NuMI in MicroBooNE Update

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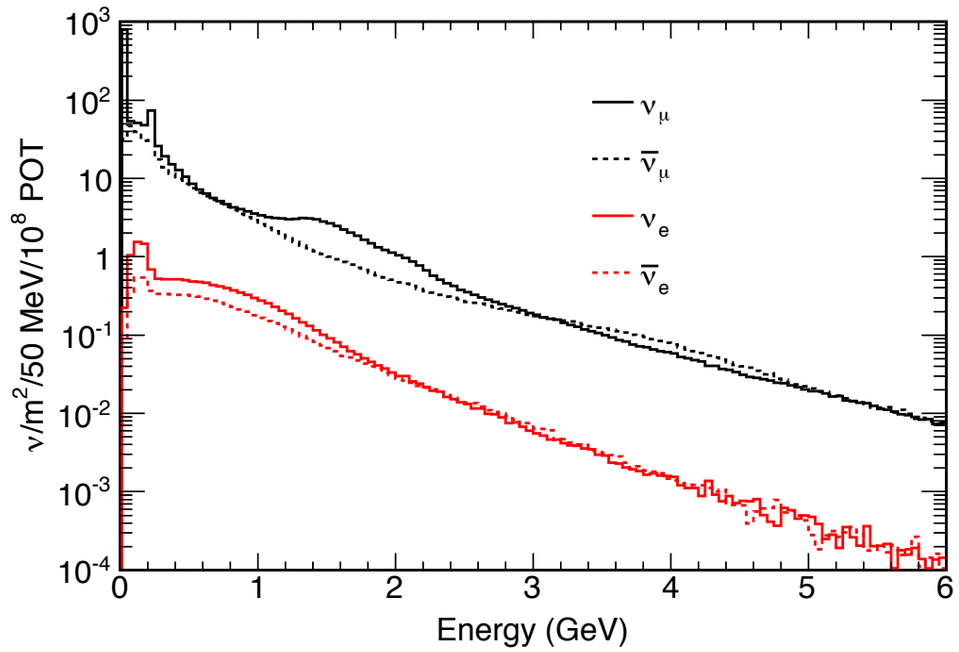
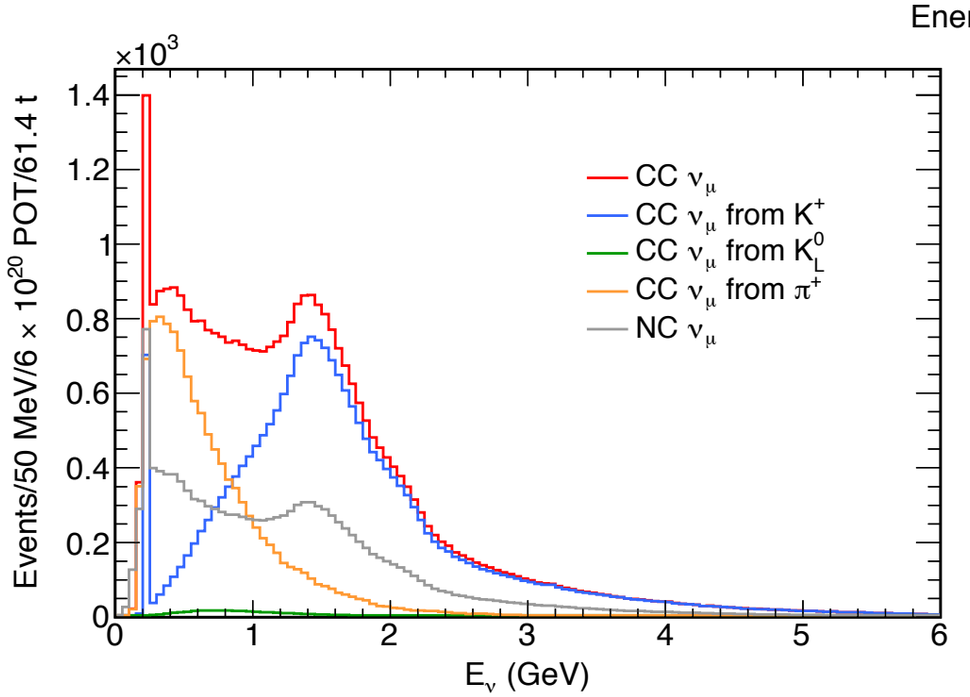
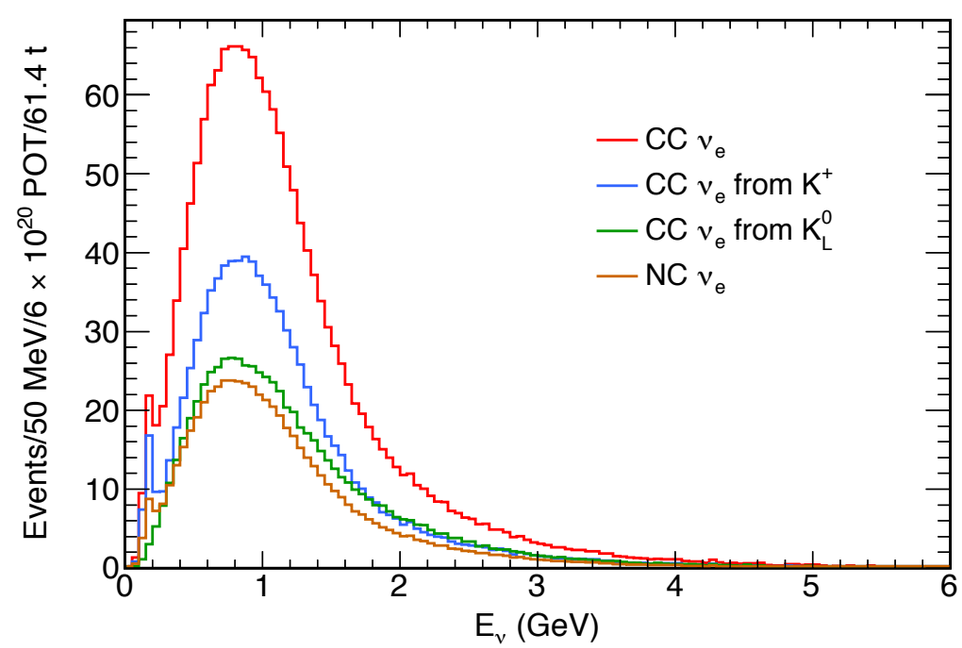
Quick Reminder

