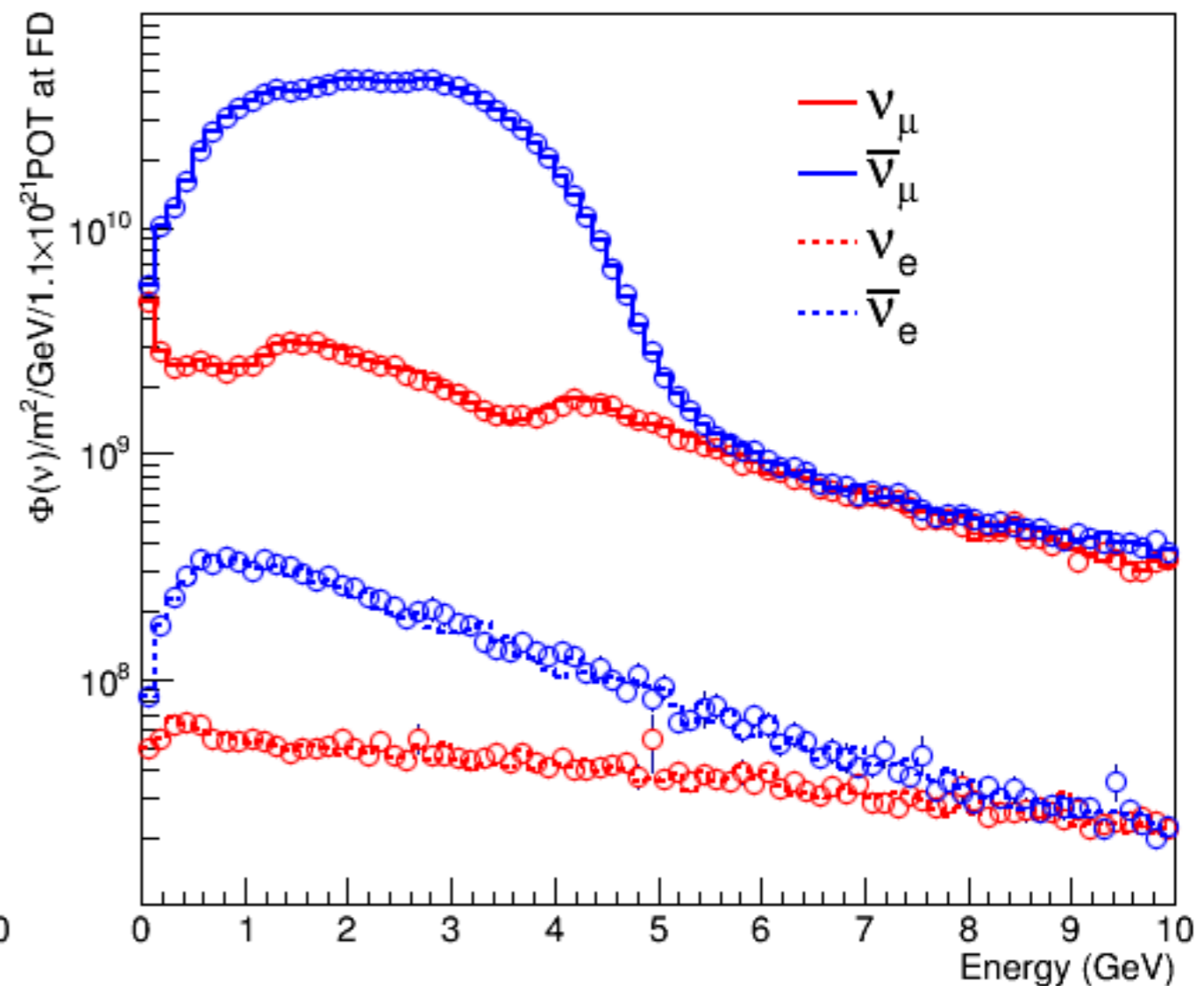