

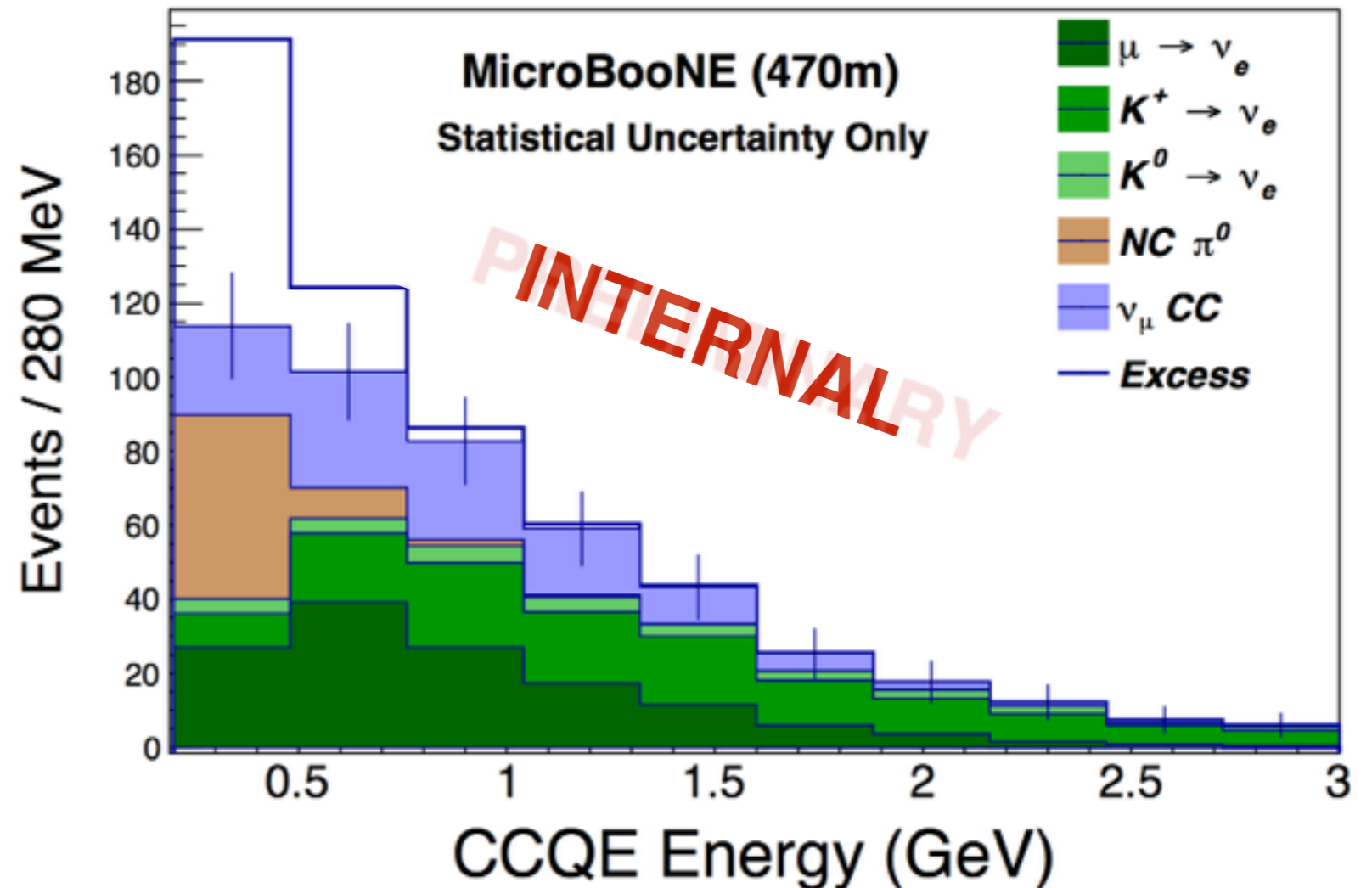
Osc Group Update

Bryce and Georgia
10/10/2014

Start where we ended last meeting...

- David Kaleko, DocDB 3640

- Generate single uB e/ γ MC dataset based on published final uBooNE results
- Run through a truth-based event selection
- Stack new excess prediction on updated uB backgrounds, which have gone through the same selection



Stat significance: Signal/sqrt(bkgrd) in the first bin is $75/\sqrt{117}$, which is 6.9 sigma
Signal/sqrt(bkgrd) for the first 2 bins combined is 6.7 sigma

