Comparison of Flux Simulations for the mn000z200i Beam: MINOS, Minerva, NOvA
and other topics

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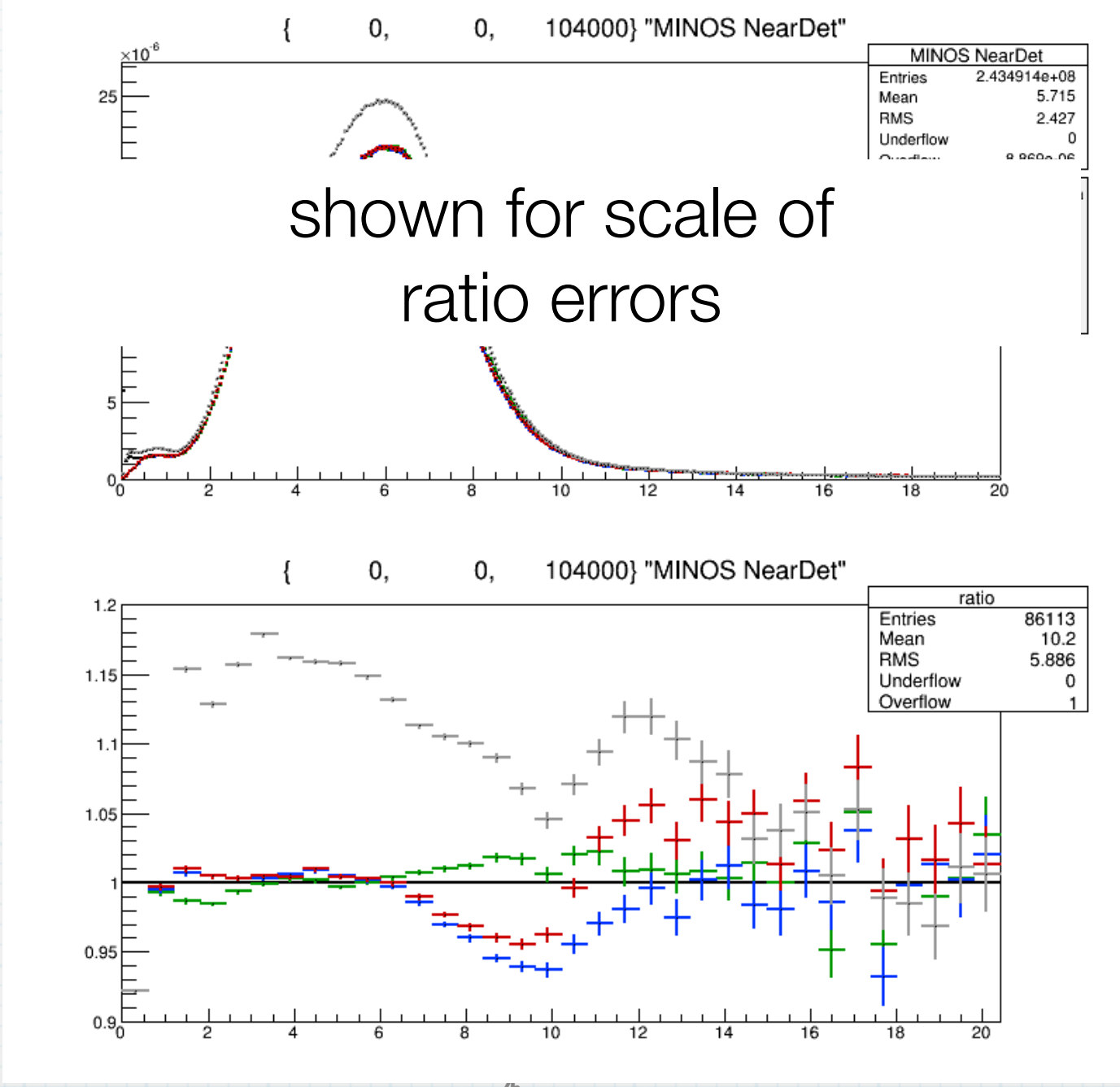
Preparation

- Gathered flux files from individual expts suggested by them as representative of mn000z200i
  - copied to /nusoft/data/flux/shared , semi-haphazard file naming and directory structures (some slight modification from source)