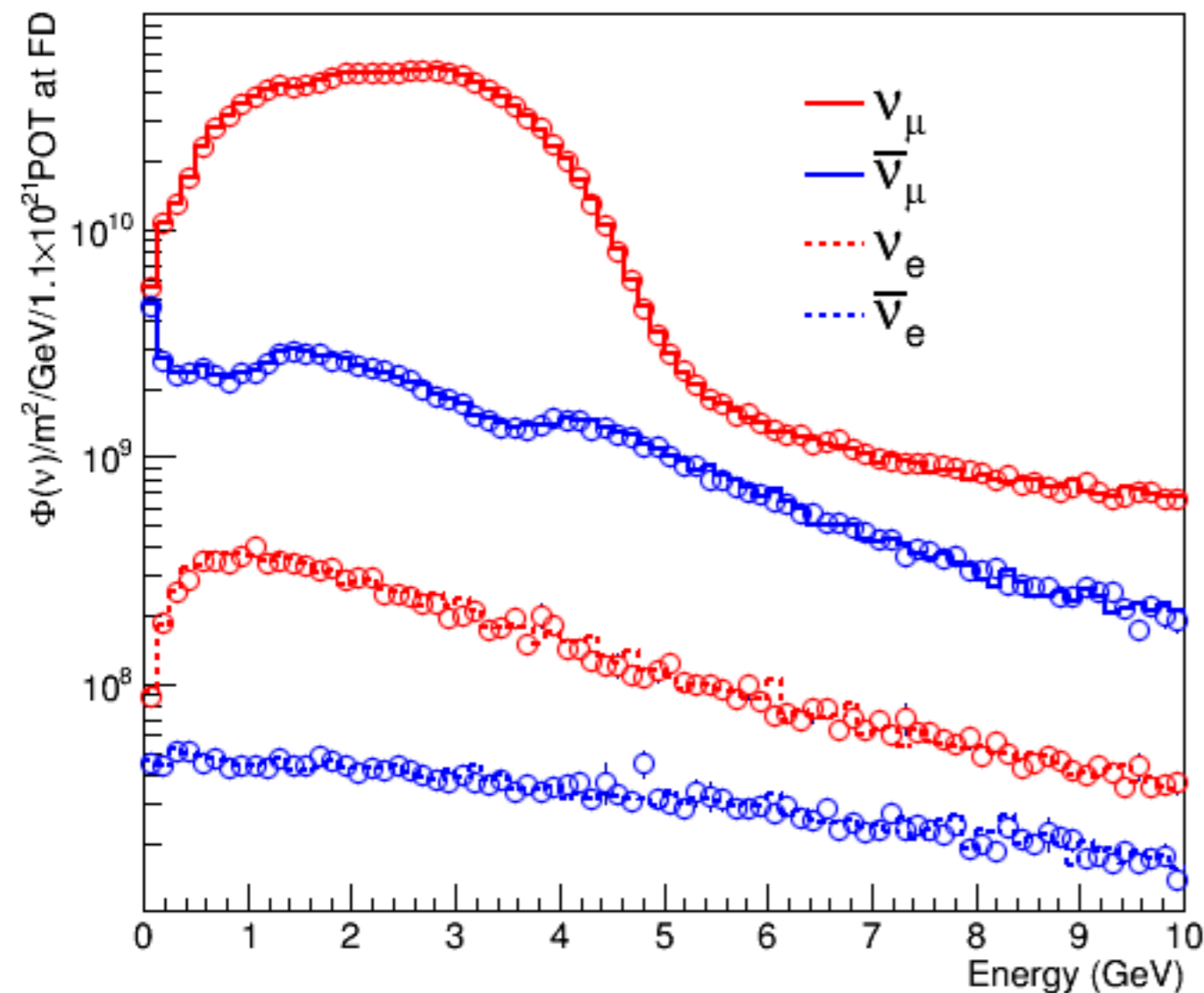# Flux plots update

