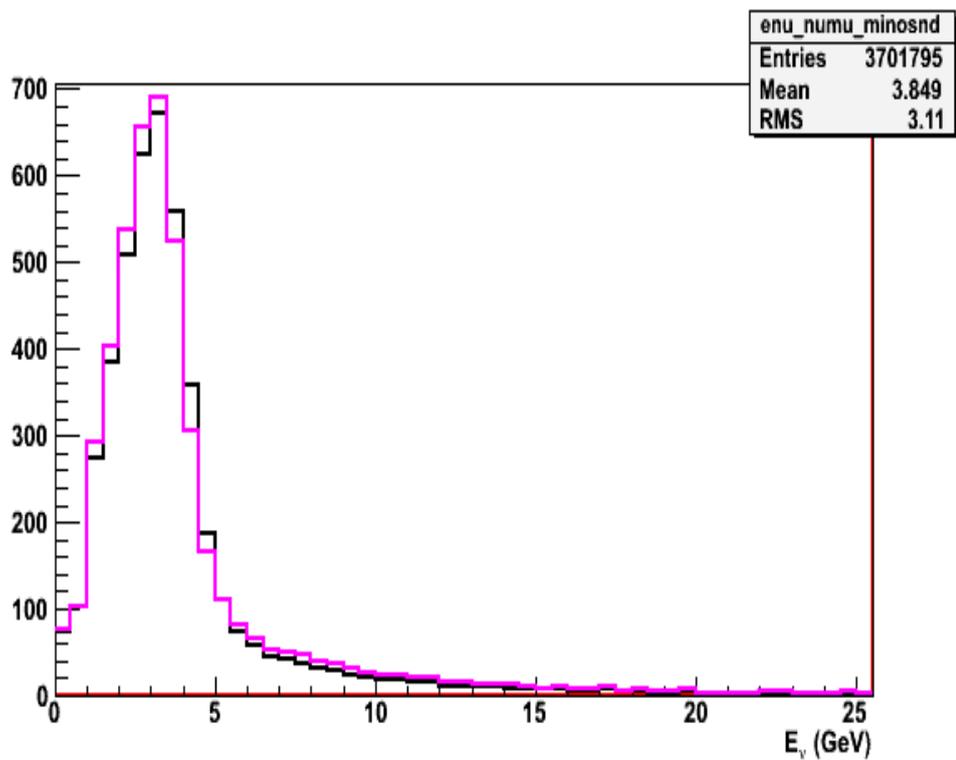
- Weighted-Unweighted Ratio
- Average
- Unity



MINOS Near Detector Muon-Neutrinos

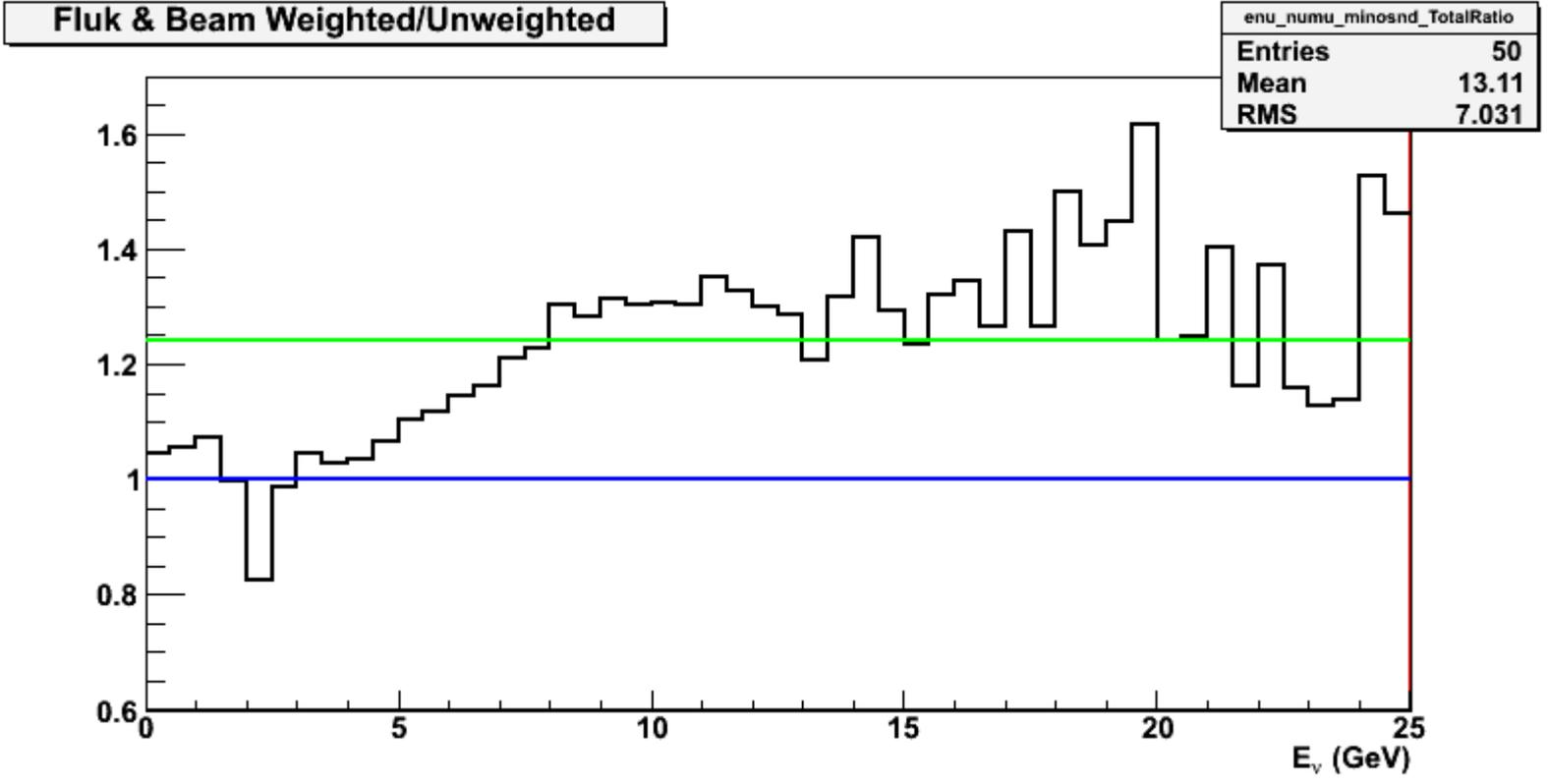
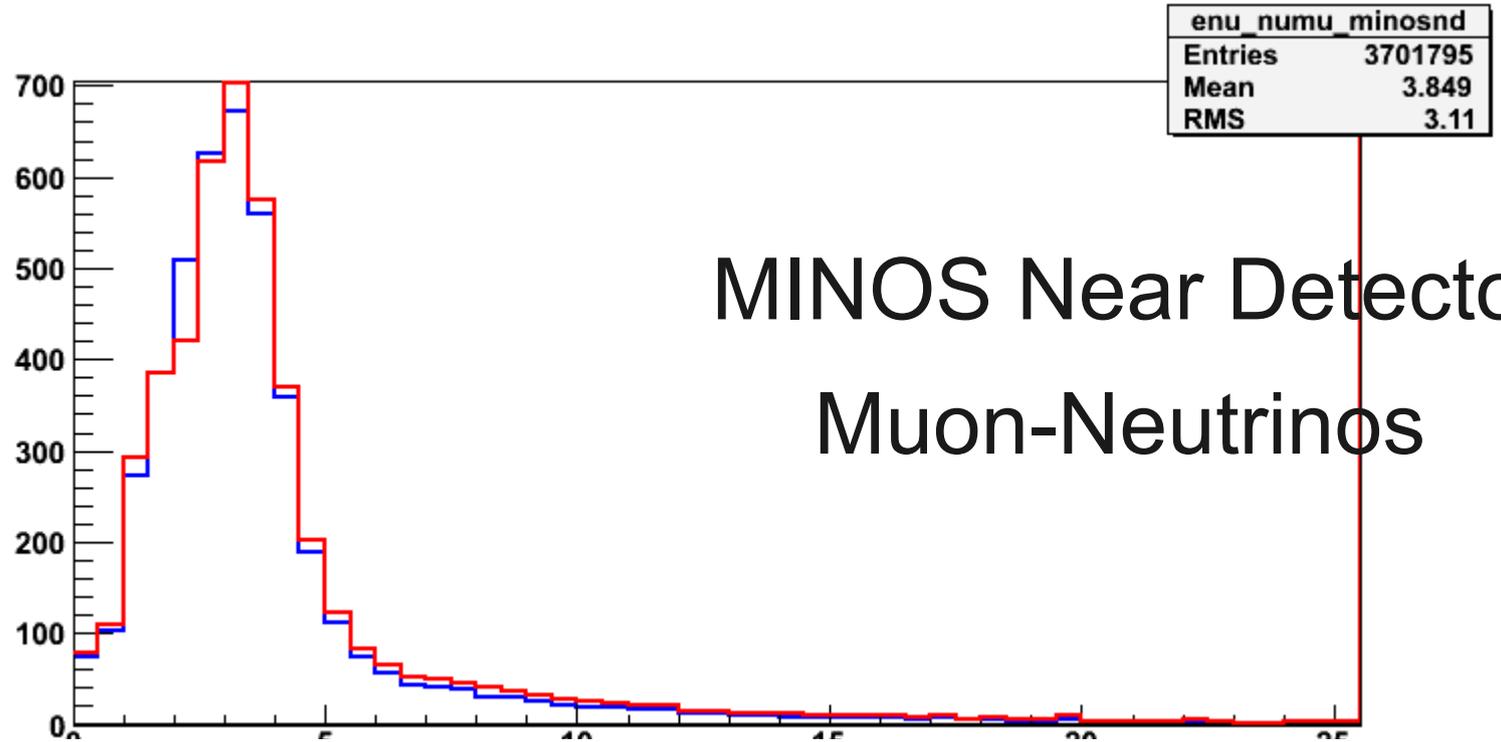
From
(minos-doc-7146)
Mark Dorman
paper Figure 9:

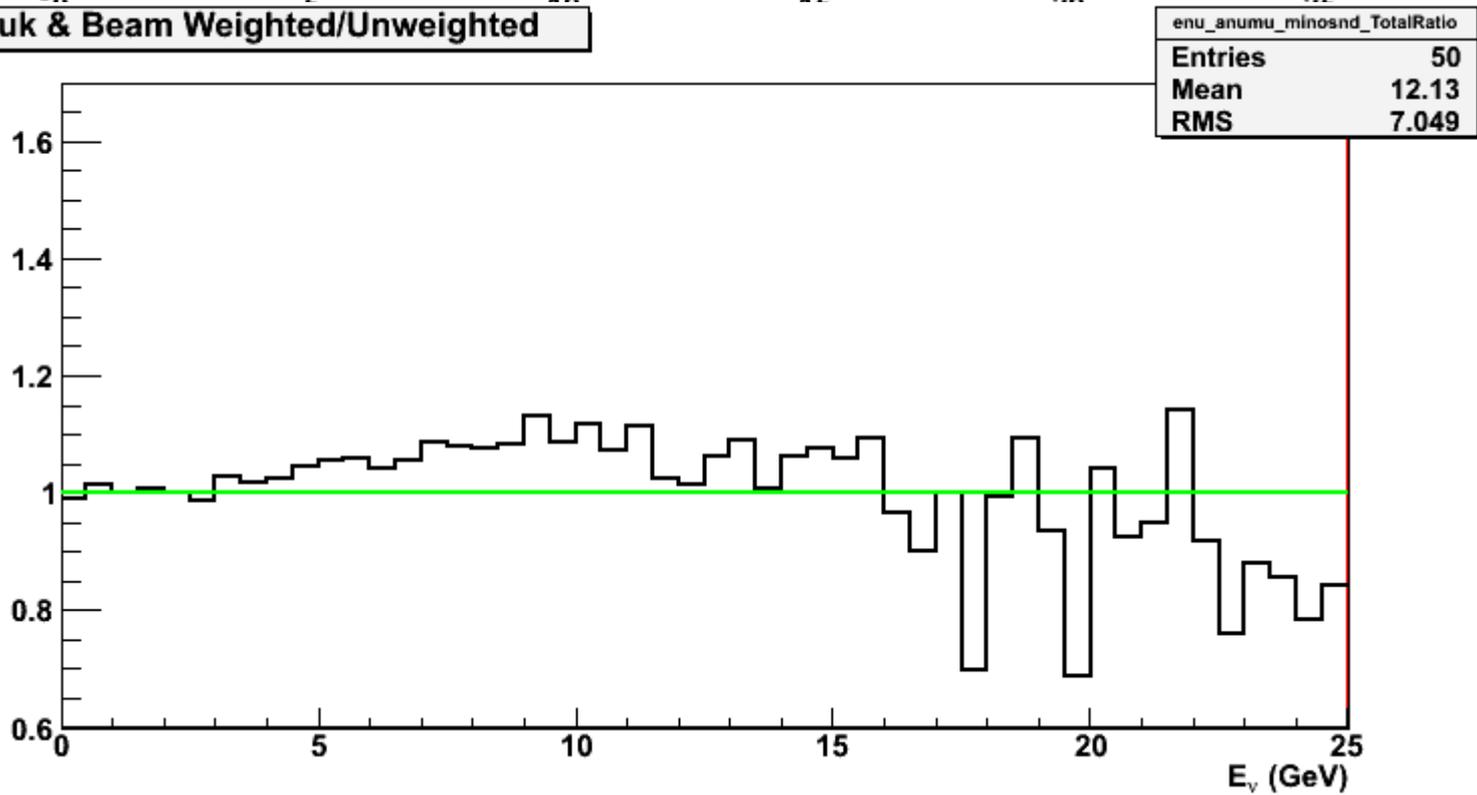
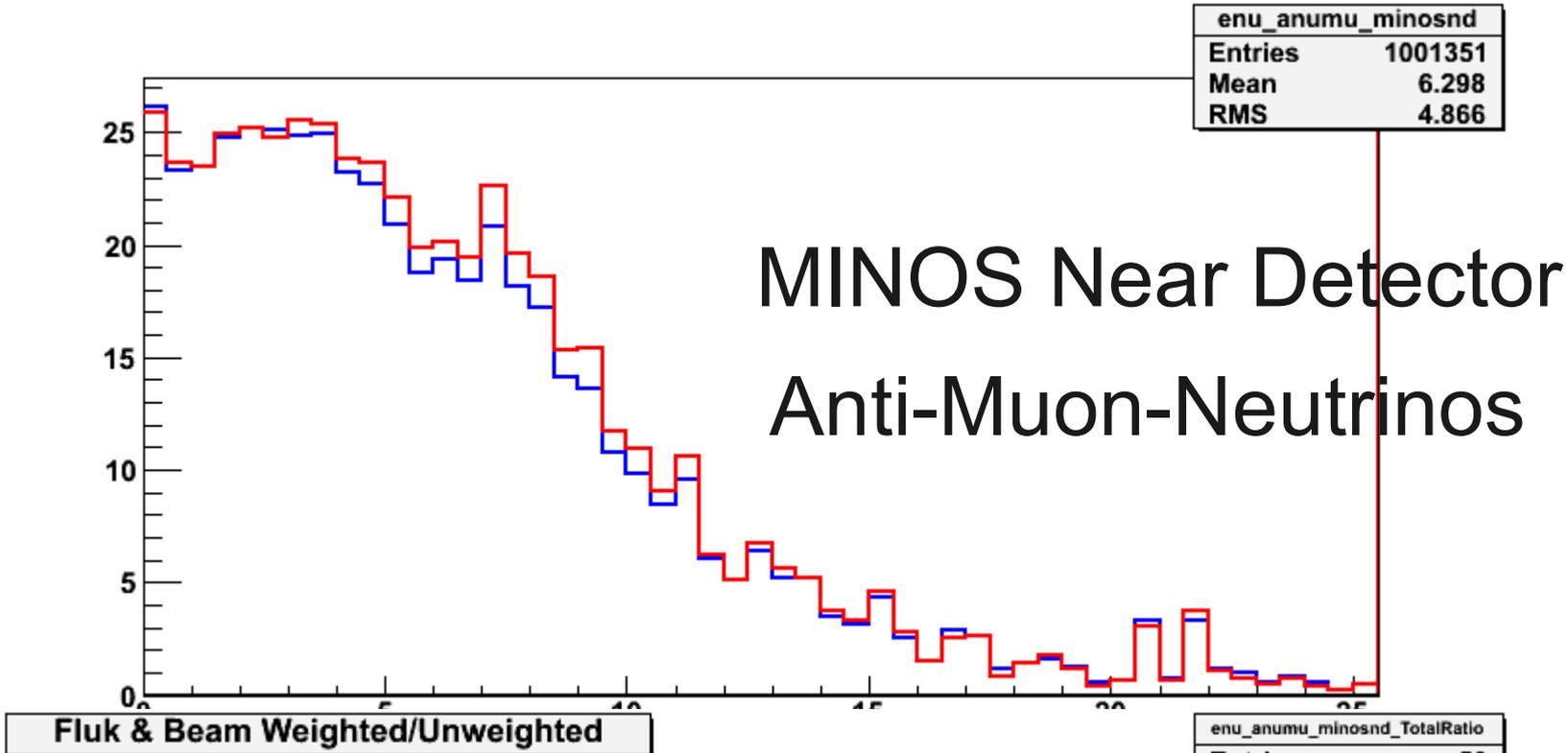