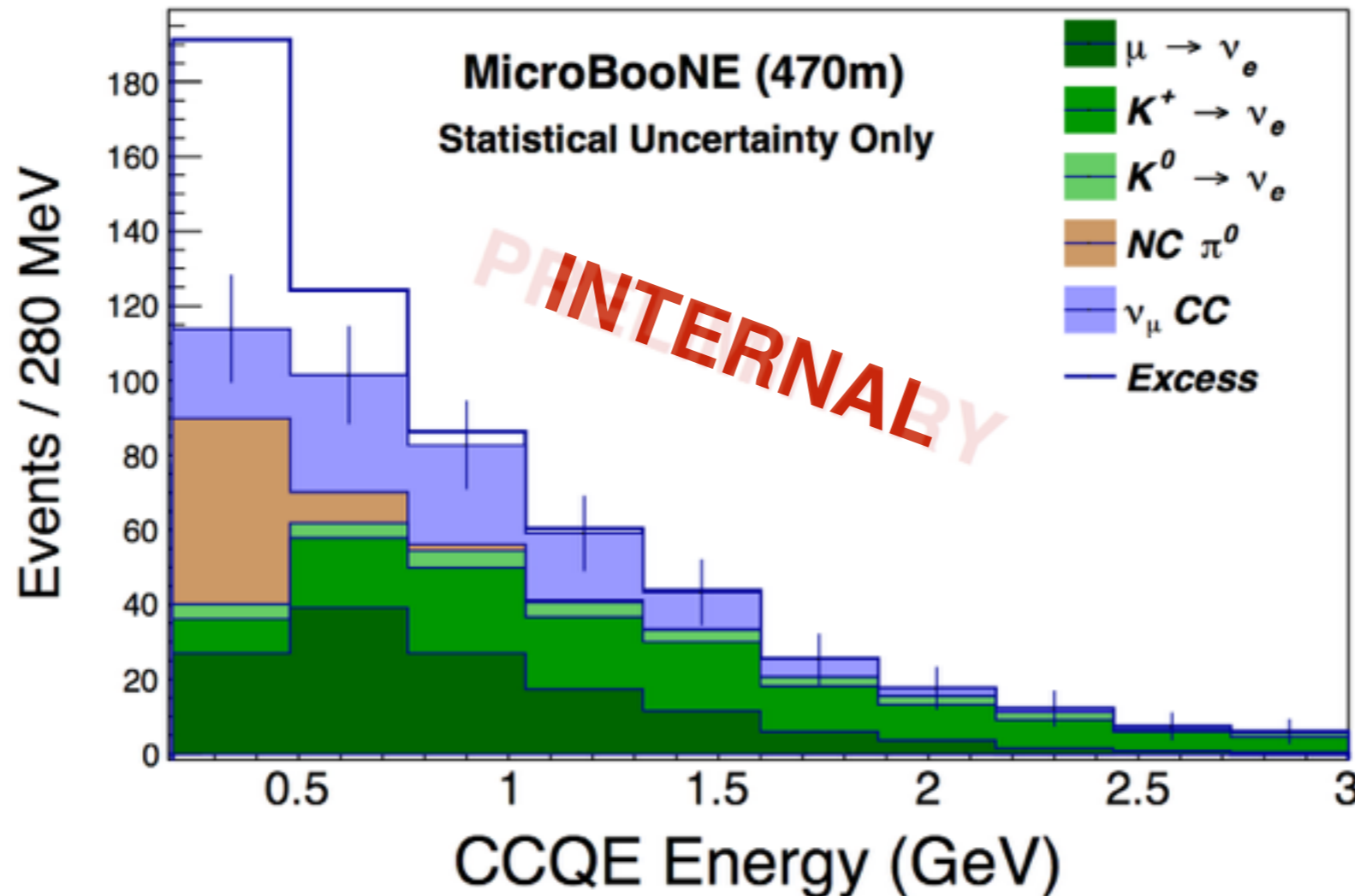
Improvements, Extensions

Nue app Improvements

Missing a
background:
cosmics

Missing a
background:
dirt (Beam WG)

Use
Reconstructed
MC; not truth!