A few weeks ago, preliminary event rate study for NuMI, just using flux and GENIE cross section splines. Also describes using flux windows

- http://home.fnal.gov/~ddavis/numi_uboone/numi_evrate/Prelim.pdf

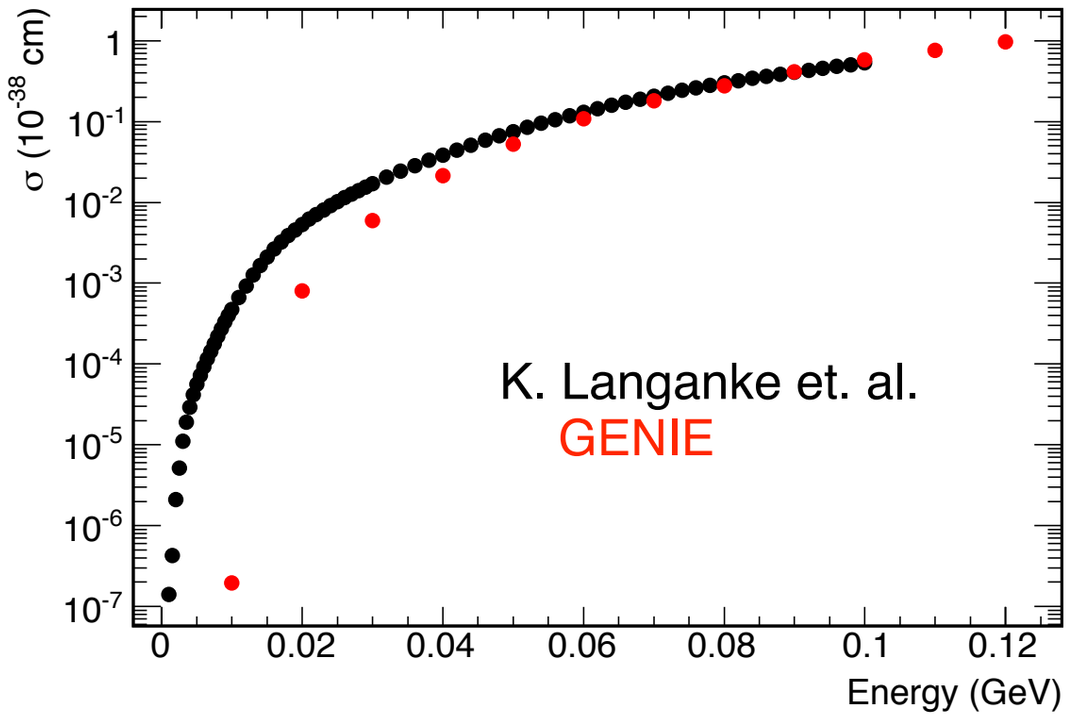