Žarko Pavlović

g4 version

- g4lbnf setup at Fermilab (and on grid nodes) uses UPS products for geant4, root, dk2nu, …

- v3r5p4 setup against geant4 v4.10.2.p02

- this version of geant4 was removed from ups repository that we use

- bumped up version to the next one available in ups

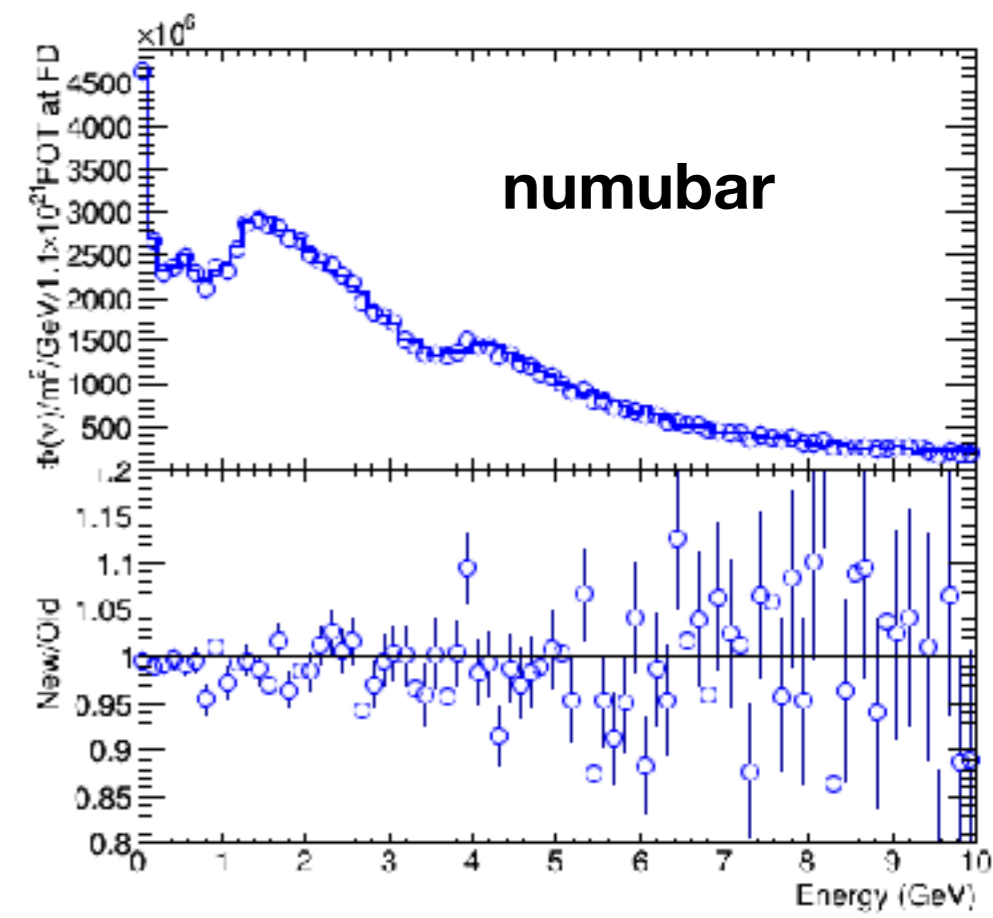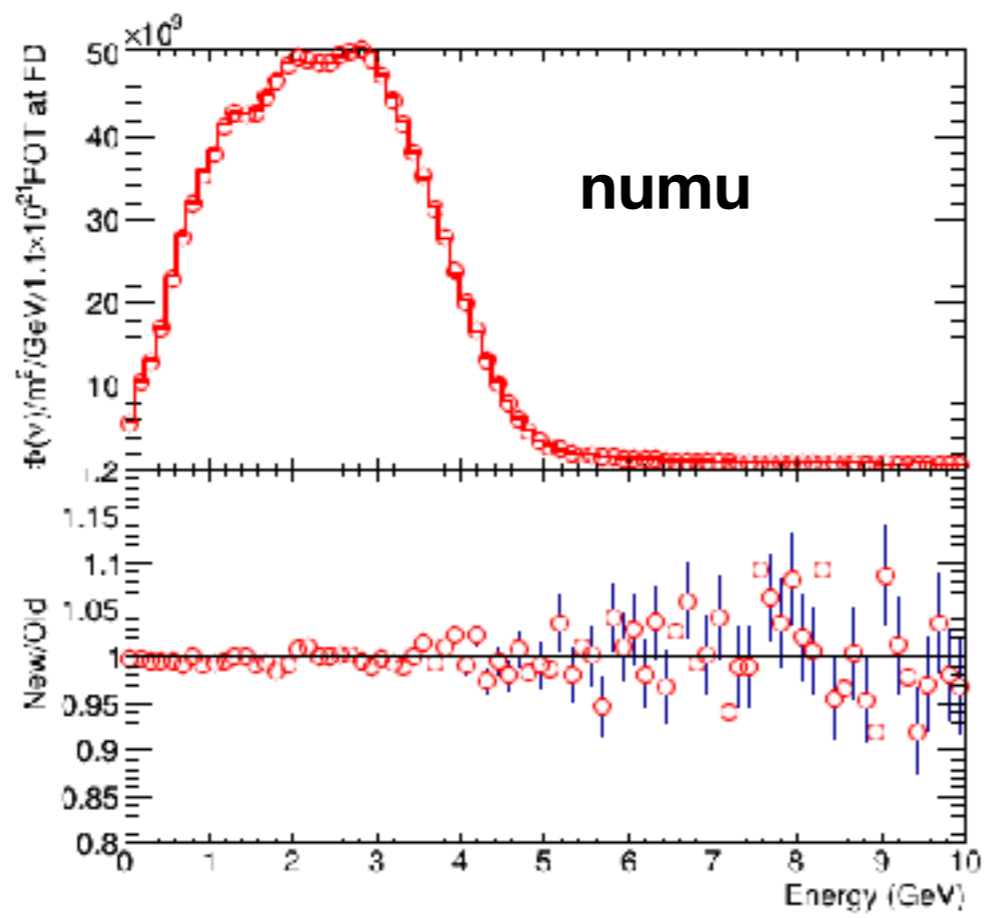- Laura committed required changes and tagged v3r5p5

g4lbne update

- find consistent setup for all products dependencies
  cmake v3_3_2
  geant4 v4_10_3_p03b -q e15:prof
  dk2nu v01_05_01b -q e15:prof

- starting with g4 10.3.3 a new application state was
  introduced in geant4 (G4State_Init)