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Osc Extensions

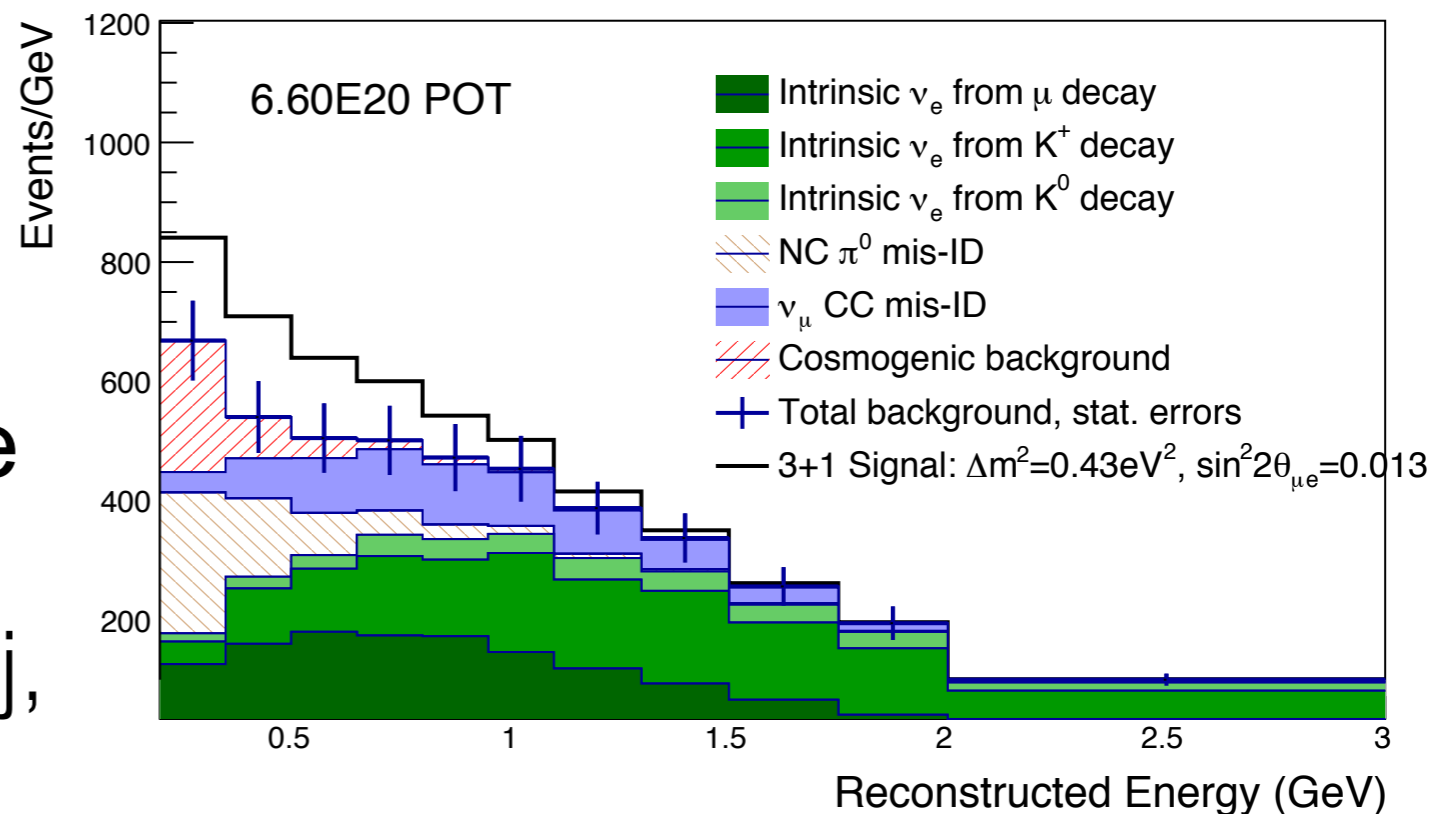
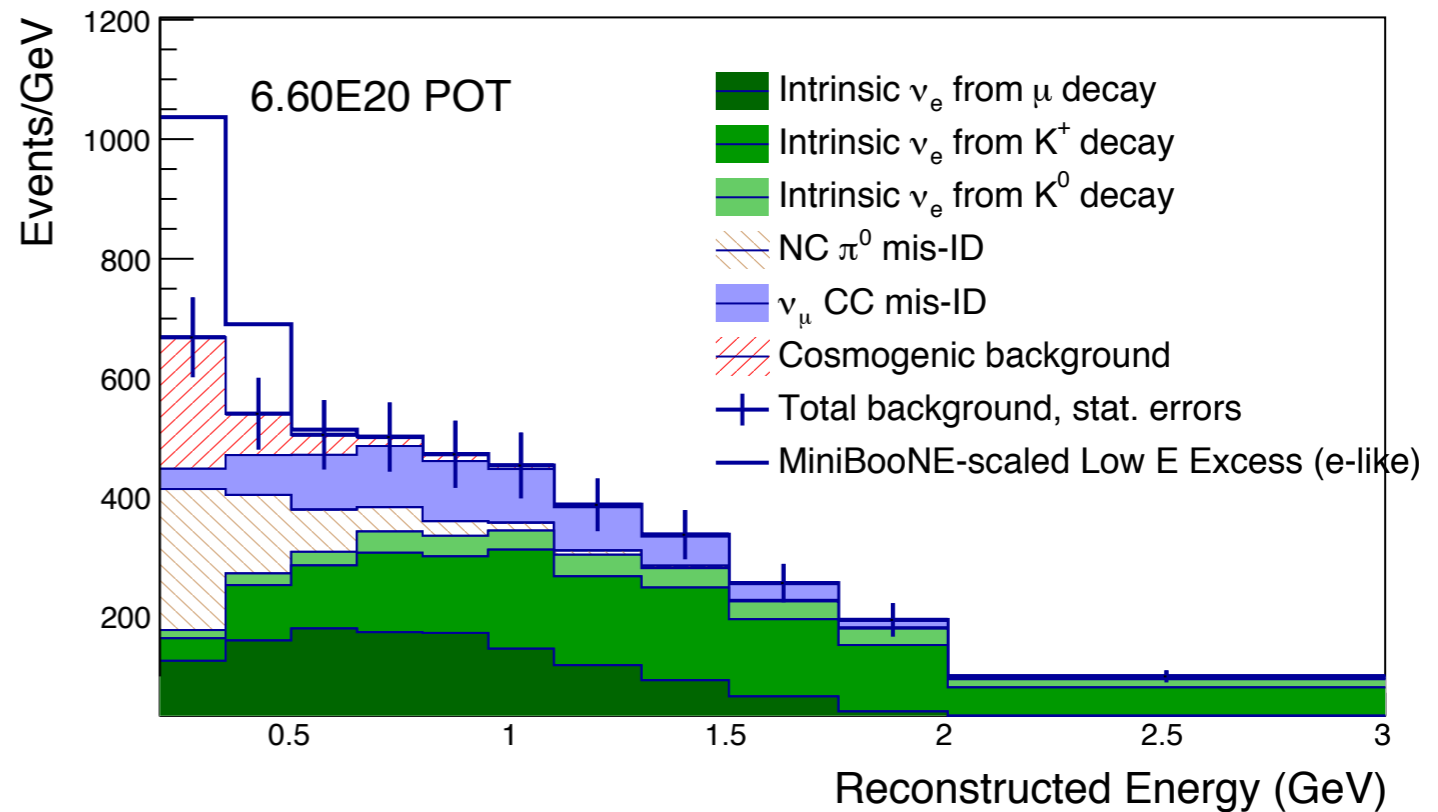
Define nearer-term
sensitivity, if any?