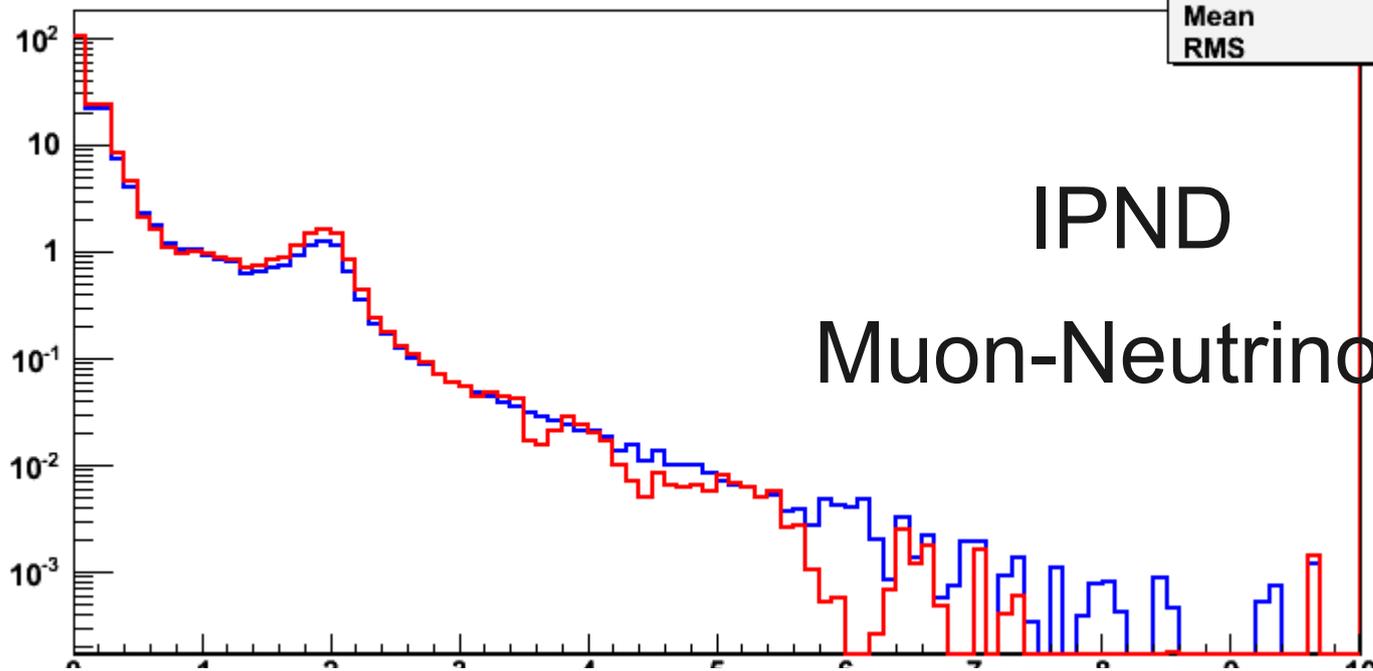


FLUGG vs. PBEAM

- The next histograms are from PBEAM, not FLUGG, so they will not quite match
 - FLUGG is a large comprehensive program
 - PBEAM is an old, simple focusing program
- We can use PBEAM to find weighting for NOvA that includes beam-systematics