  - this required update to LBNERunManager.cc to get g4
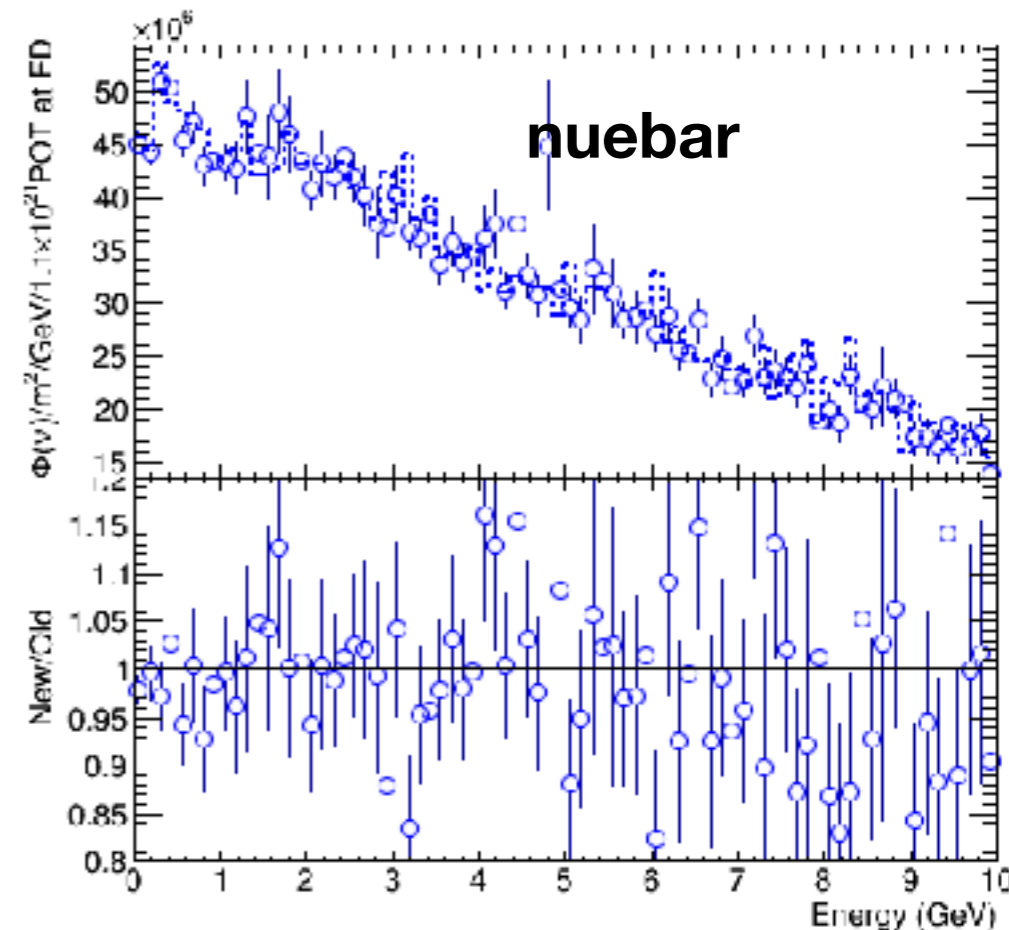   into correct state (G4State_PreInit) when initializing