Progress on other
actively-pursued
app/dis analyses?

What if excess is
gamma-like?

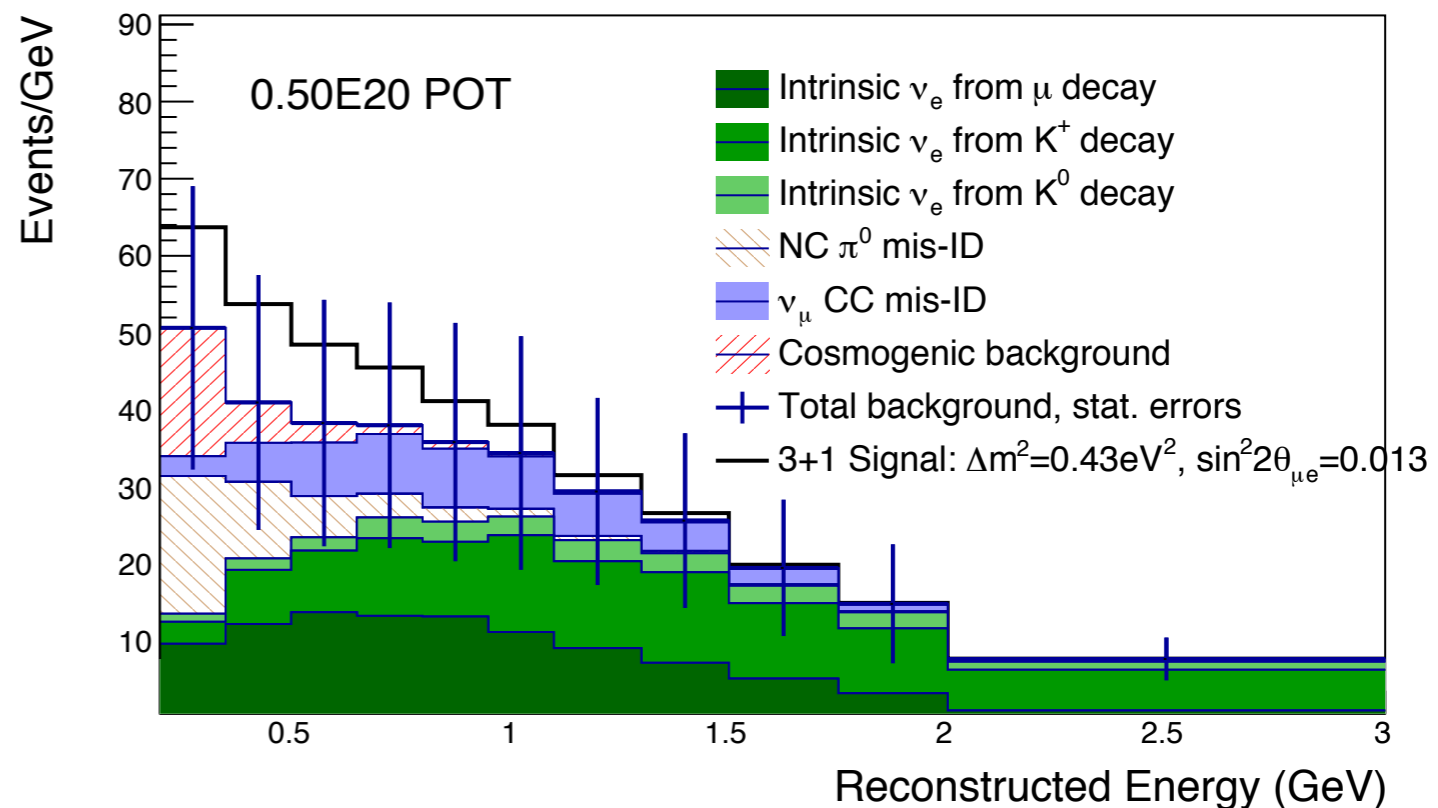
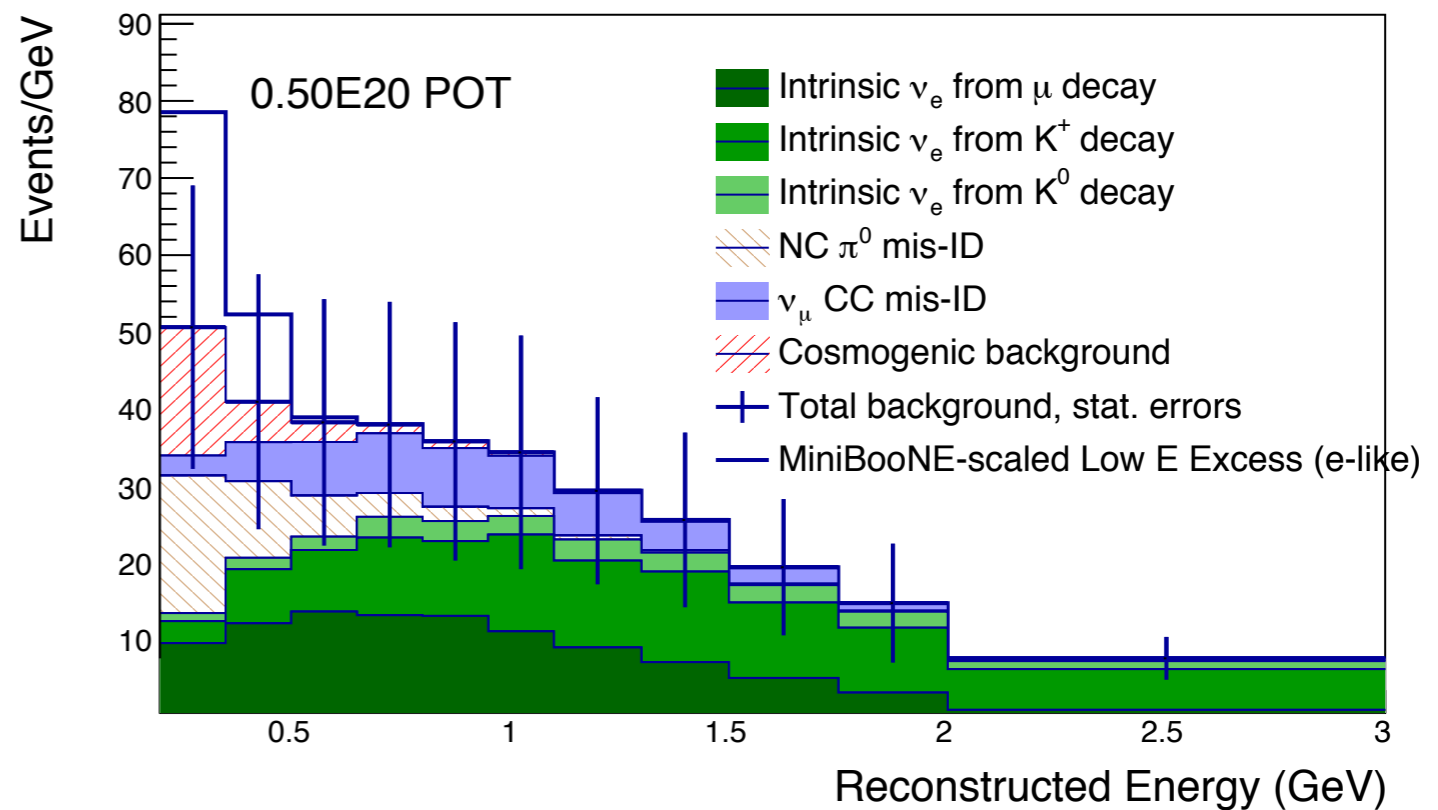
Adding Cosmic Background

- September: add cosmic bkg to these plots
 - Done with Christoph's CRY-based estimates of primary cosmic gammas
 - We now know that uB backgrounds will likely not be primary gammas, but secondaries
 - Plan to re-do these calculations with guidance from cosmics task force
 - Working on making similar plots for gamma-like excess
- Georgia, Cristoph, Andrzej,
David K, Corey