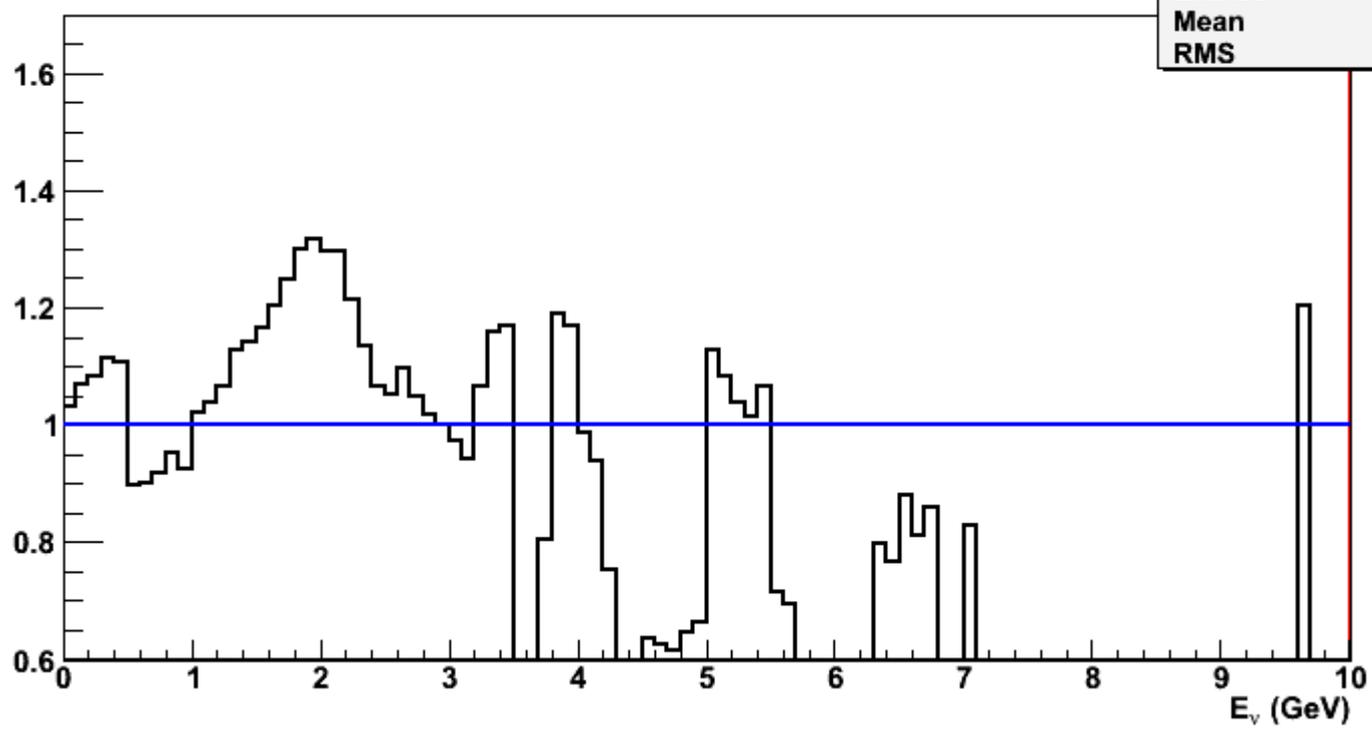


enu_numu_ipnd	
Entries	3701795
Mean	0.252
RMS	0.4944

IPND

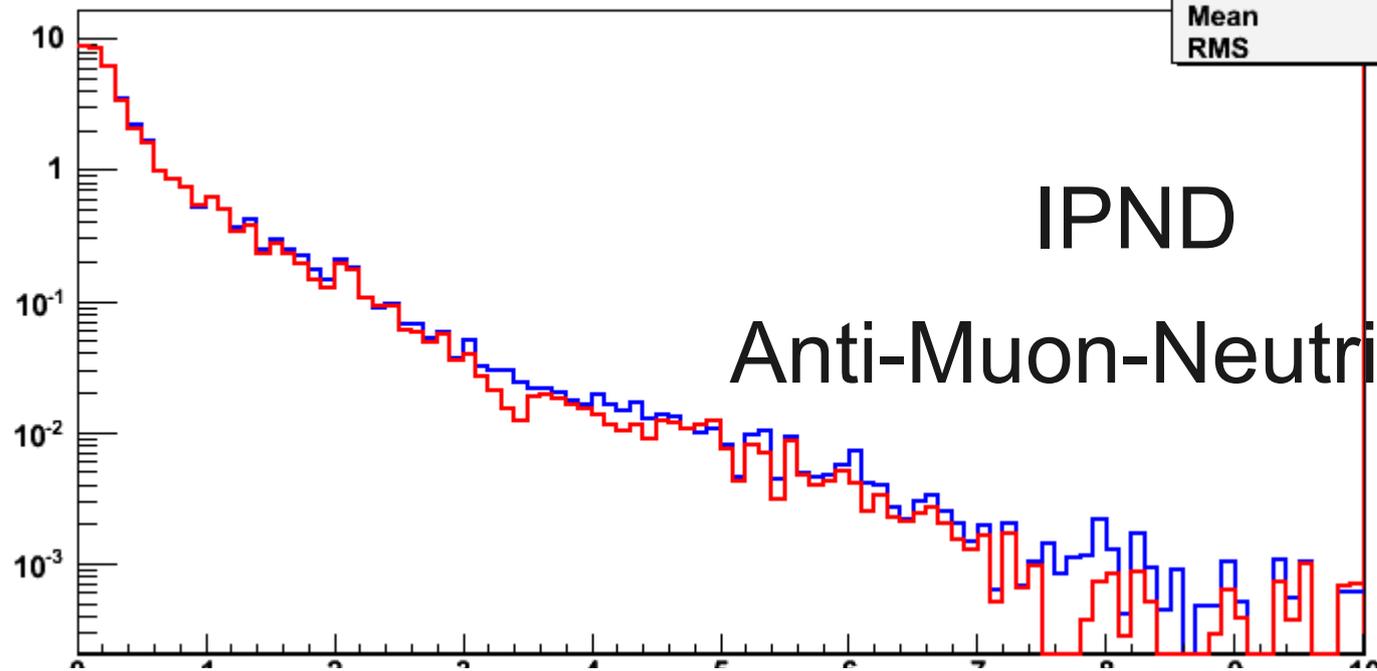
Muon-Neutrinos

Flux & Beam Weighted/Unweighted



enu_numu_ipnd_TotalRatio	
Entries	84
Mean	3.736
RMS	2.534

E_ν (GeV)