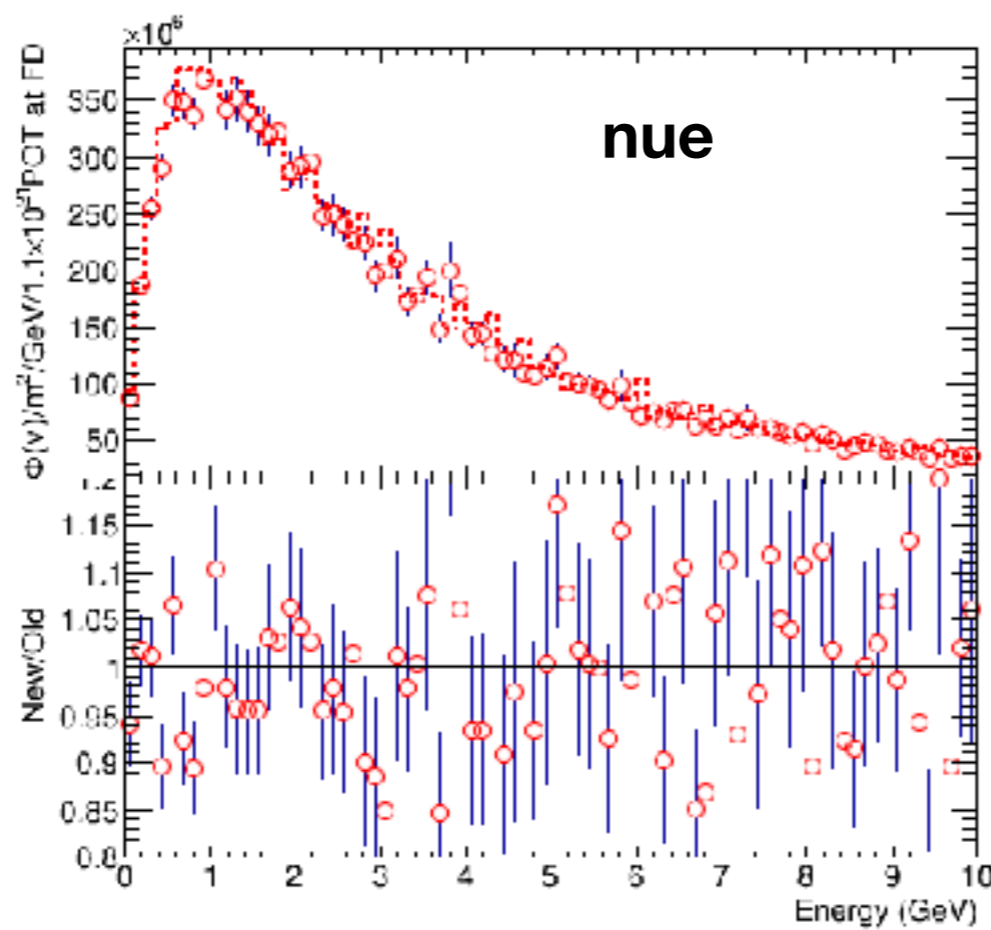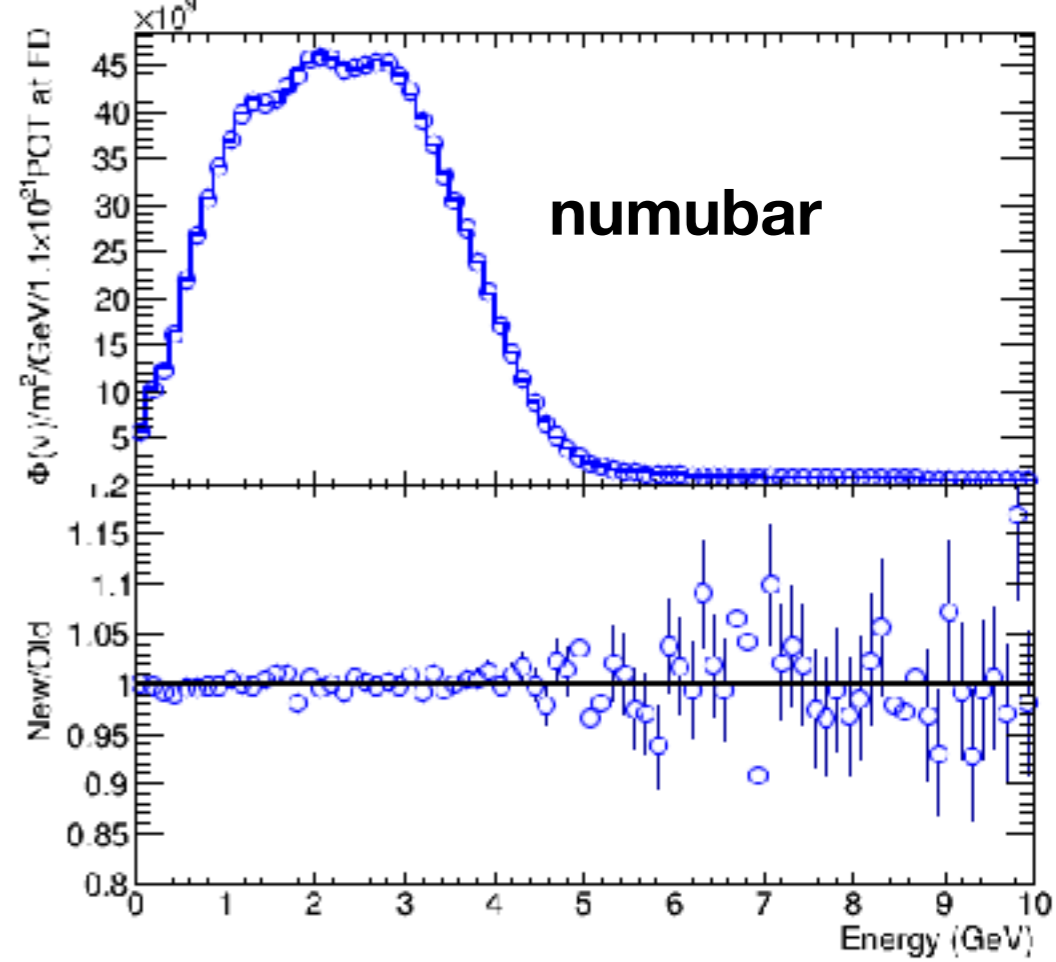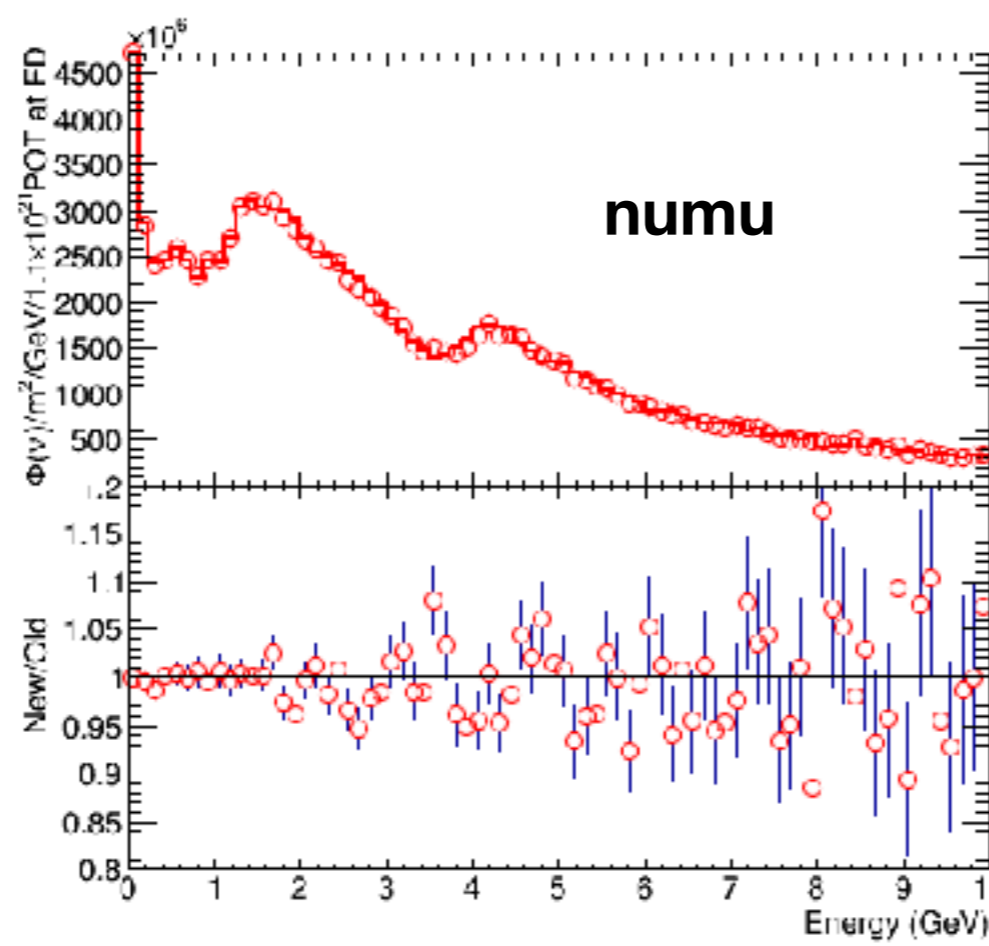   physics