Nearer-Term Sensitivity

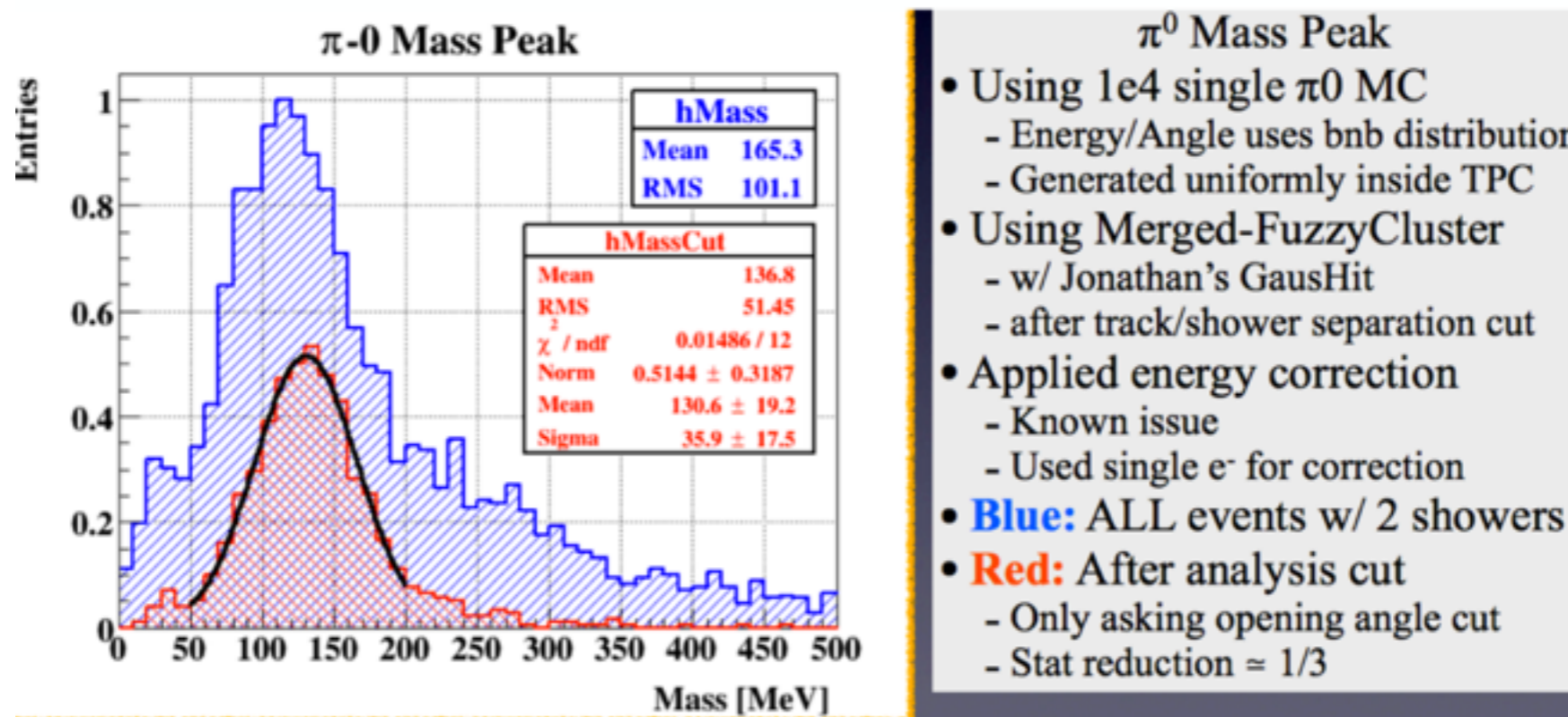
- Have plots defining the e-like excess for a few models, given 0.5e20 POT
 - Defines what e-like excess measurement significance might be in the short-term
- Plots made by Georgia, using bkg inputs from Corey and Christoph



Georgia, Cristoph, Andrzej,
David K, Corey

Use Reconstruction!

- As previously mentioned, major advances in shower reco
 - Shower direction, momentum reconstruction getting advanced enough to produce π^0 mass peaks from single generated π^0 's.



- Have discussed viability of producing single-shower reco efficiencies and gamma and numucc mis-ids with shower reco experts
- Getting closer to proof-of-principle reco-based efficiency, mis-id numbers
- If Osc folks are interested in digging into reco for e-like efficiencies, numucc mis-id, see Kazu, etc!

Kazu, Andrzej, David K, David C, Ryan, Ariana, Corey, others!

Other App/Dis measurements?