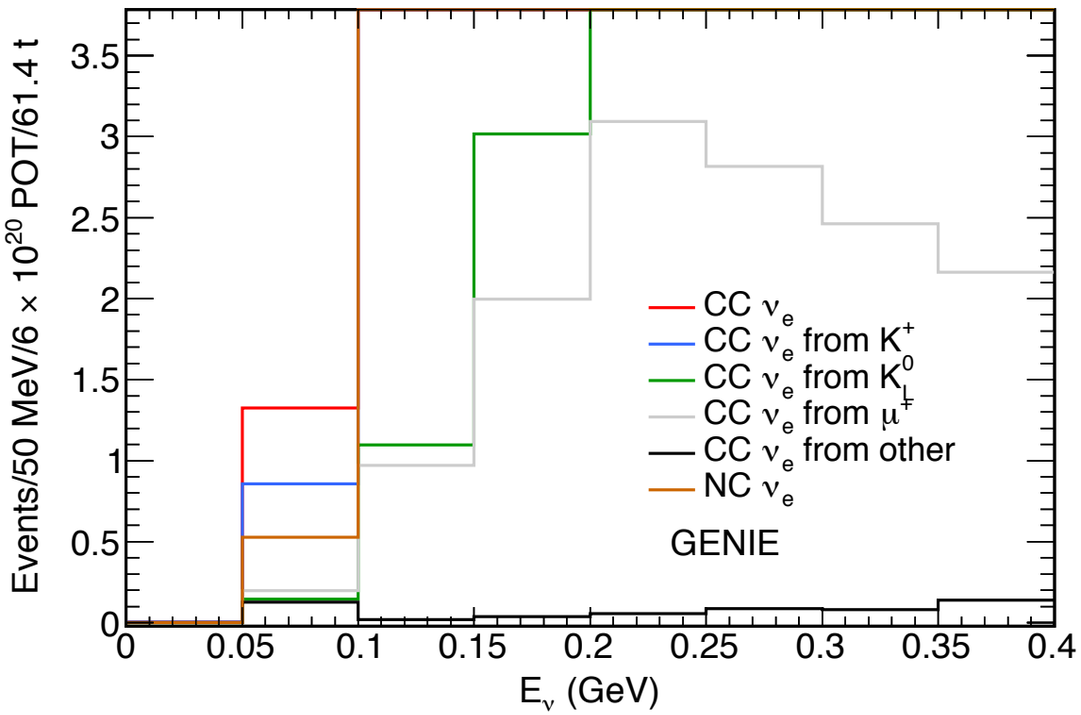


Low Energy Cross Section Fix

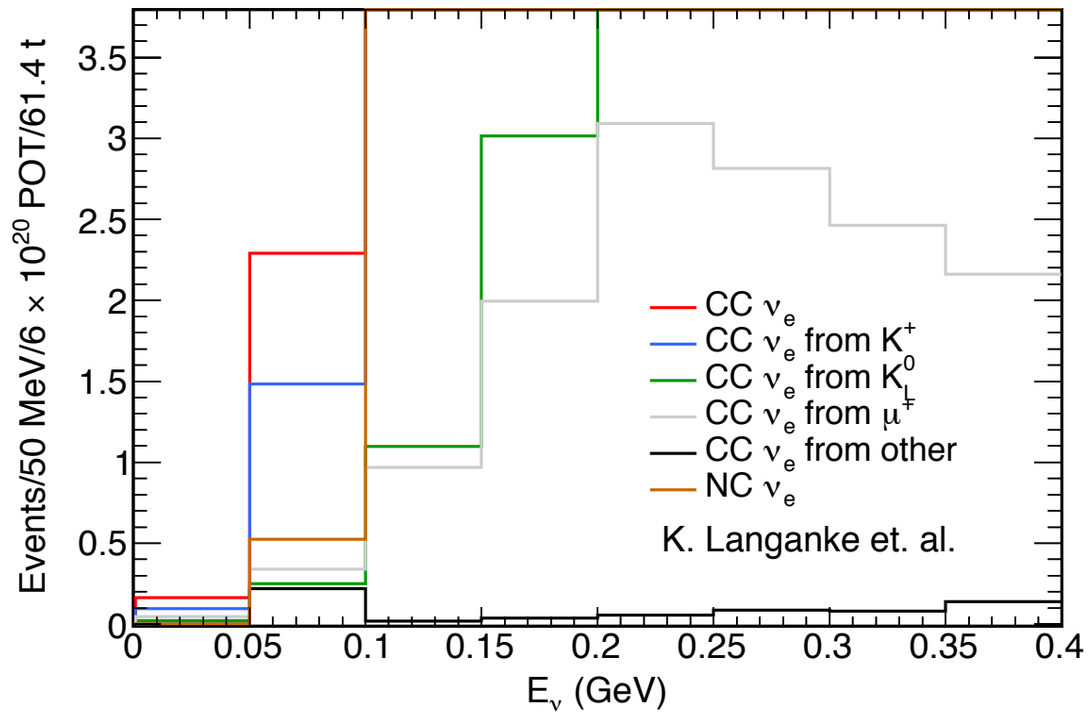
- I was given some new electron neutrino cross section data from Flavio, through Roxanne. This data comes from a theoretical paper by K. Langanke et. al.