- Converted files from flugg “h10” or g4minerva “nudata” format to common “dk2nu” format
  - initially 100 files, but > 8GeV needs more statistics, so 500
  - files located in /nusoft/data/flux/dk2nu x
  - converted using setup
    - source /nusoft/app/external/setup
    - setup dk2nu v01_00_00 -q e5:debug # ROOT v5.34.18a
- Histogrammed flux, weighted for the various locations with fine binning
- Overlaid fluxes, rebinned coarser for ratio

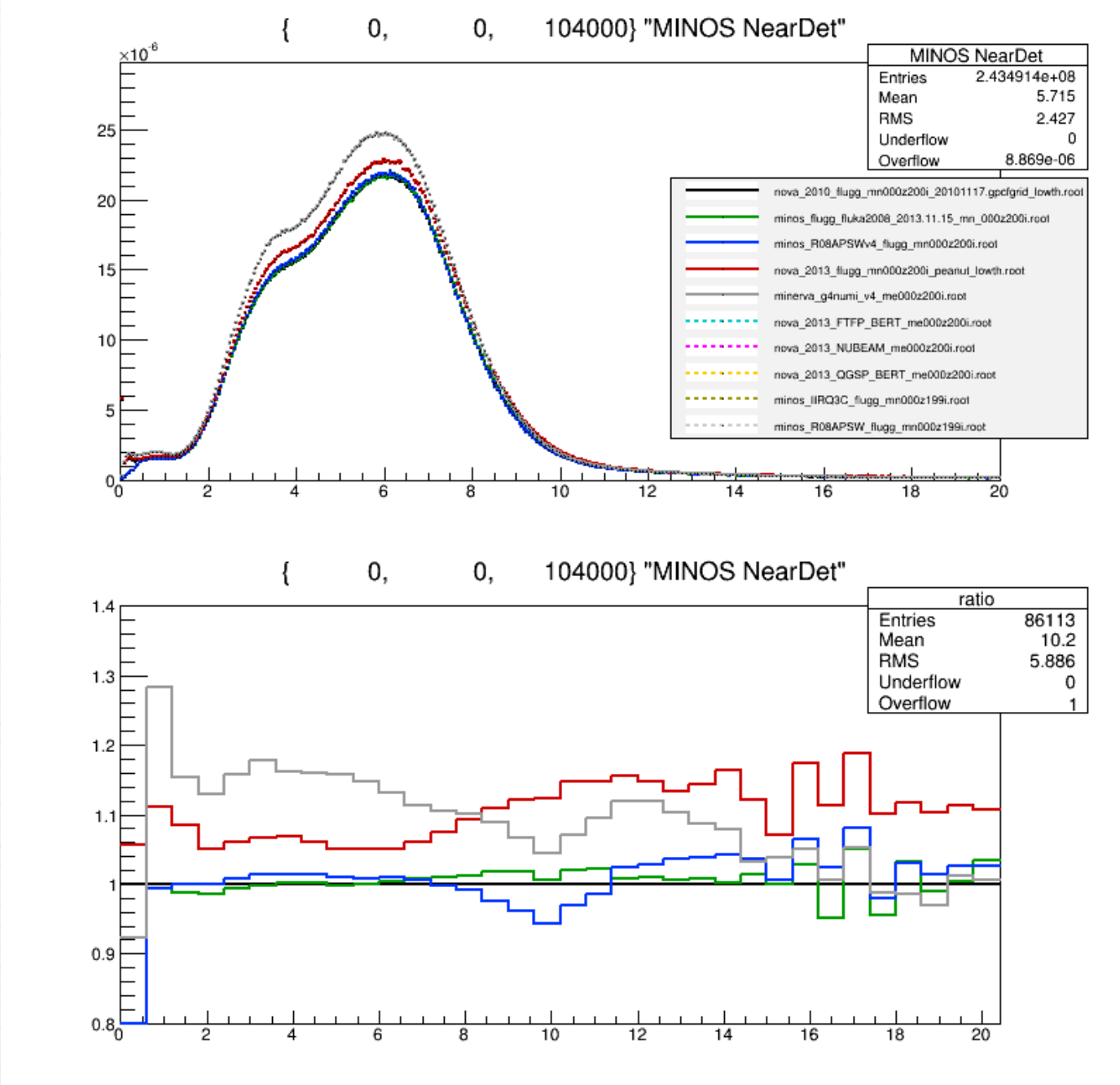
Available mn000z200i

- Files in subdirectories under temporary structure
  - /nusoft/data/flux/dk2nu/<expt>
- 10 classes of NOvA-target forward horn current:
  - nova_2010_flugg…: Luke's files
  - minos_flugg_fluka2008_2013.11.15: + horn2 pos correction