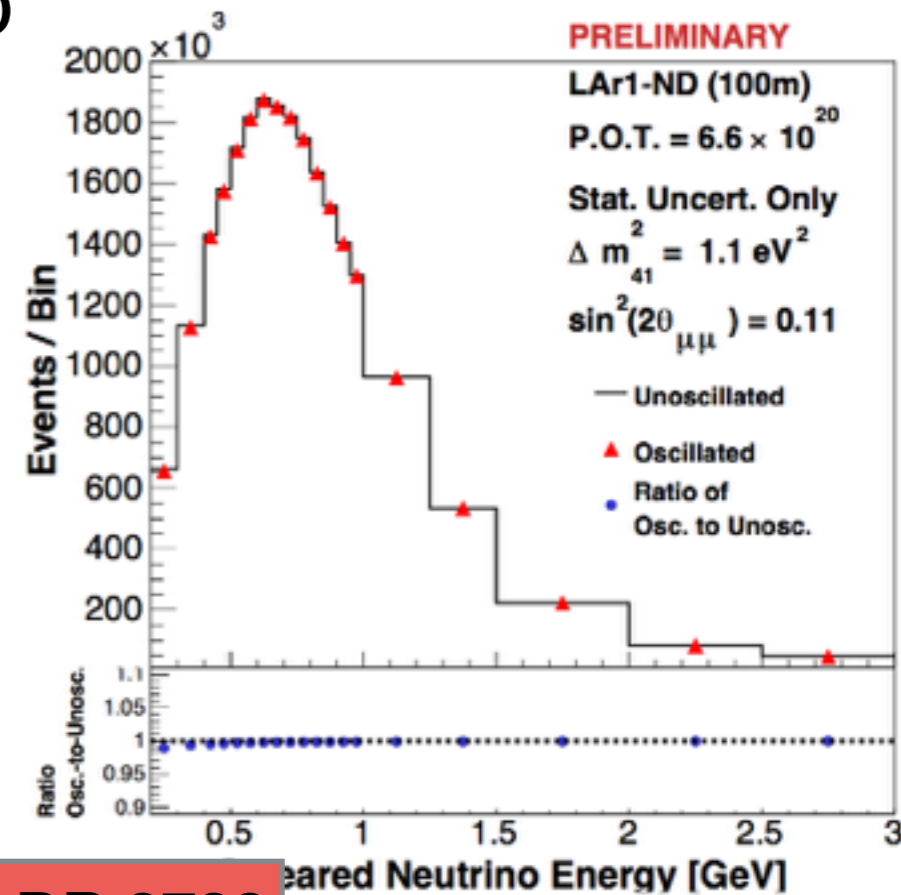
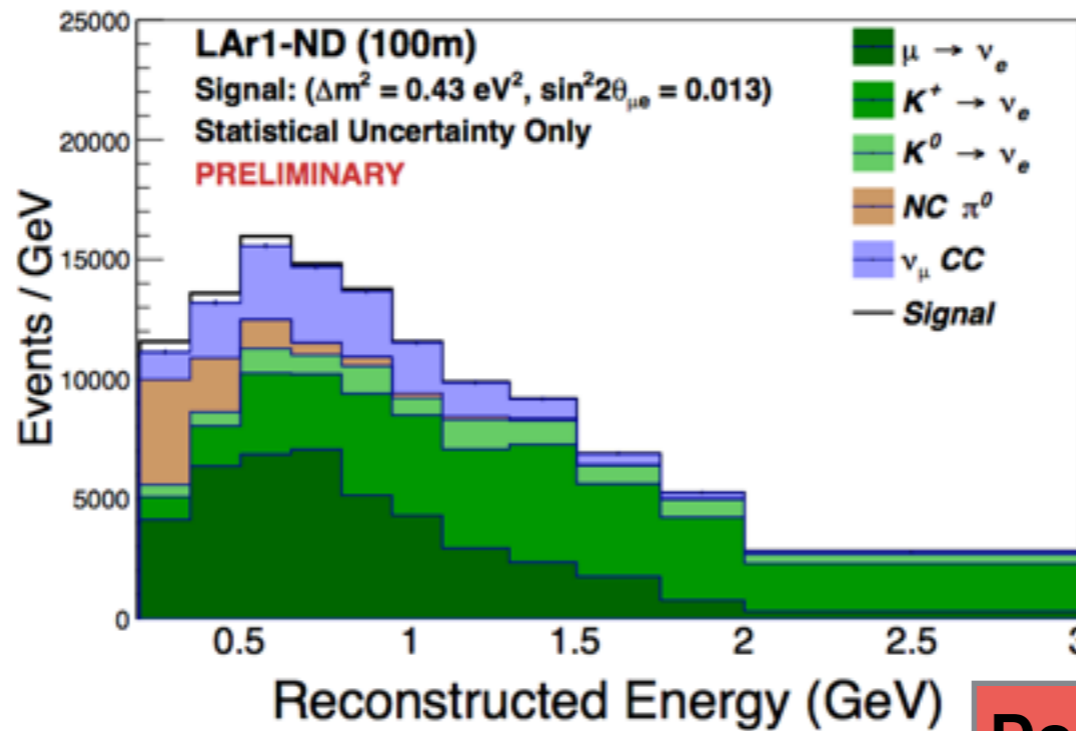
- New tech-note detailing numu dis, nue app from SBL physics folks: relevant to uB osc

- Gives 3+1 sensitivities for different analyses for uB-only, uB+LAr1-ND, Full SBL