1.33 events < 100 MeV

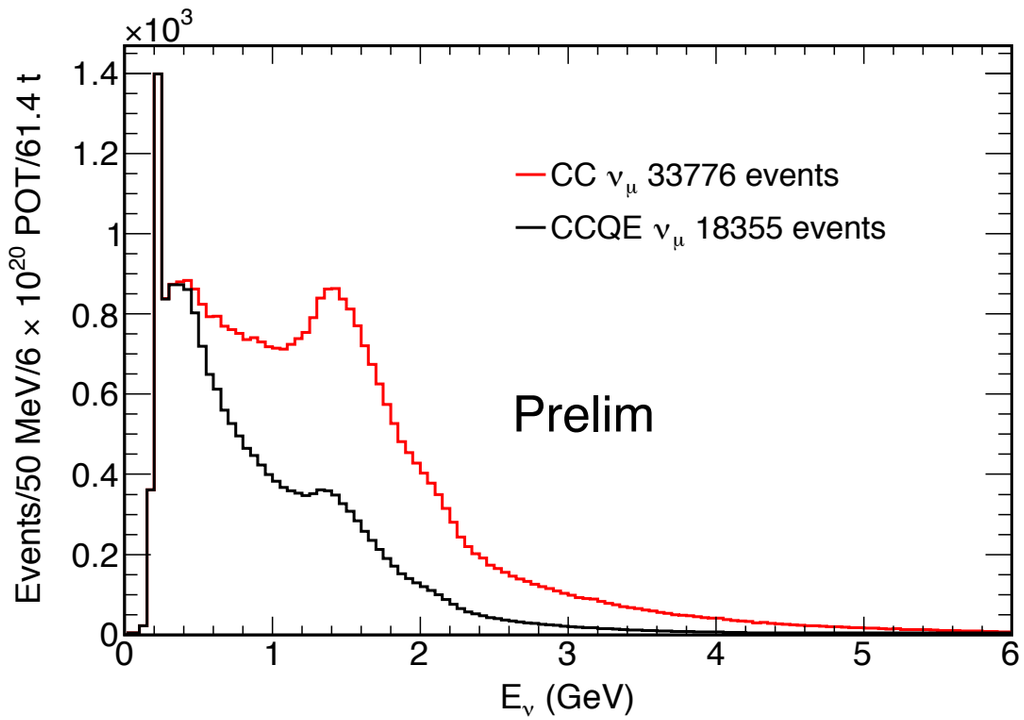


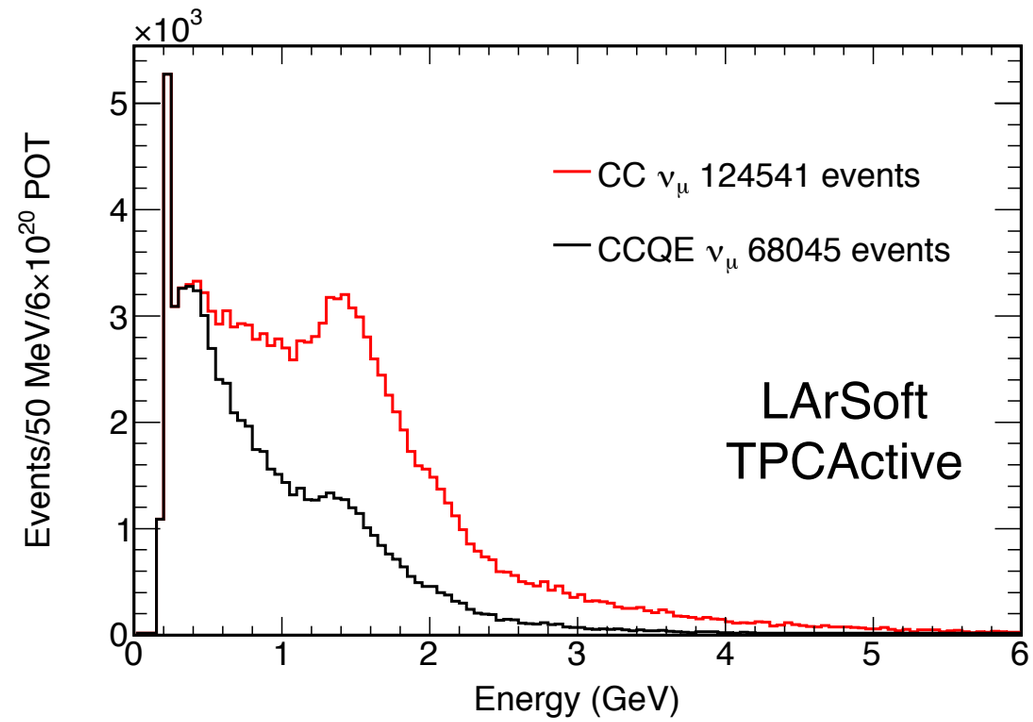
2.46 events < 100 MeV

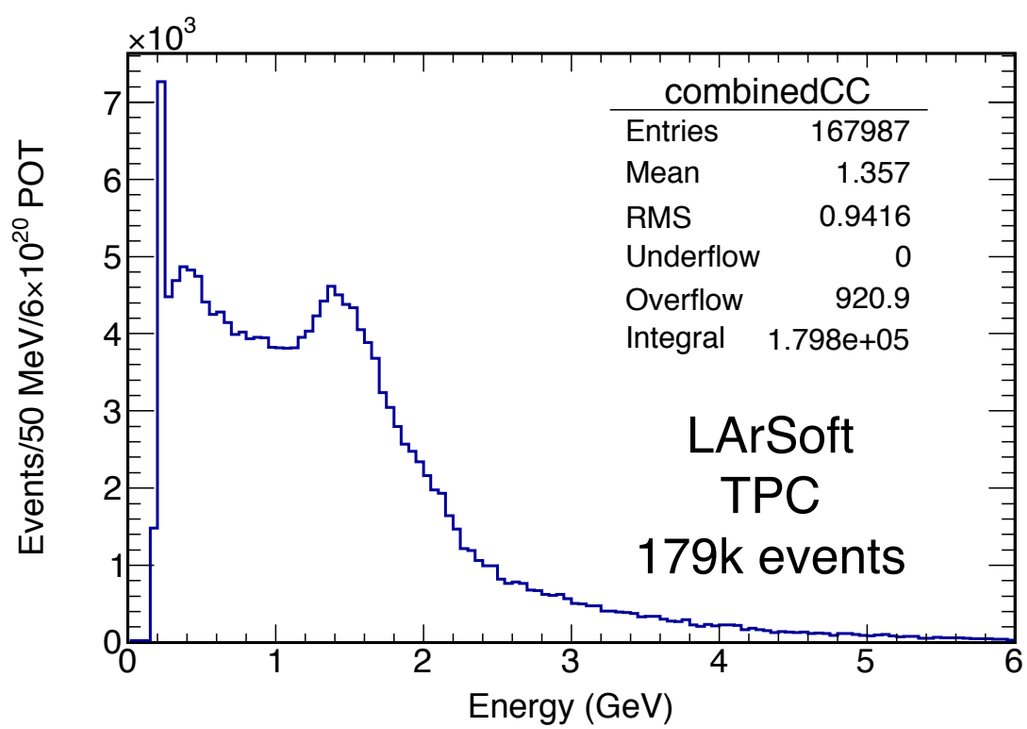


Status of LArSoft Event Rate Work

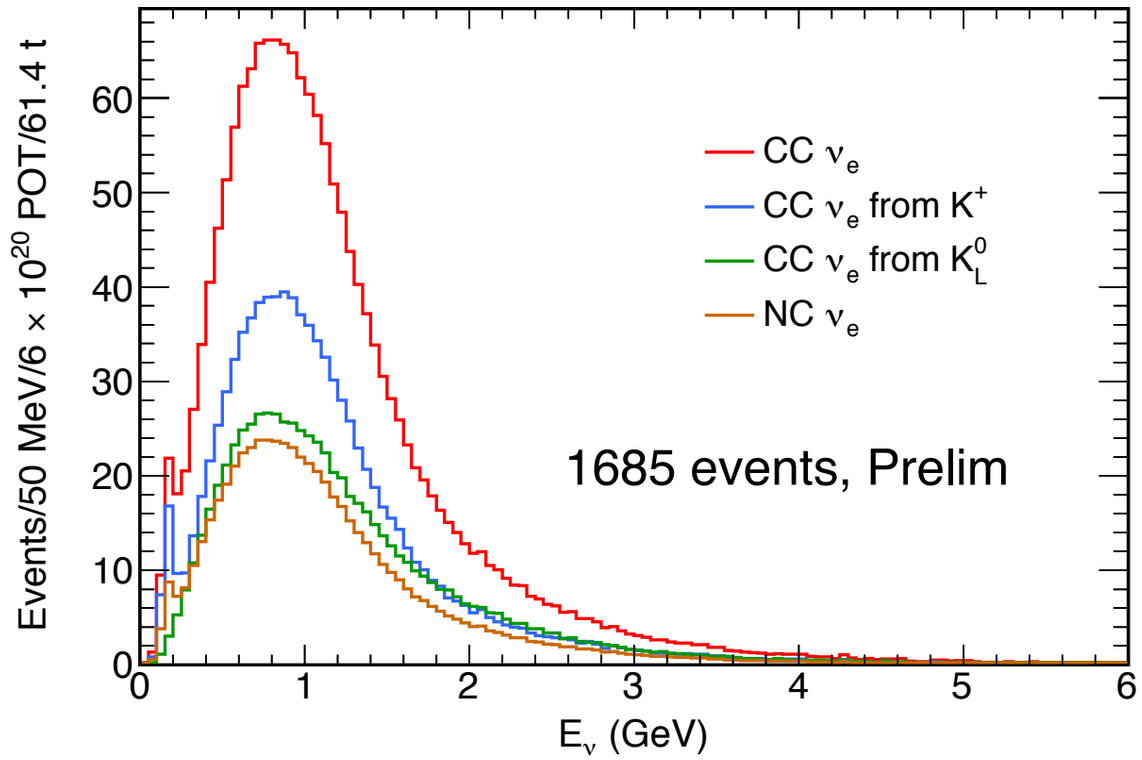
Ongoing normalization problem