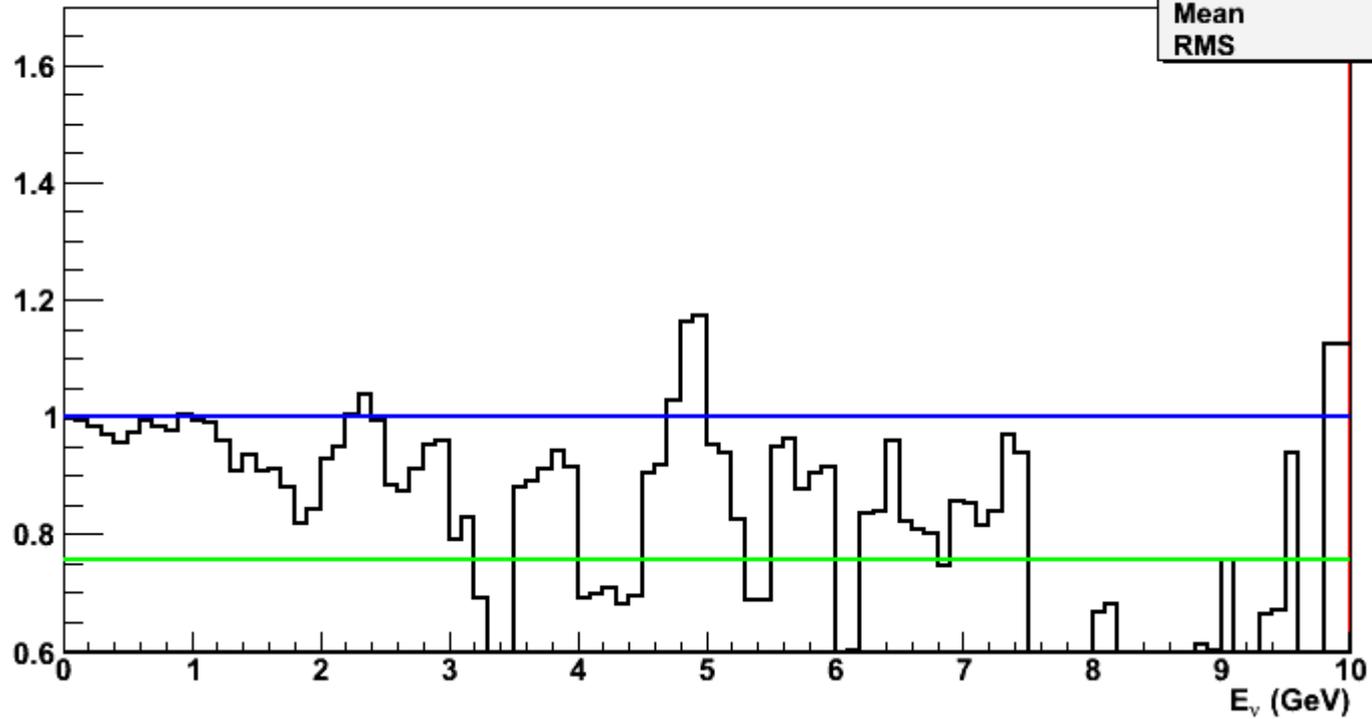


enu_anumu_ipnd	
Entries	1001351
Mean	0.4595
RMS	0.6869

IPND

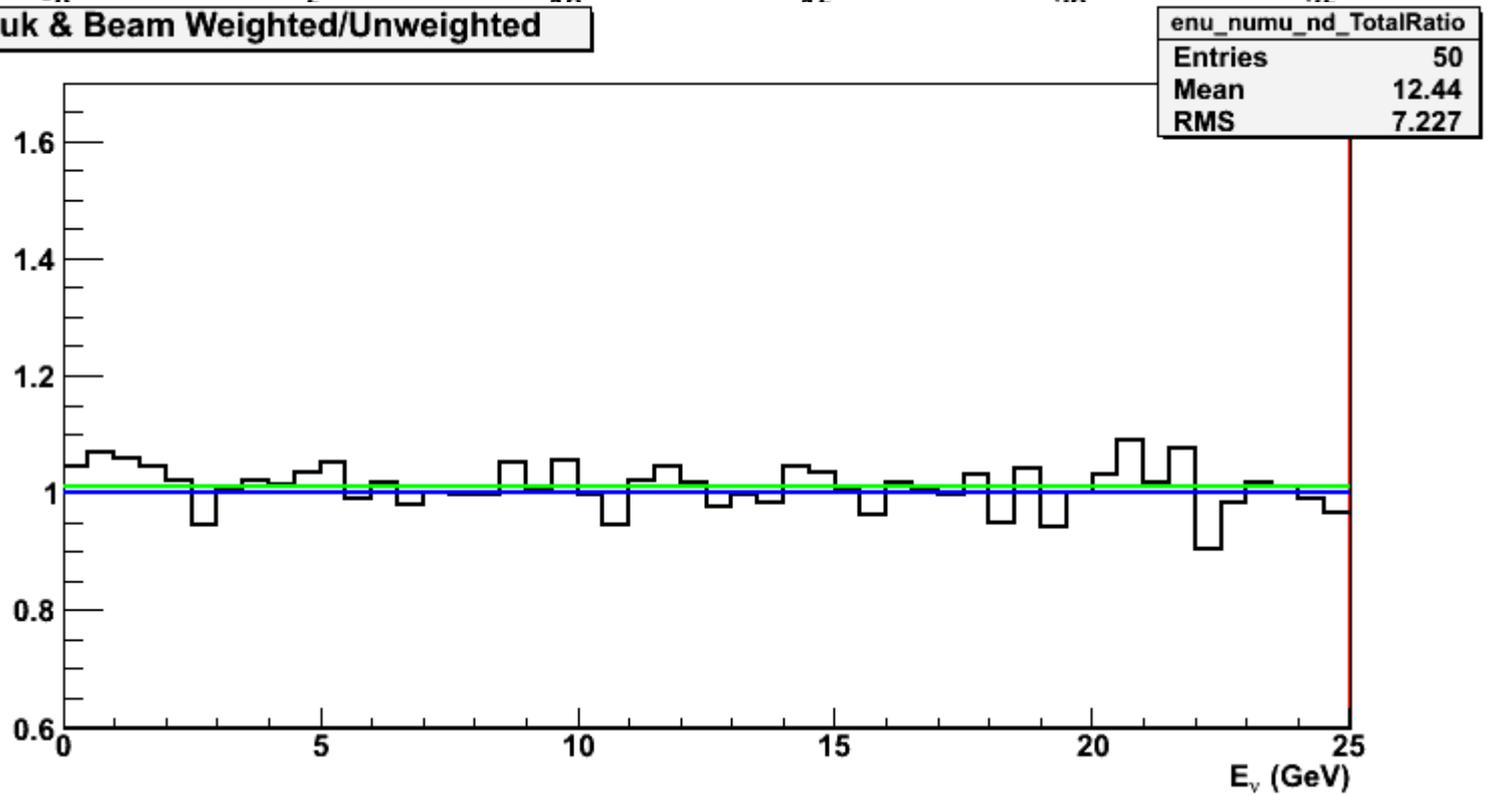
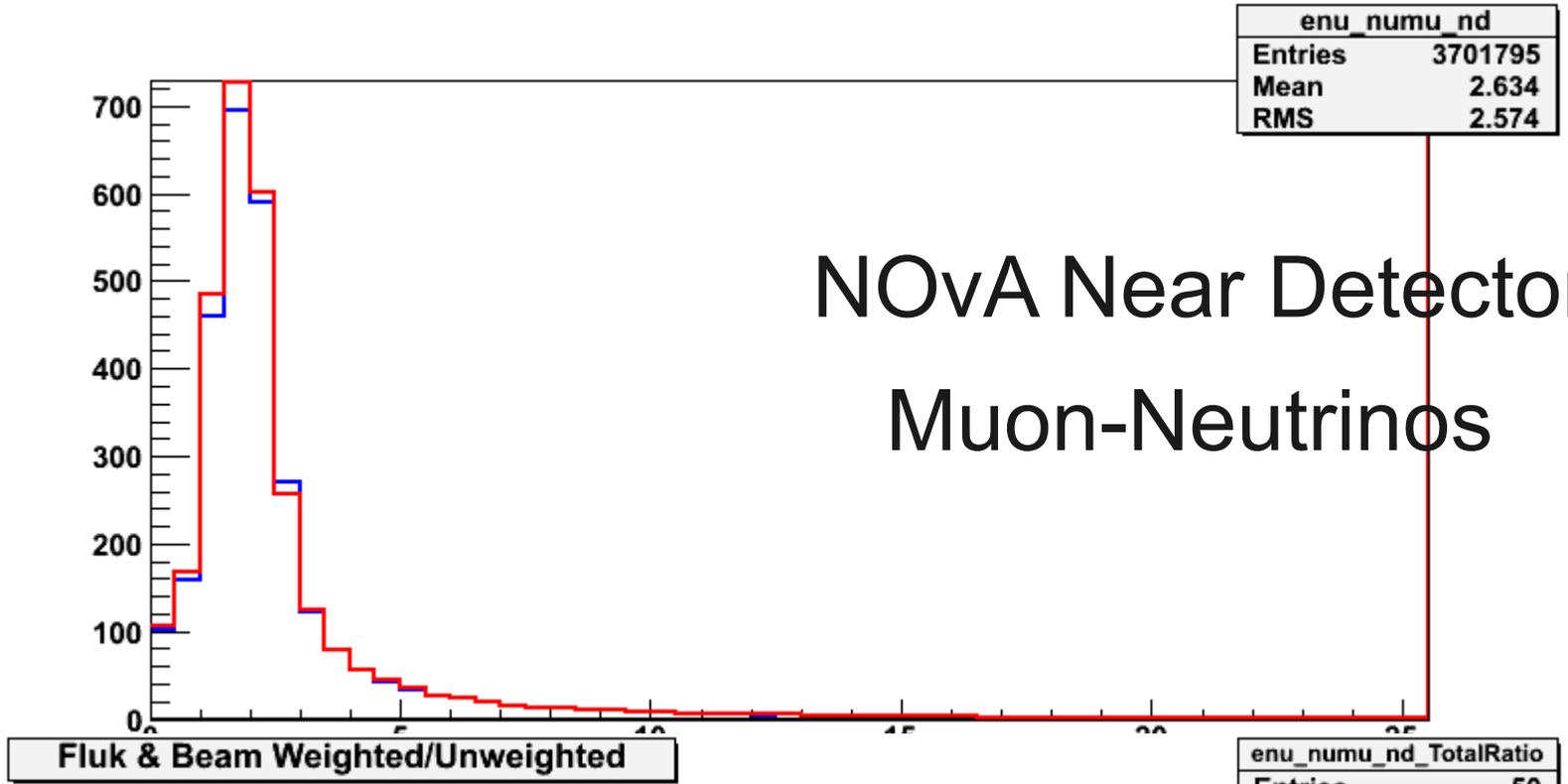
Anti-Muon-Neutrinos