  - minos IIRQ3C: + 3 corrections
    - target moved
    - horn current distribution
    - horn current 199kA (misunderstanding about this issue)
  - minos R08APSW: + prevent importance weight = 0 for early interaction upstream of target
  - minos R08APSWv4: + horn 200kA, spot 1.3x1.3->1.1x1.1mm
  - minerva: Geant4.9.2p03 FTFP_BERT v1.0
  - nova: G4.9.6p01a FTFP_BERT, QGSP_BERT, NUBEAM
  - nova_2013_peanut_lowth: fluka 2011.x, flugg 2009_3 G4.9.3p02 gcc3.4.3

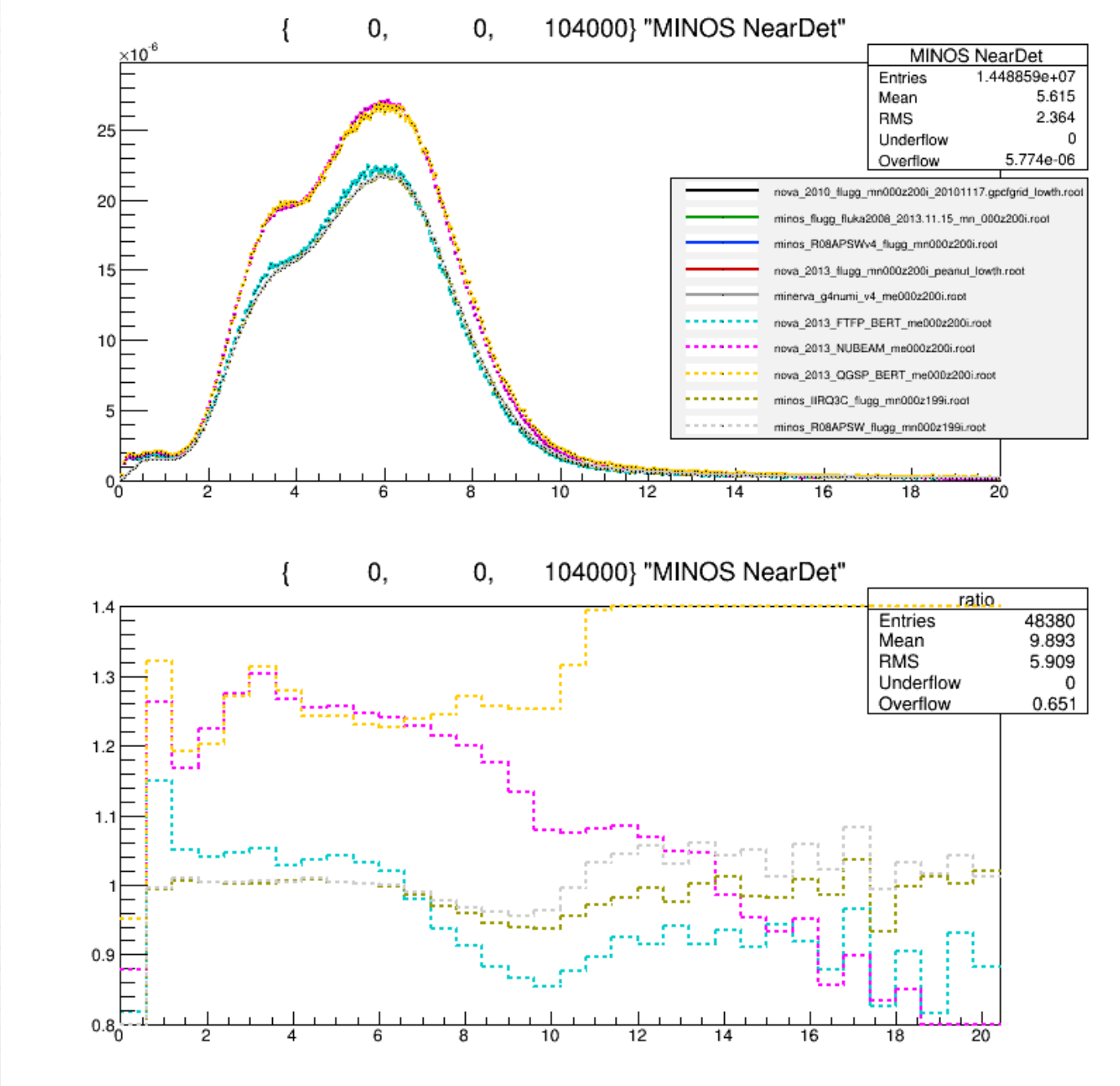
MINOS ND mn000z200i



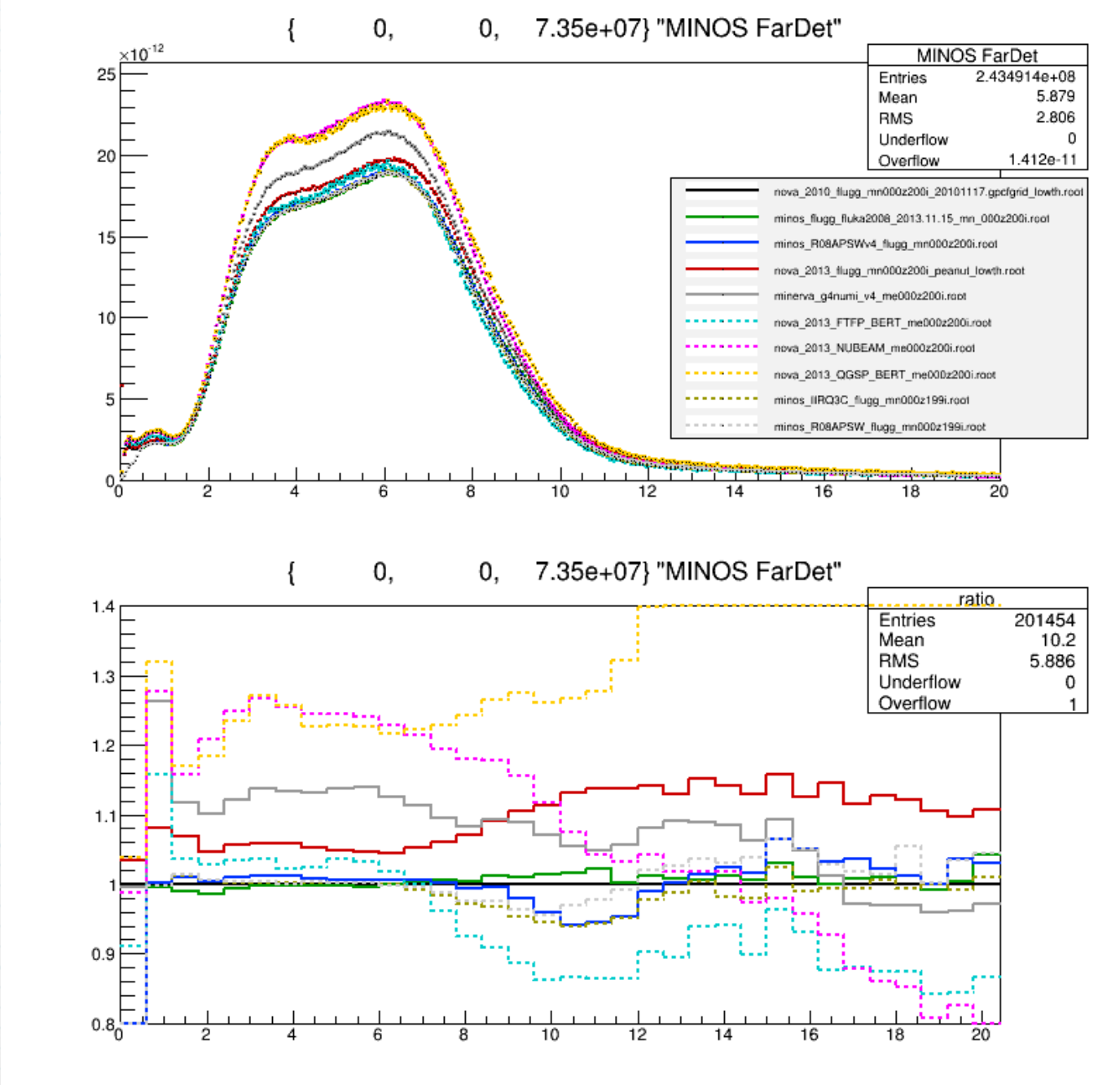
MINOS ND mn000z200i



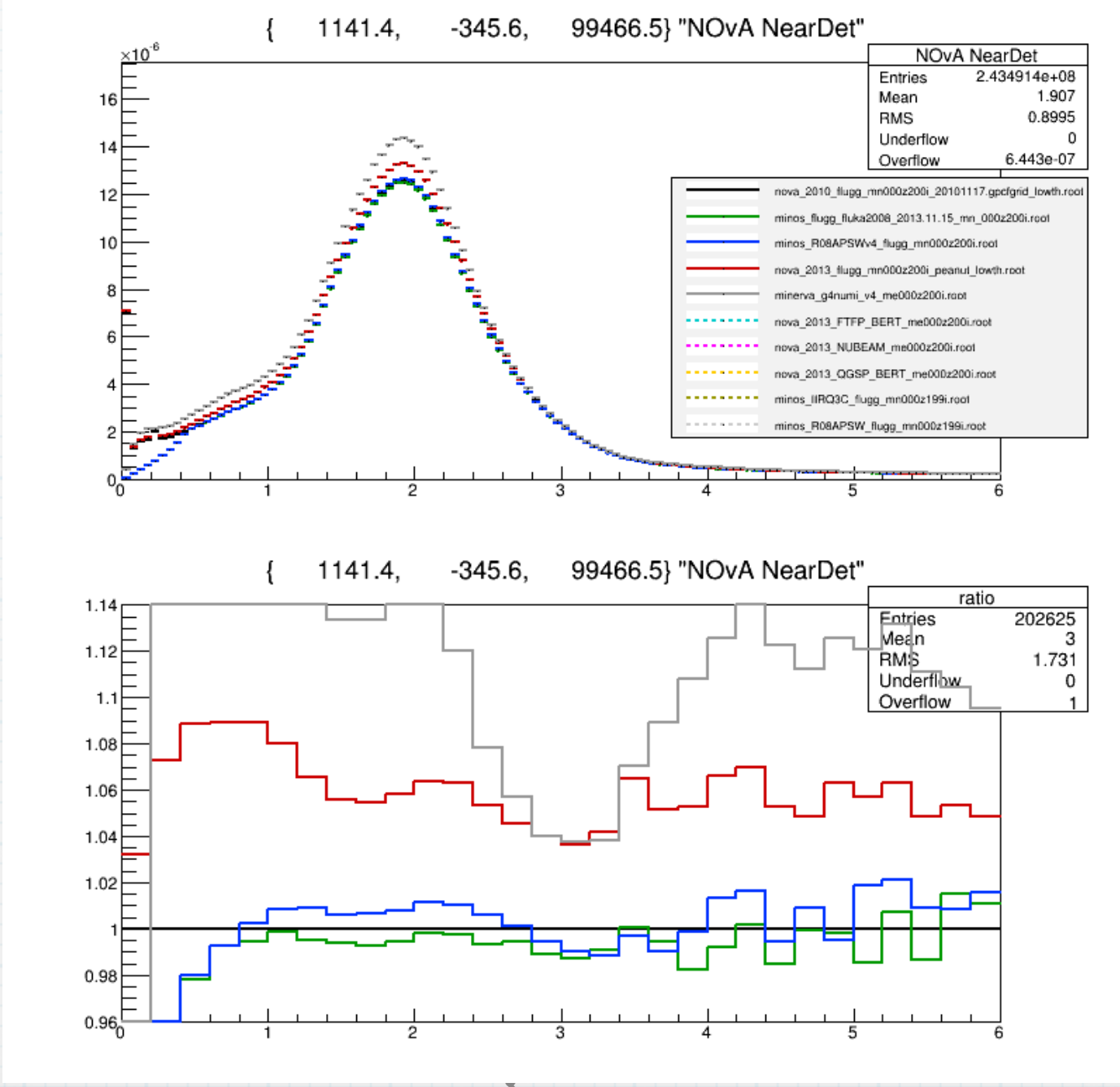
MINOS ND mn000z200i



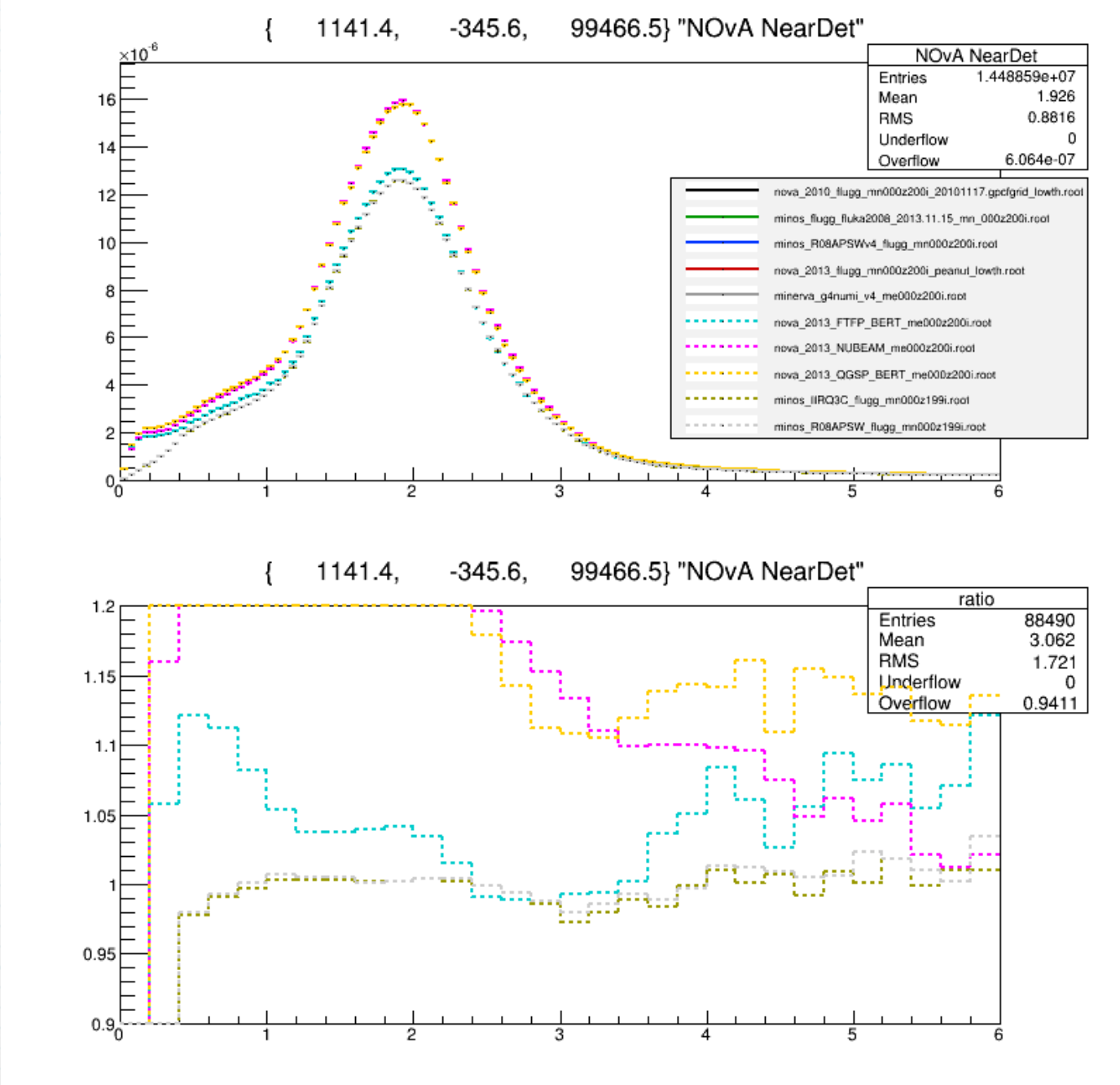
MINOS FD mn000z200i