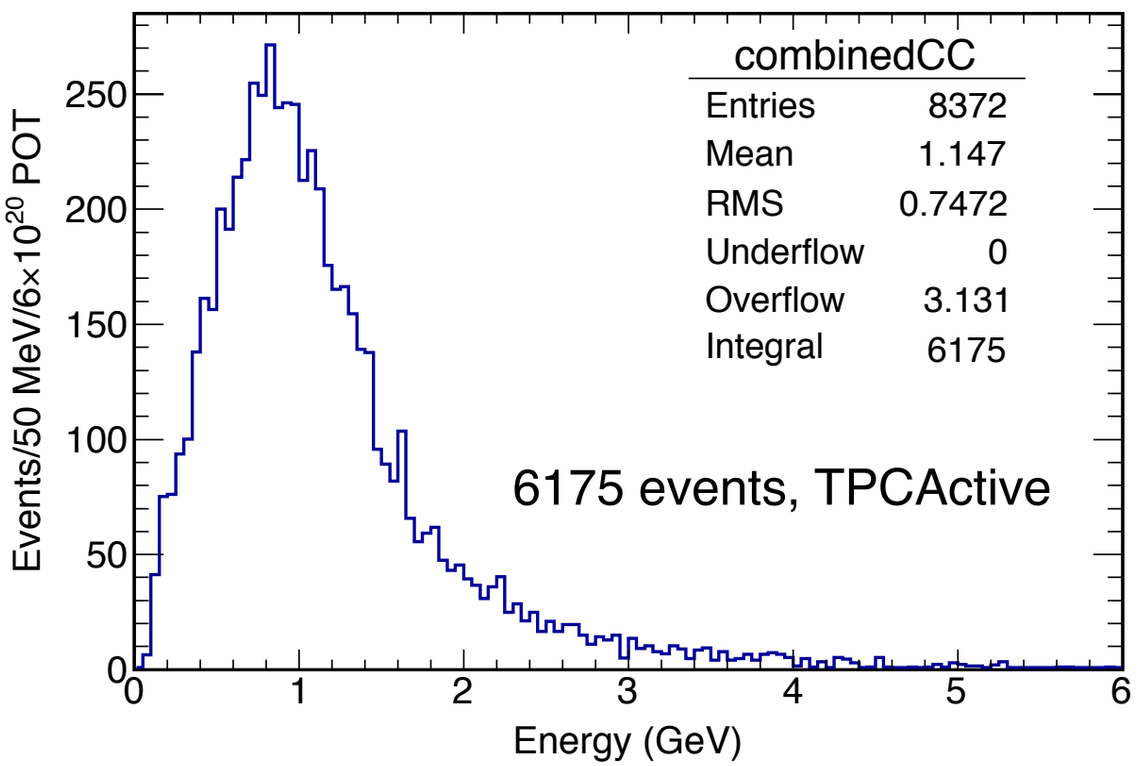


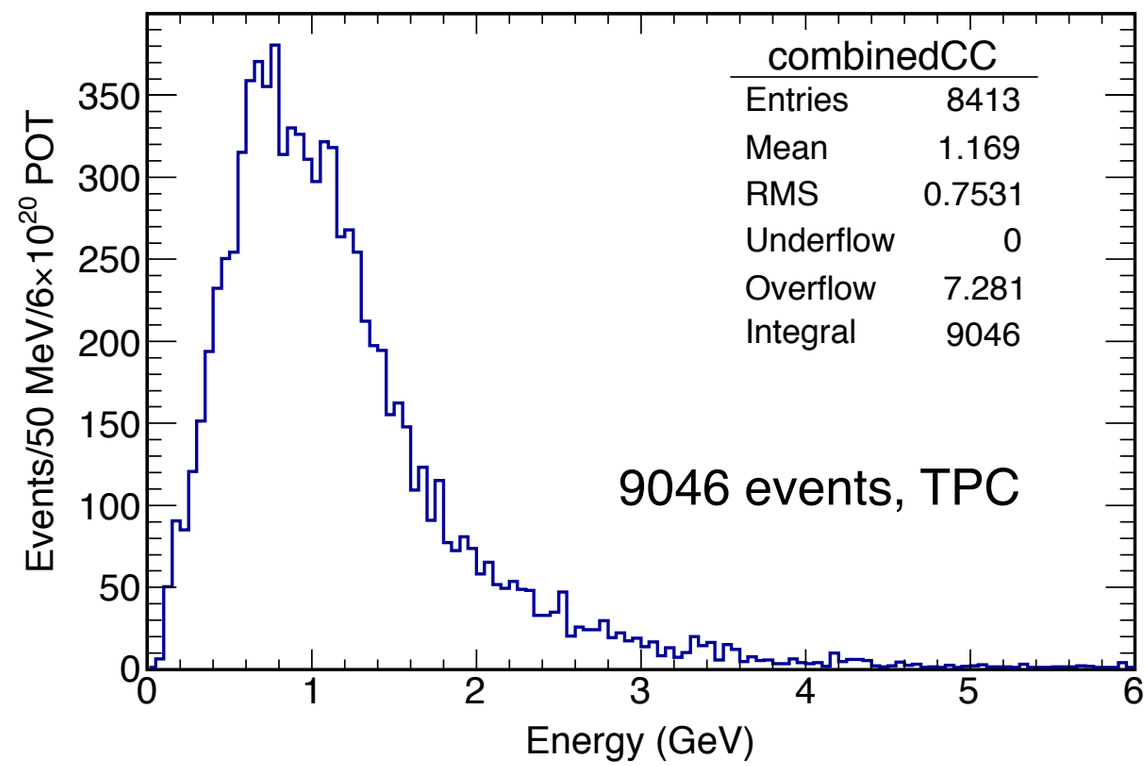




Continued


Events/50 MeV/6 × 10^20 POT/61.4 t
CC νe
CC νe from K+
CC νe from K0L
NC νe
1685 events, Prelim
Eν (GeV)

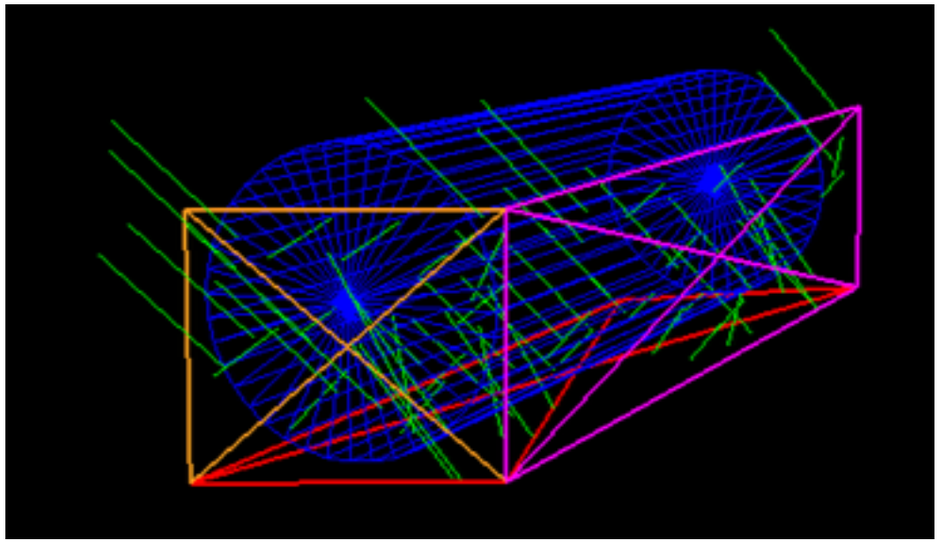

Events/50 MeV/6×10^20 POT
combinedCC
Entries 8372
Mean 1.147
RMS 0.7472
Underflow 0
Overflow 3.131
Integral 6175
6175 events, TPCActive
Energy (GeV)


Events/50 MeV/6×10^20 POT
combinedCC
Entries 8413
Mean 1.169
RMS 0.7531
Underflow 0
Overflow 7.281
Integral 9046
9046 events, TPC
Energy (GeV)