Compare g4 versions

- Neutrino (left) and antineutrino (right) geant4 v4.10.2.p02 (line) vs v4.10.3.p03b (circles)
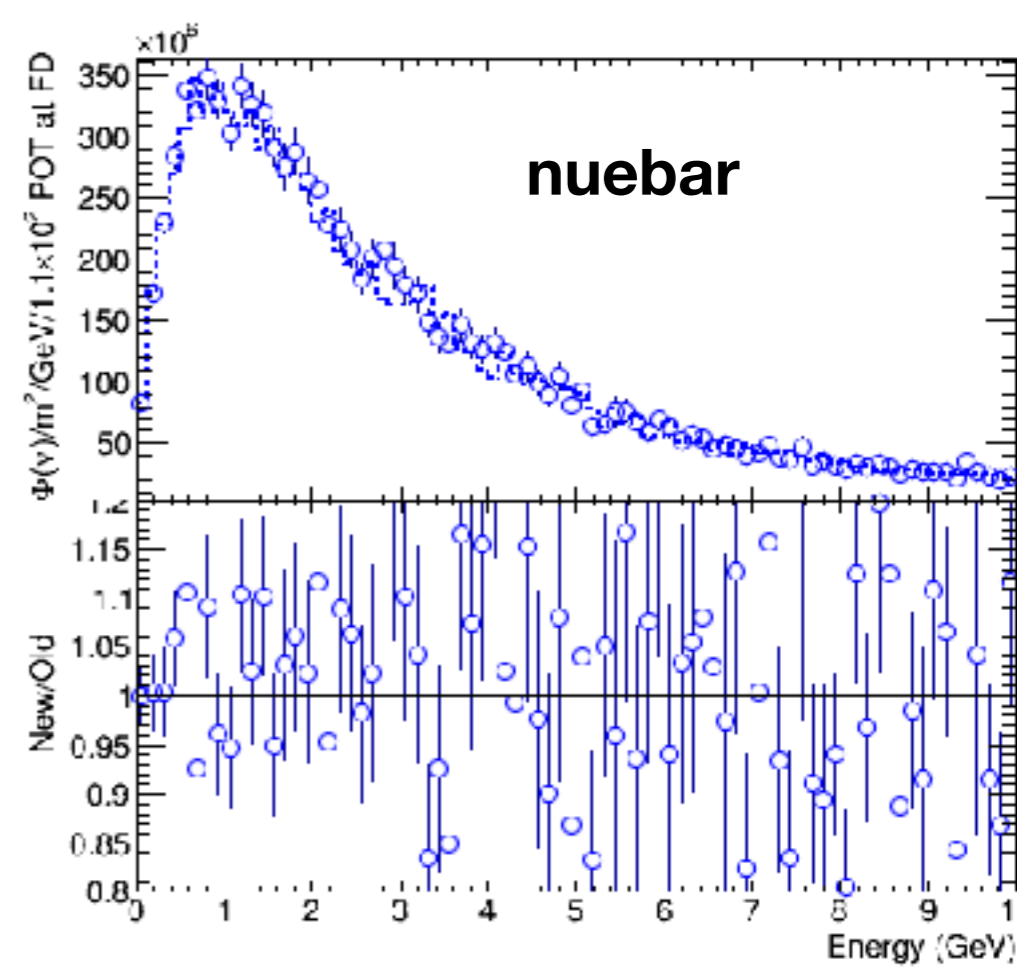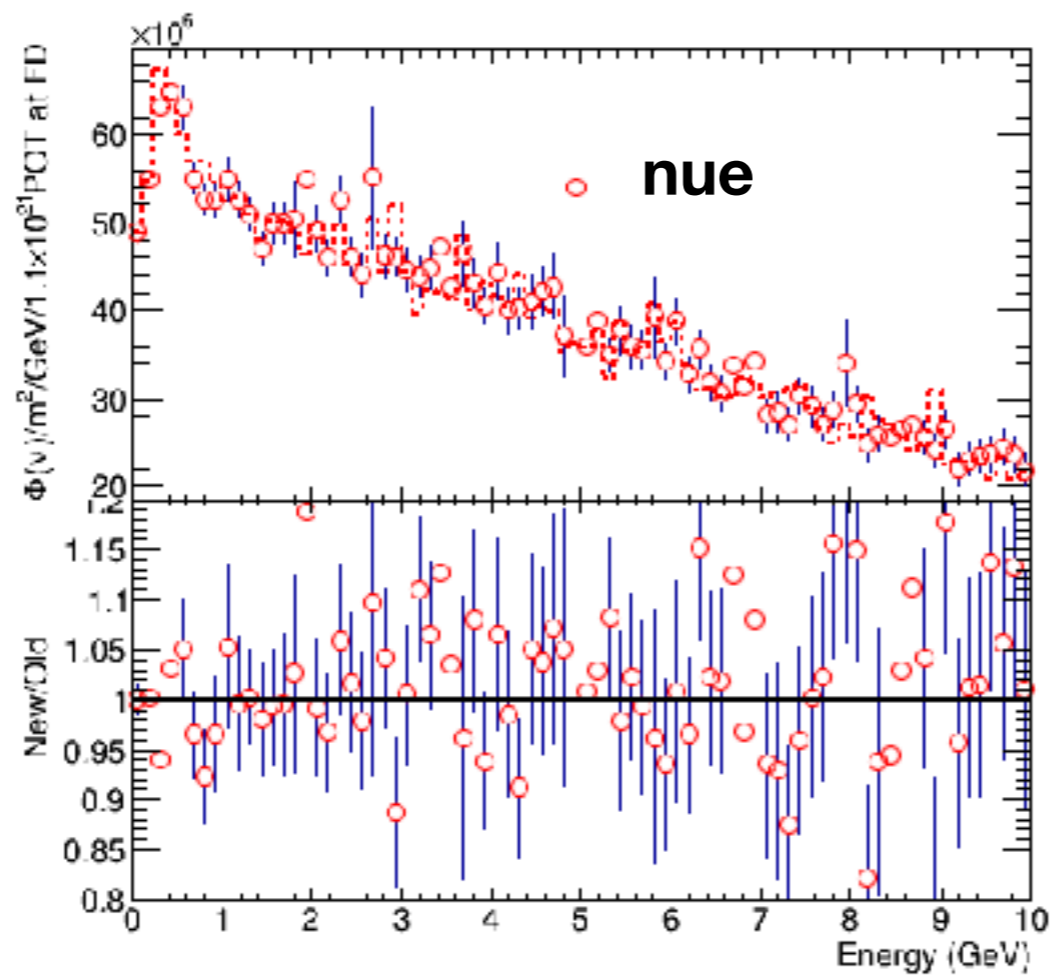
- Neutrino mode