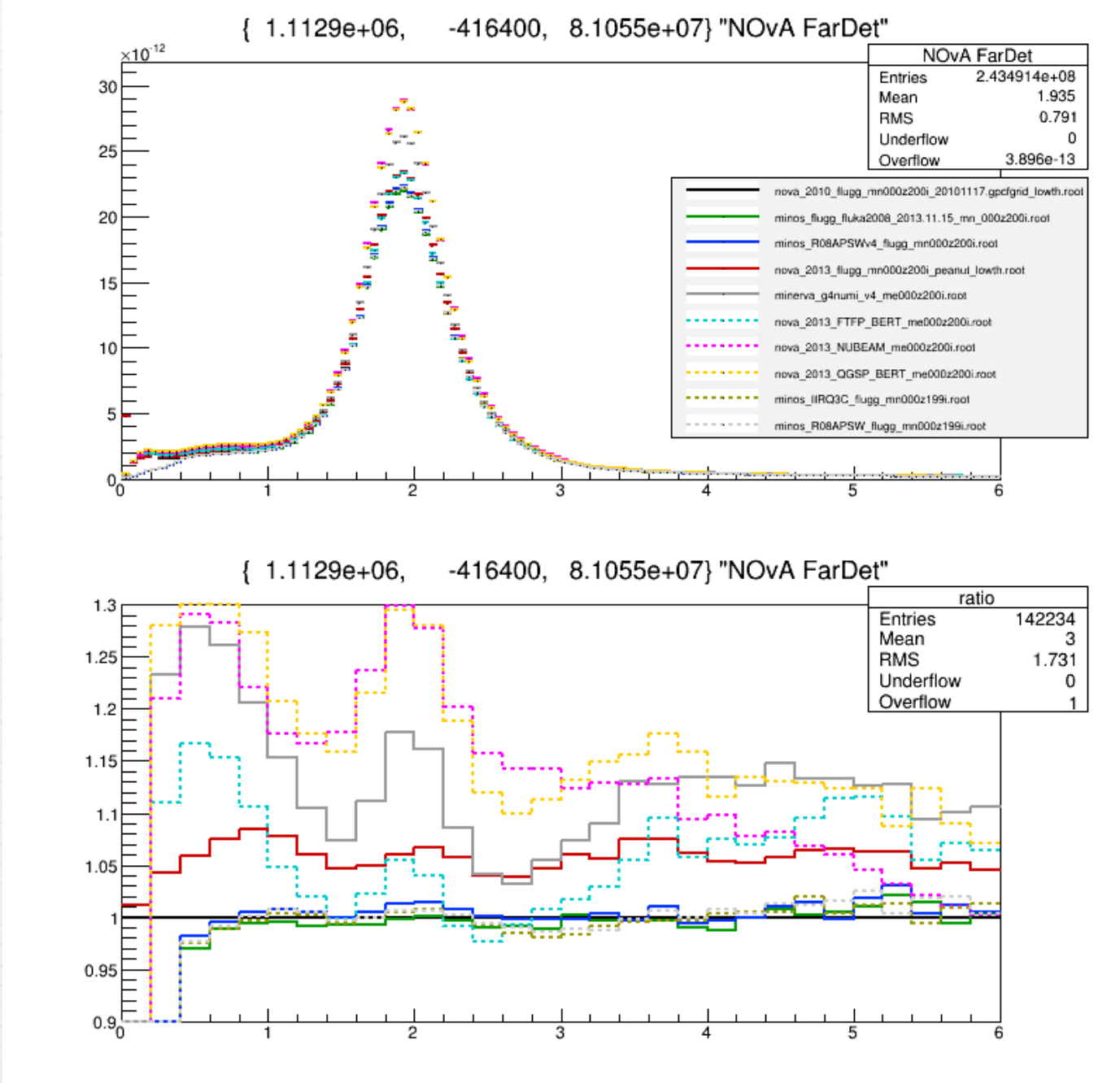
NOvA ND mn000z200i



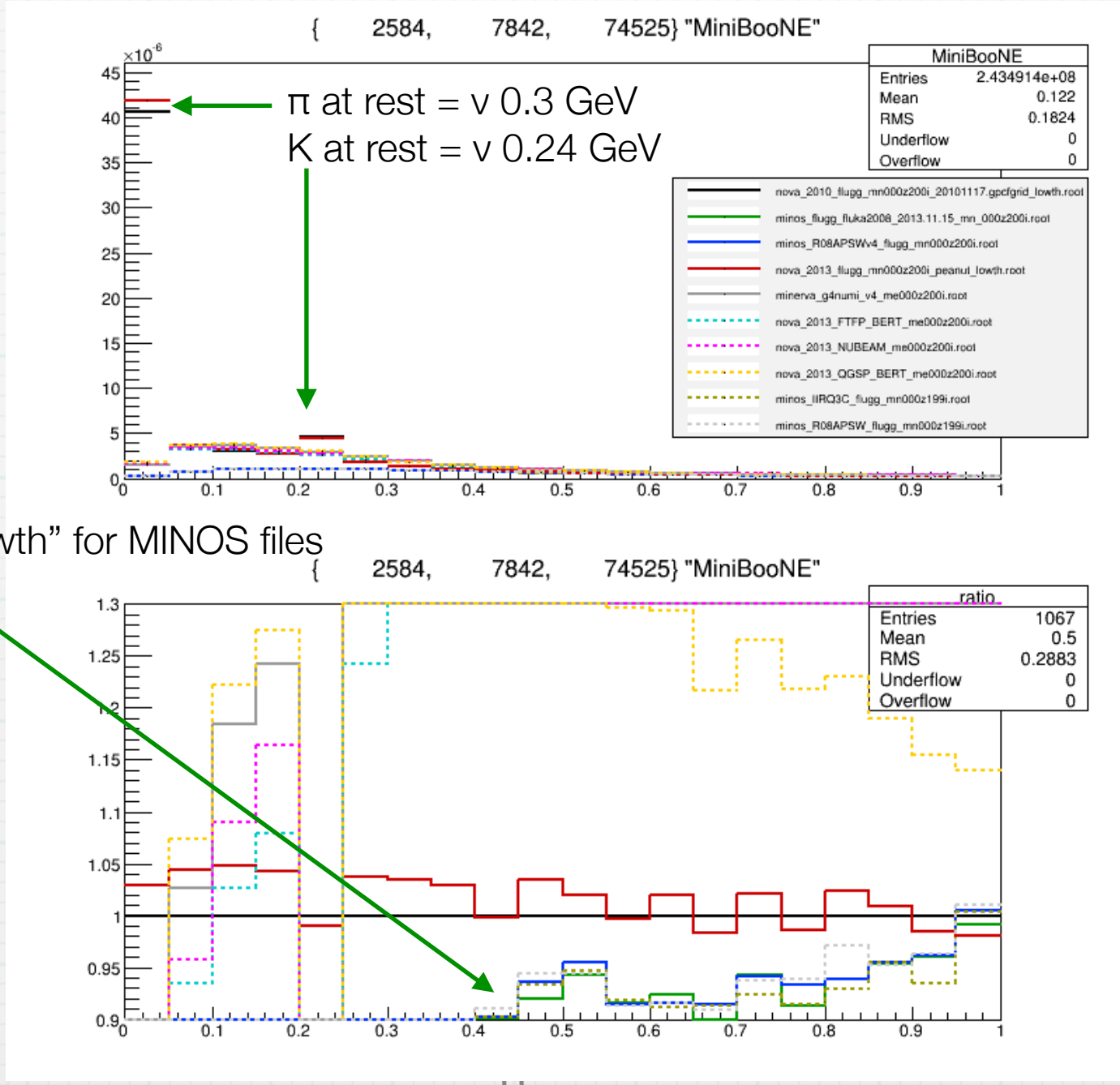
NOvA ND mn000z200i



NOvA FD mn000z200i



MiniBooNE mn000z200i



Whirlwind of Other Stuff

- Use of /nusoft/data
  - smallish (+15TB to total of 25TB) increase given, ~10TB used
  - not mounted on grid nodes (though all expts nodes)
  - highly discouraged as primary; PowersThatBe would like us to use dCache (cheaper, more space available, not so bad w/ SLF6)
- Standardize file names and directory structures. SAM wants unique file names for all time
  - Luke's earlier proposal, refine further for general case (beyond NuMI?)
  - http://nova-docdb.fnal.gov/cgi-bin/RetrieveFile?docid=7016;filename=FLUGG20120130.pdf
- Argon and H_2O inside the horns
  - need to check geometry to see how this "air" vol is implemented
  - steal code solutions, with small tweaks, from LBNE?
- Flux File Primer
  - http://numix-docdb.fnal.gov:8080/cgi-bin/ShowDocument?docid=67
  - idea is to cover the basics of what's involved w/ flux files: how are they created; how are they used; general ideas about sizes and numbers; etc.
  - evolving document; suggest additions