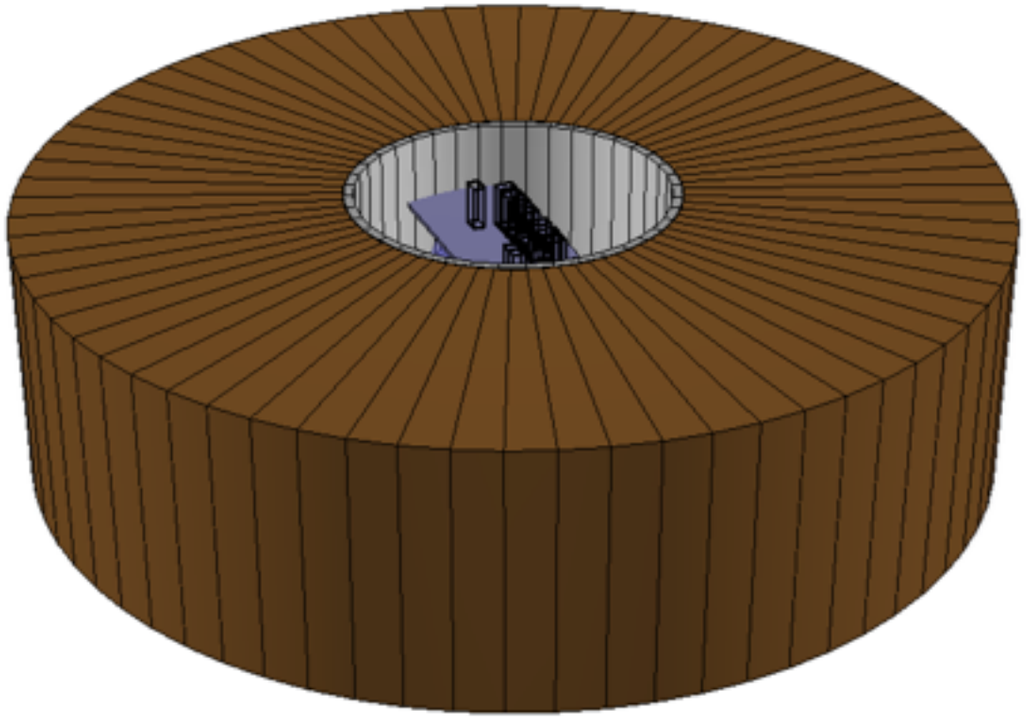
Process

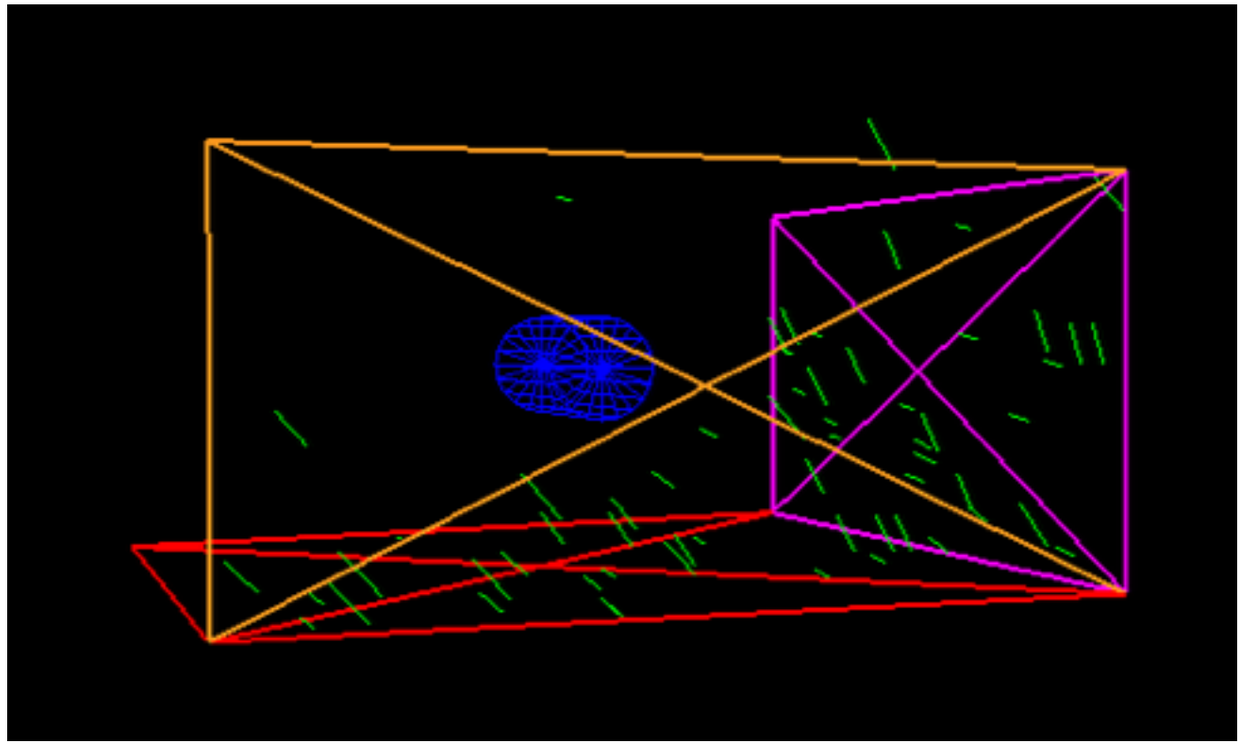
- For the preliminary work, I simply counted the flux on each window, normalized to a single square meter and POT, multiplied by cross section, added the windows three together, and scaled with the 61.4 t FV.
- For the LArSoft study, I am normalizing each window to desired POT (just scaling by Desired POT/total POT) and adding them.