Flux & Beam Weighted/Unweighted

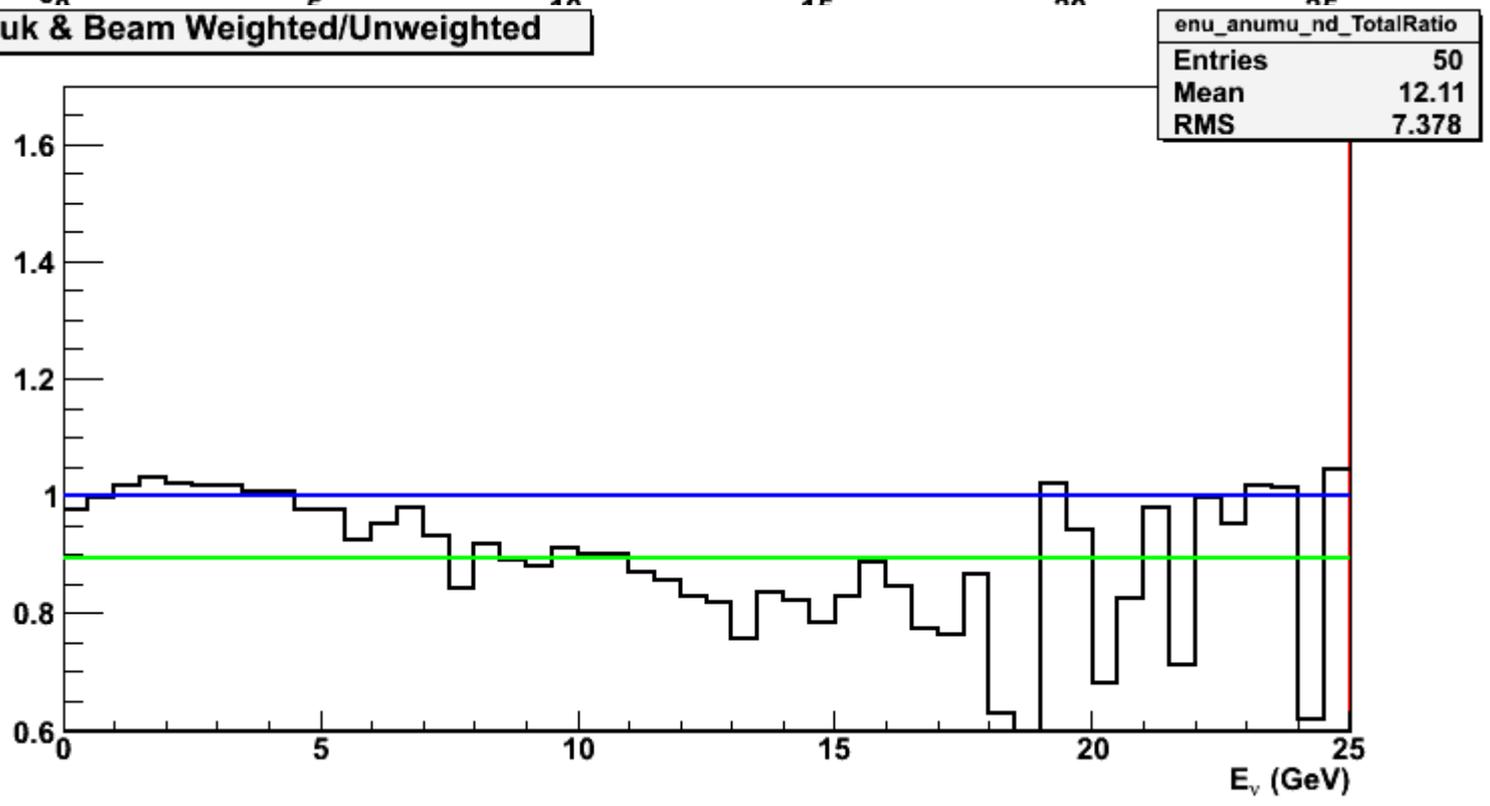
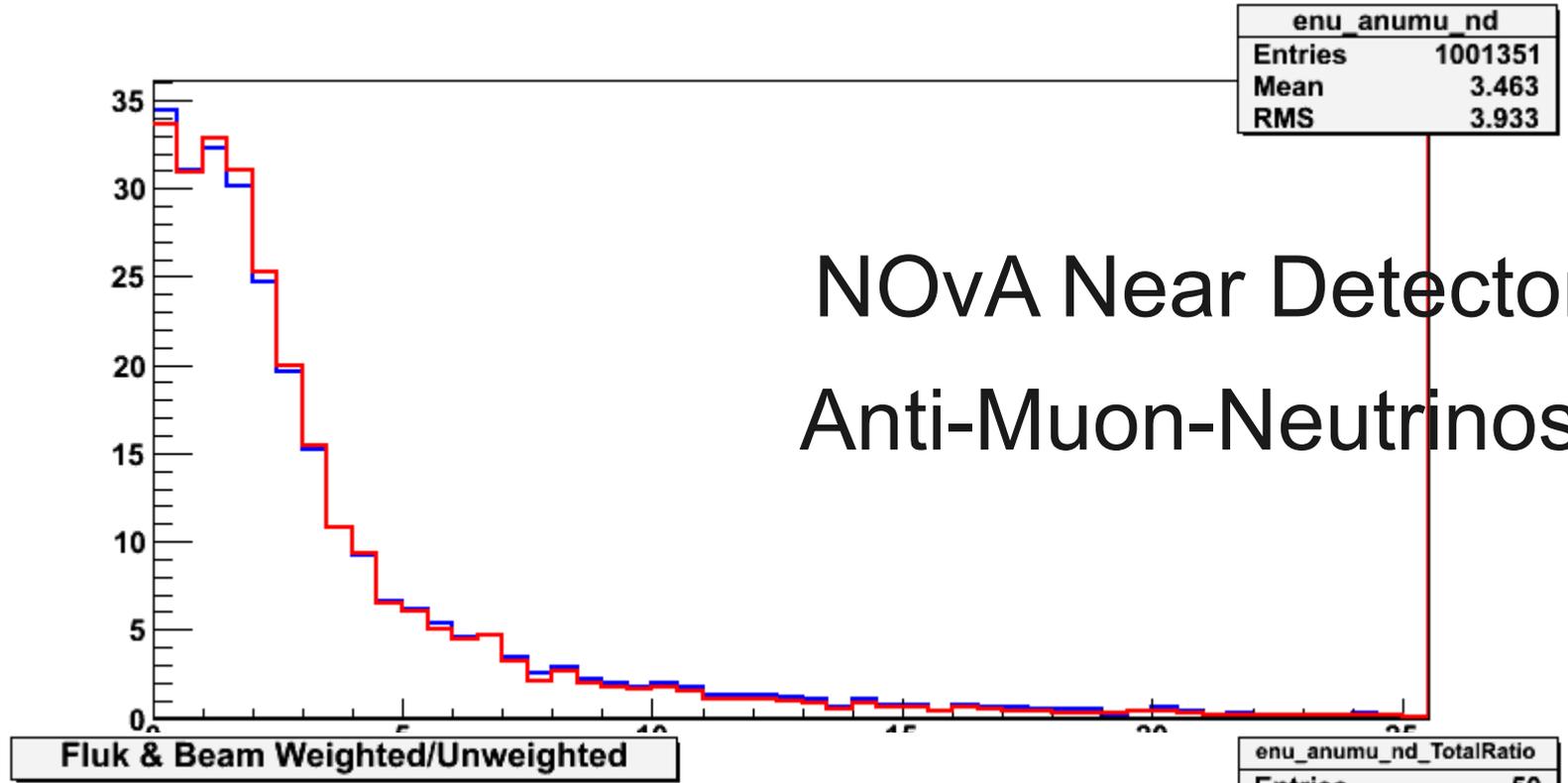