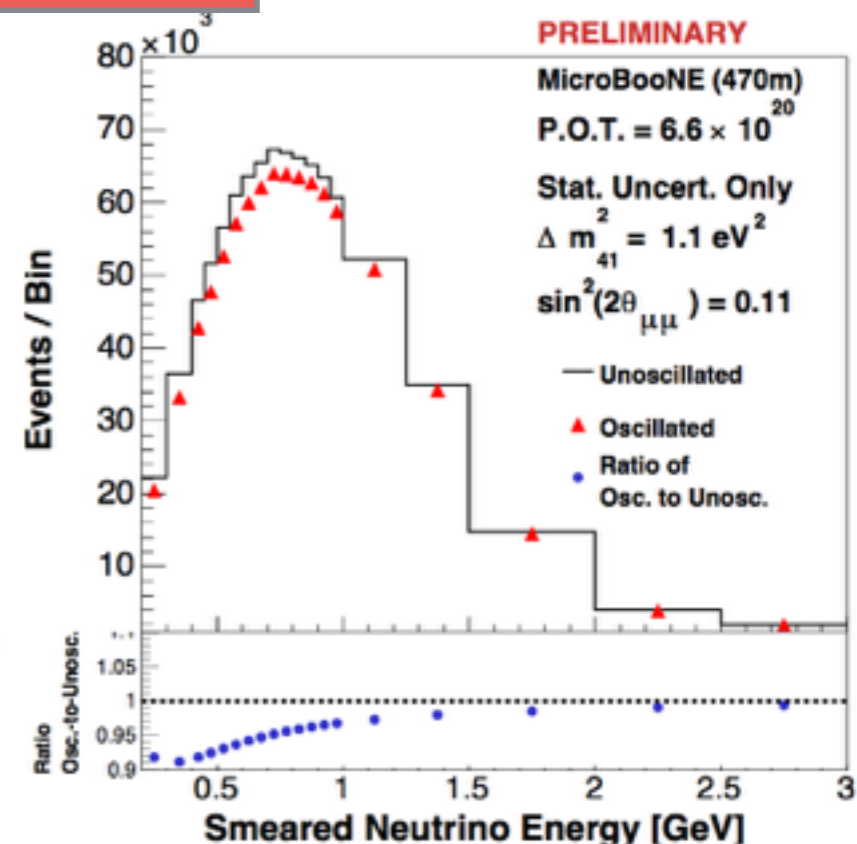
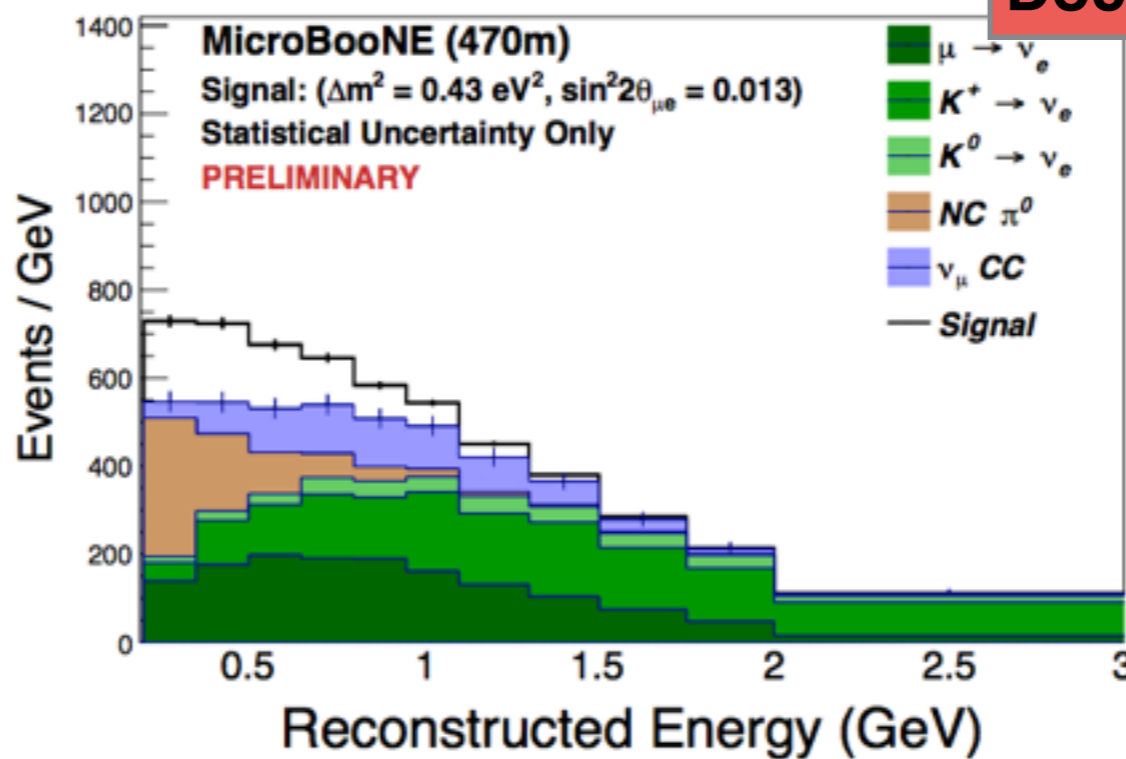
- Significant work on x-section uncertainties underway

- Please give feedback on TechNote!

- Also looking at signal injection plots (Davio)



DocDB 3732



Corey, Joseph

Best Ways to Get Involved?

- Talk to me and Georgia!
 - We will also be making the rounds to find interested people
- Join the reconstruction effort!
 - Talk to Kazu! He knows the reco status, and how to plug in
 - Talk to Georgia or myself for suggestions about good ideas for osc-related reconstruction studies
- Engage with groups estimating backgrounds!
 - Cosmics sub-group studies are very relevant to osc group
 - Beam dirt backgrounds need to be well-understood for uB unique case