Dirt Update



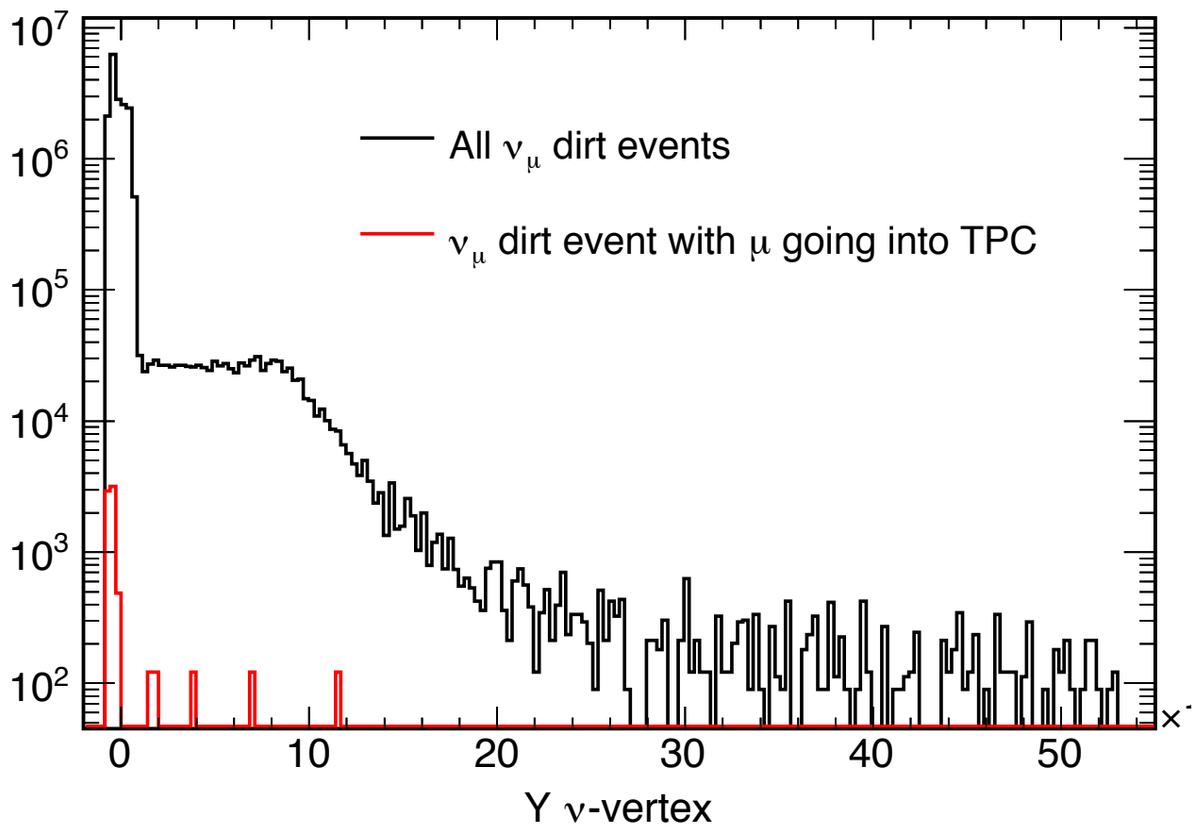
- Top Left: Flux windows for generating NuMI events in the TPC.
- Bottom Left: MicroBooNE geometry volWorld.
- Bottom Right: Flux windows for generating NuMI events in volWorld
- Zarko is working on BNB dirt Events

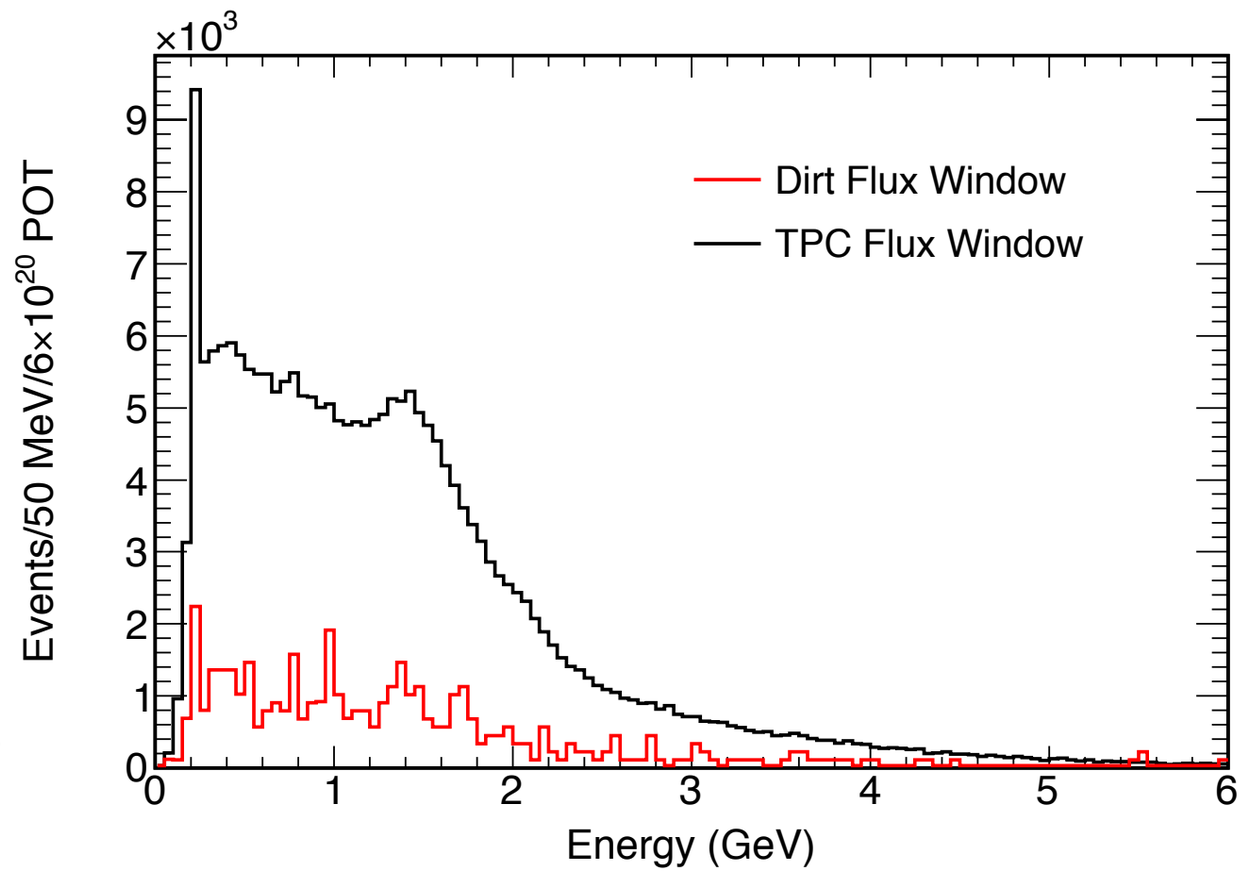




Dirt Update

Once the normalization issue is fixed, I will get the dirt event rate locked down as well, but in the mean time I have looked at dirt event a bit.





Since this find, more geometry has been added below the detector

Constrained to events occurring inside TPC, histograms should overlap