enu_anumu_ipnd_TotalRatio	
Entries	95
Mean	4.376
RMS	2.753

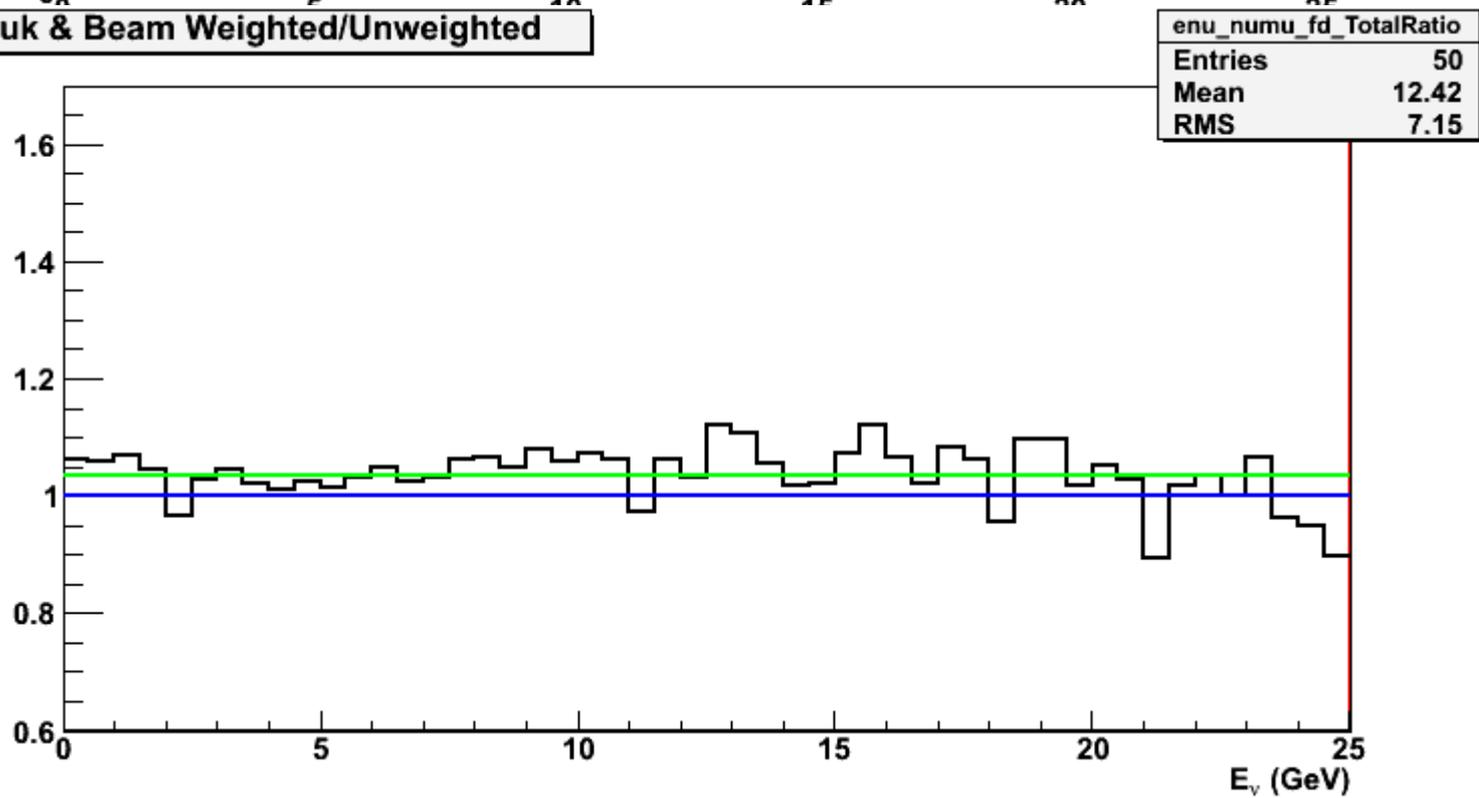
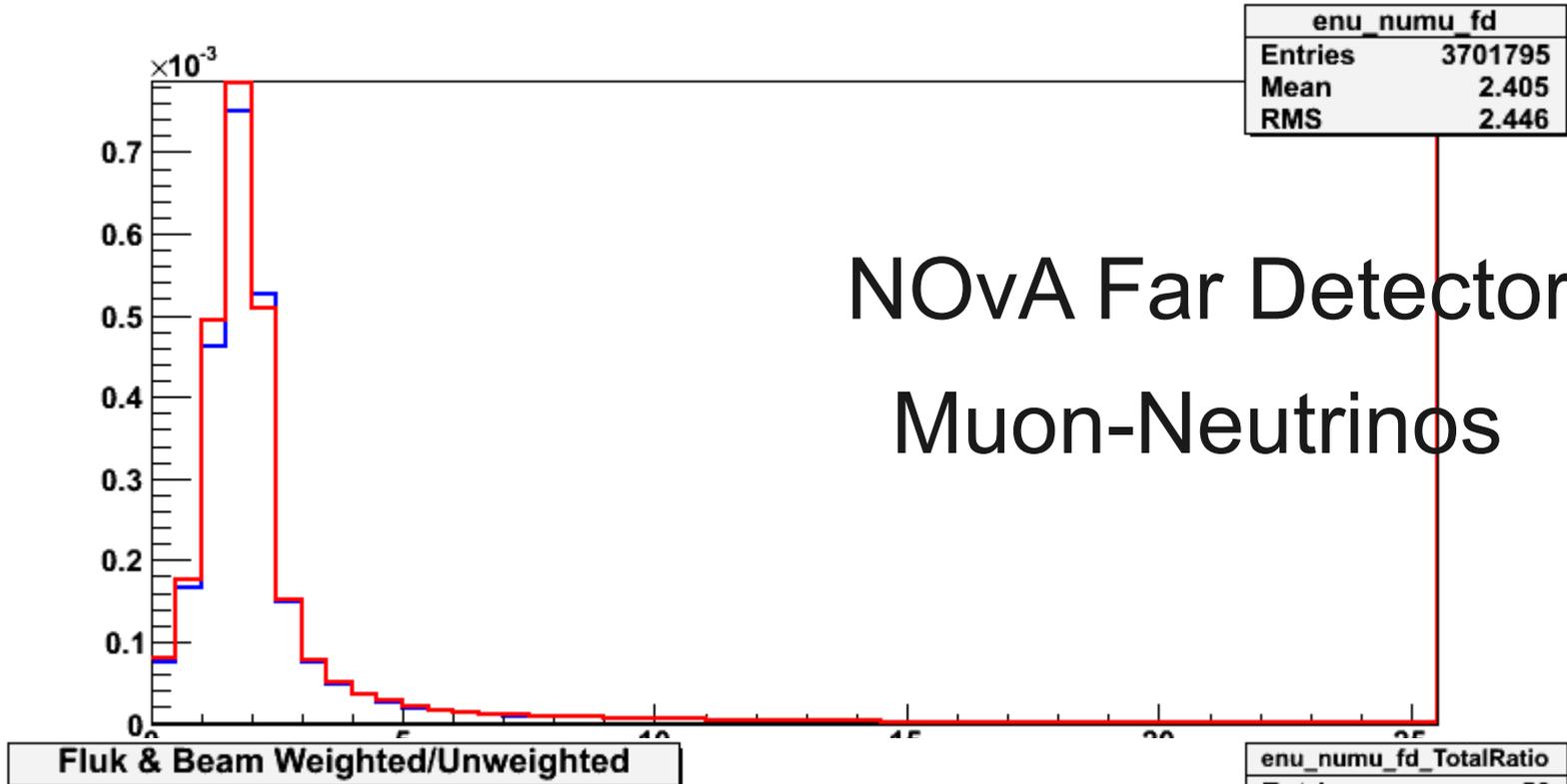
NOvA Near Detector Muon-Neutrinos