• Antineutrino mode

Plots for TDR

- Goal is to make a consistent set of plots:

  - neutrino and antineutrino mode

  - near and far detector

  - flux broken by neutrino type, parent type

  - on axis and off axis

  - focusing and hadron production uncertainties (ND, FD, ND/FD)
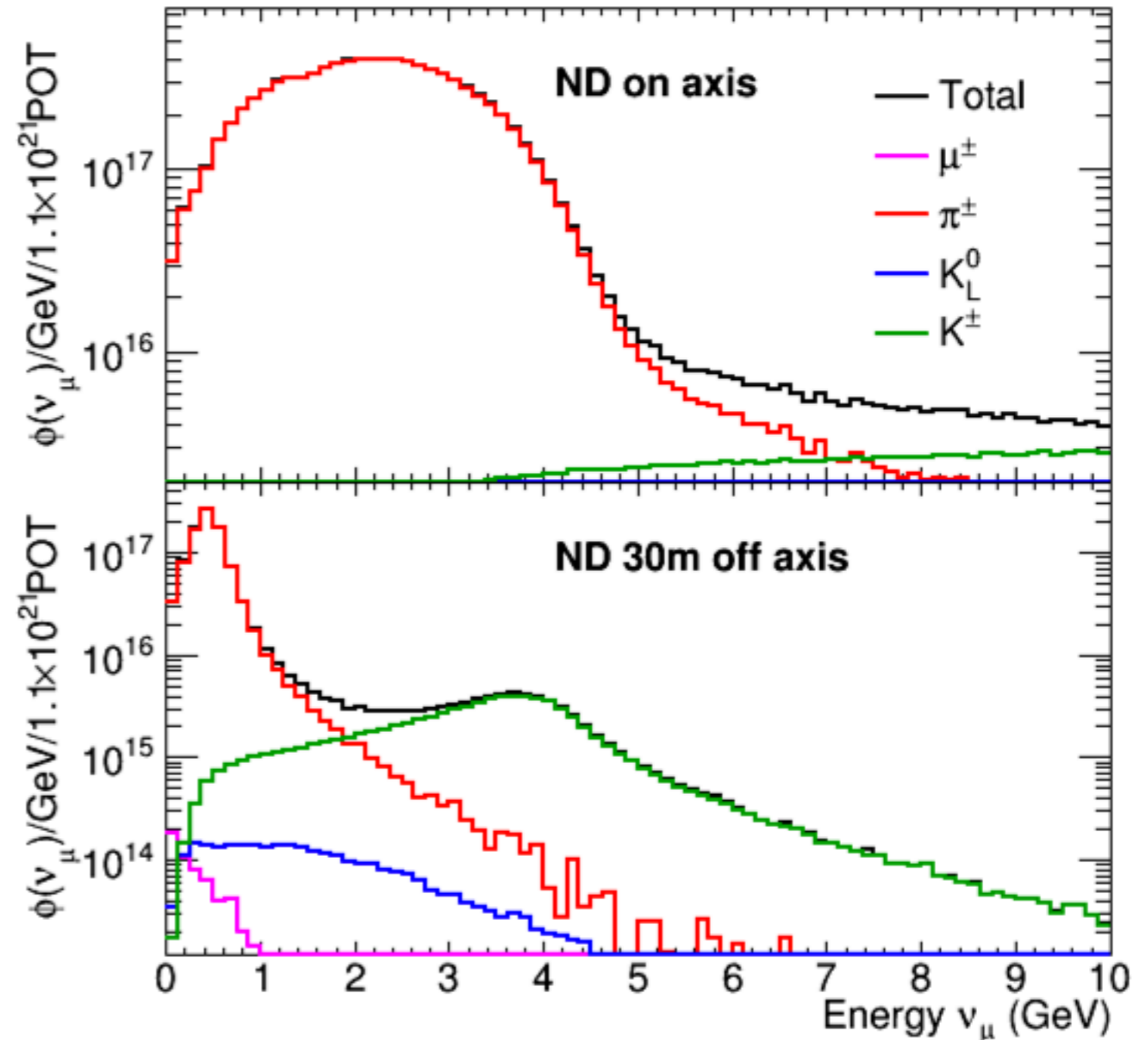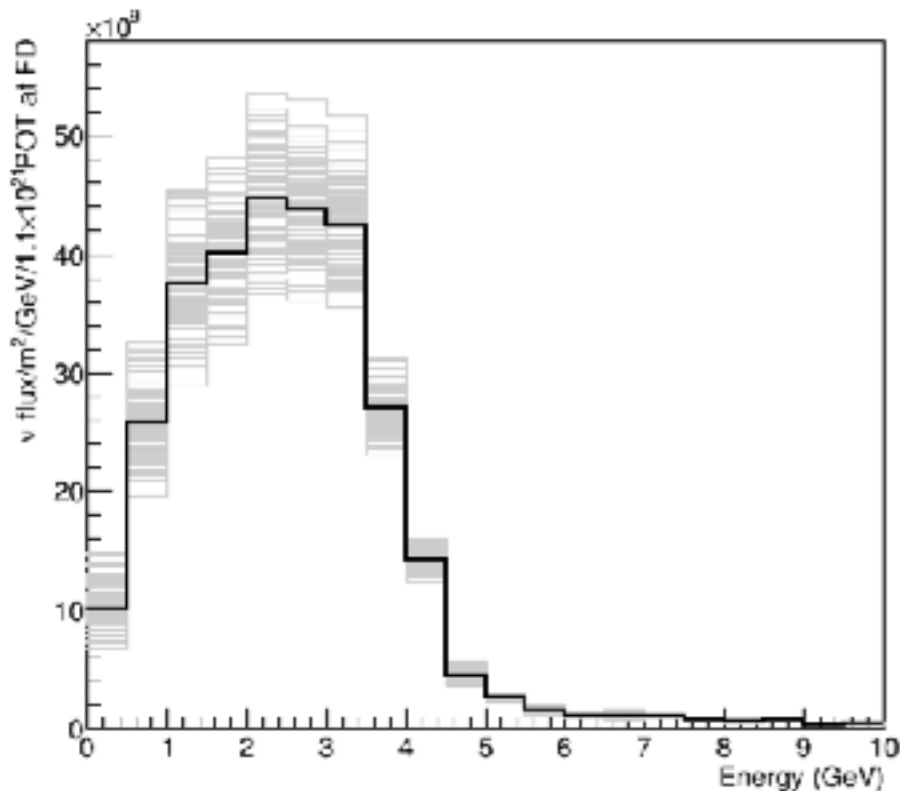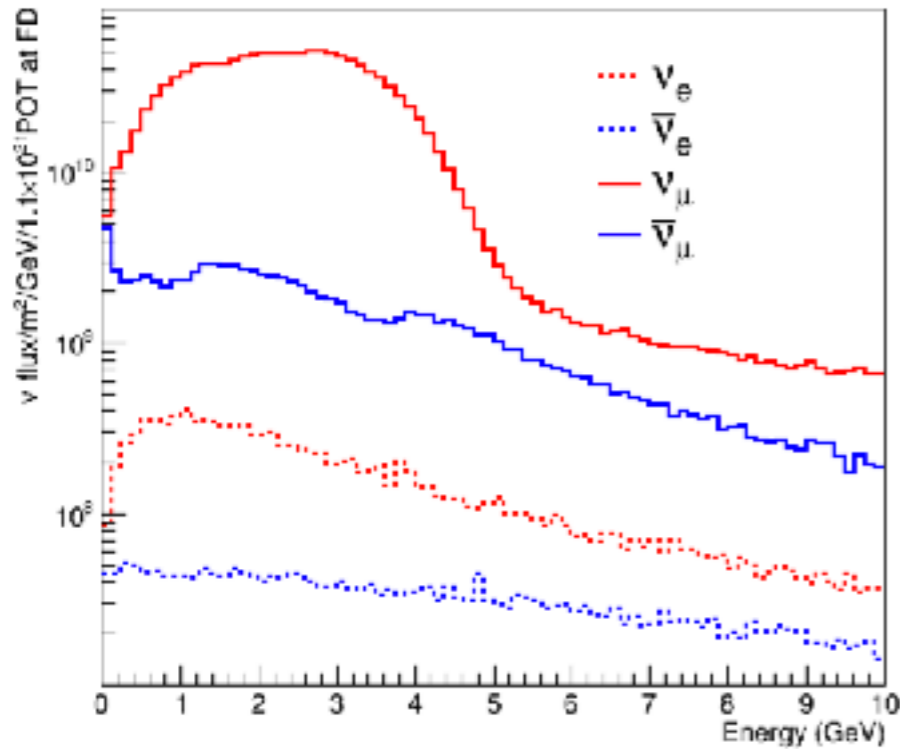
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    Need to add this

Hadron production uncertainties

- Amit setup ppfx to run within g4lbne job

- Needs also geant4 version update after ups purge

  - some dependency between geant4 version and ppfx input files - neglected at the moment

Few examples

Conclusion

- Bumped up version of geant4 with g4lbne v3r5p5

  - no significant change in flux between two versions of g4

- Building repository of flux plots made consistently for the optimized beam configuration

- Collect scripts for standard plots

- To do: focusing uncertainties