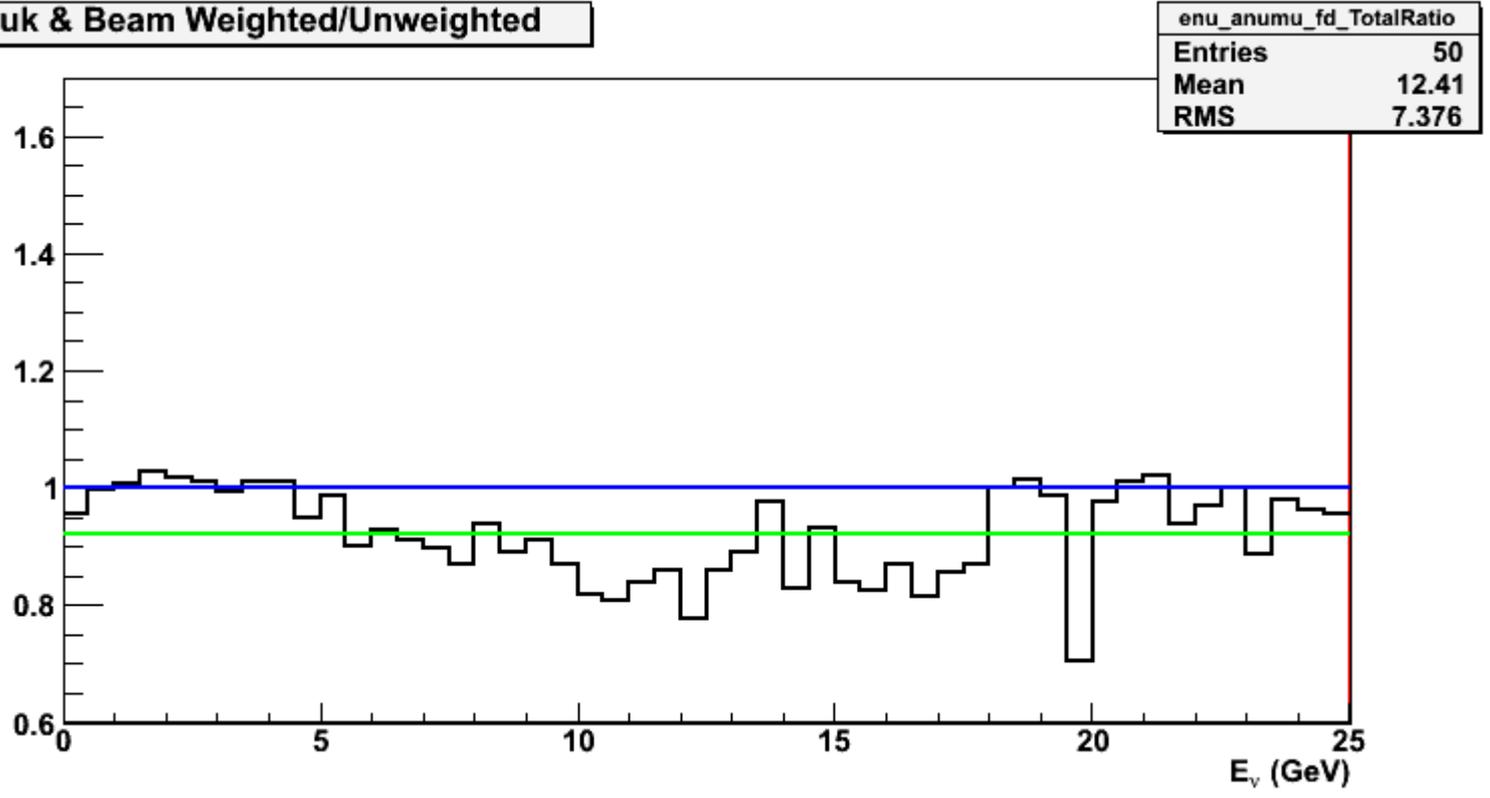
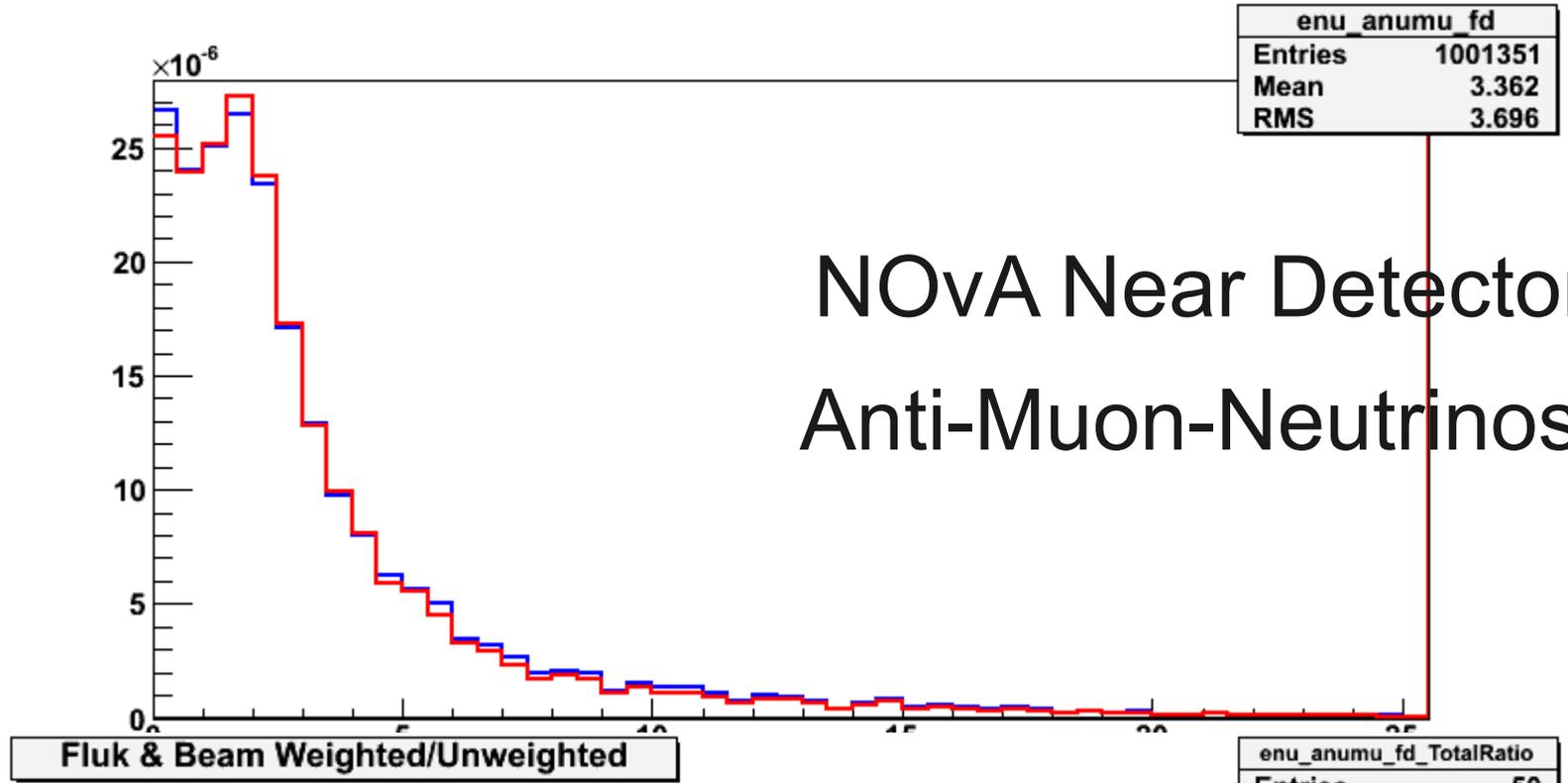
NOvA Near Detector Anti-Muon-Neutrinos



NOvA Far Detector Muon-Neutrinos



NOvA Near Detector Anti-Muon-Neutrinos



Conclusions/Outlook

- SKZP package shows consistency with original MINOS implementation
- We have beamline weights for NOvA
- Uploading to CVS soon
- jseldred@email.wm.edu

Back-up slides...

What is SKZP? (repeat slide)

- Re-weights events in the beam-line model to reflect best-fit parameters from MINOS running in a variety of beam configurations.
- Using this tuning procedure to look at the off-axis flux at NOvA from on-axis MINOS info.
- We can use this to re-weight the beamline model in light of NOvA data (when we get it.)

Conventions.h

- EparticleType
 - kPiPlus=8, kPiMinus=9, kKPlus=11, kKMinus=12, kK0L=10
- EbeamSys
 - kHornMiscal=1, kHornDist=2
- EbeamType
 - kLE=1, kLE010z185i=2, kLE100z200i=3, kLE250z200i=4, kLE010z185iL=5, kLE010z170i=6, kLE010z200i=7, kLE010z000i=8, kLE150z200i=9
- EdetType
 - kNOvAnd=1, kNOvAfd=2, kIPND=3, kMINOSnd=4, kMINOSfd=5, kNOvArat=6, kNOvArat=7