Low nu flux for special runs

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Ulascan has done low nu flux and total cross section comparisons for the different runs available (everything except Minerva 5A, 5B, 13A, 13B, 13D and 13E). In this presentation we show the flux and total cross section comparisons for the different runs available (everything except Minerva 5A, 5B, 13A, 13B, 13D and 13E).

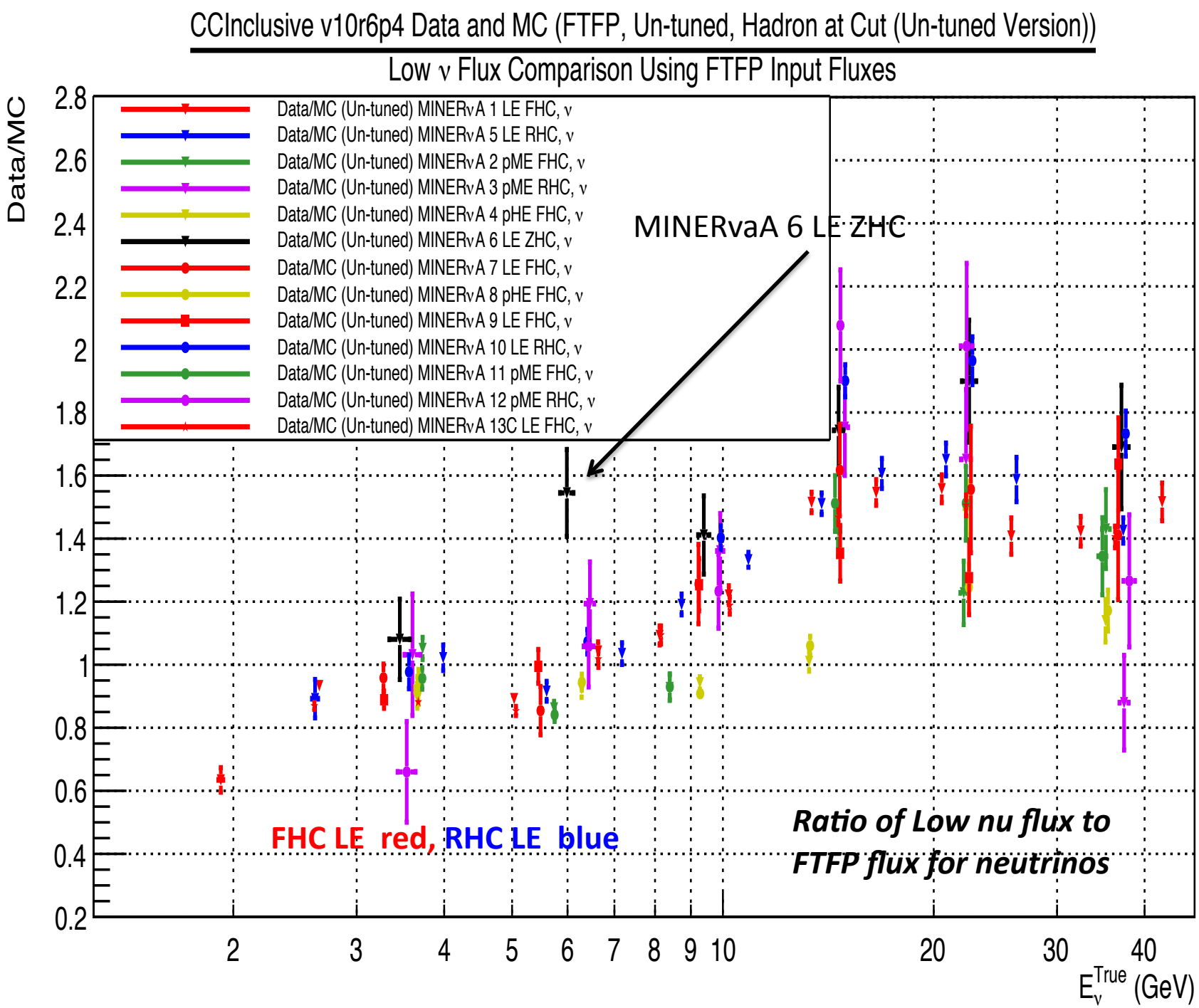
From Production Summary page, the POT information at the Reco level is as below:

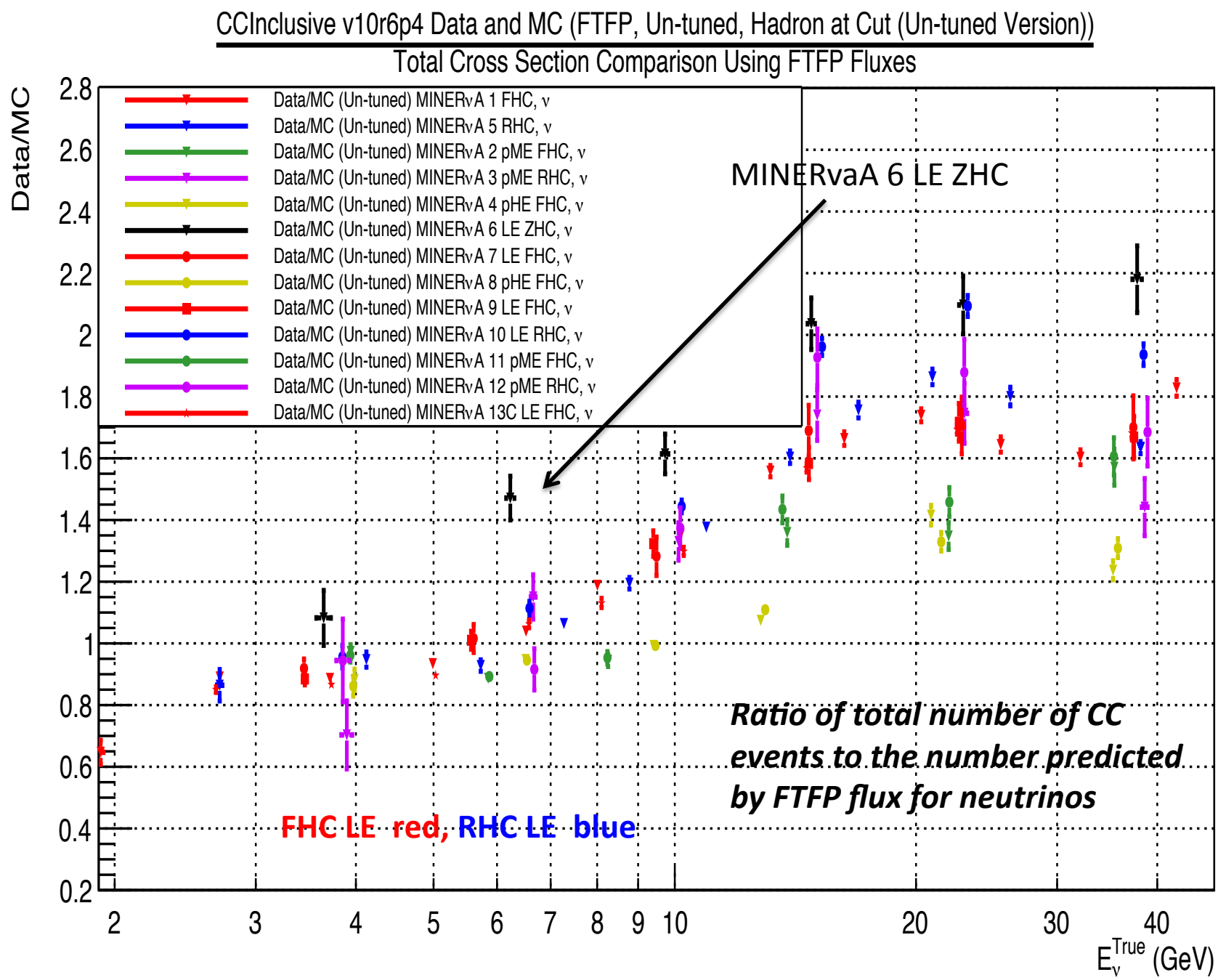
playlist_minerva13A_le010z185i_special_NoH20_FullHe.dat	1.281e+19
playlist_minerva13B_le010z185i_NoH20_FullHe.dat	1.789e+19
playlist_minerva13C_le010z185i_FullH20_FullHe.dat	**1.28e+20**
playlist_minerva13D_le010z185i_FullH20_EmptyingHe.dat	6.3737449559e+18
playlist_minerva13E_le010z185i_FullH20_EmptyHe.dat	5.12e+19

The detector configurations are (from Data Run Periods):

13A: Full He, No H2O
13B: Same
13C: Full He and H2O
13D: Partial He, full H2O
13E: No He, full H2O

All Minerva 13 are LE FHC. Only 13C is available at the CCInclusive AnaTuple level for now.


CCInclusive v10r6p4 Data and MC (FTFP, Un-tuned, Hadron at Cut (Un-tuned Version))
Low ν Flux Comparison Using FTFP Input Fluxes
Data/MC
Data/MC (Un-tuned) MINERνA 1 LE FHC, ν
Data/MC (Un-tuned) MINERνA 5 LE RHC, ν
Data/MC (Un-tuned) MINERνA 2 pME FHC, ν
Data/MC (Un-tuned) MINERνA 3 pME RHC, ν
Data/MC (Un-tuned) MINERνA 4 pHE FHC, ν
Data/MC (Un-tuned) MINERνA 6 LE ZHC, ν
Data/MC (Un-tuned) MINERνA 7 LE FHC, ν
Data/MC (Un-tuned) MINERνA 8 pHE FHC, ν
Data/MC (Un-tuned) MINERνA 9 LE FHC, ν
Data/MC (Un-tuned) MINERνA 10 LE RHC, ν
Data/MC (Un-tuned) MINERνA 11 pME FHC, ν
Data/MC (Un-tuned) MINERνA 12 pME RHC, ν
Data/MC (Un-tuned) MINERνA 13C LE FHC, ν
MINERvaA 6 LE ZHC
FHC LE red, RHC LE blue
Ratio of Low nu flux to
FTFP flux for neutrinos
E_ν^{True} (GeV)


CCInclusive v10r6p4 Data and MC (FTFP, Un-tuned, Hadron at Cut (Un-tuned Version))
Total Cross Section Comparison Using FTFP Fluxes
Data/MC
Data/MC (Un-tuned) MINERνA 1 FHC, ν
Data/MC (Un-tuned) MINERνA 5 RHC, ν
Data/MC (Un-tuned) MINERνA 2 pME FHC, ν
Data/MC (Un-tuned) MINERνA 3 pME RHC, ν
Data/MC (Un-tuned) MINERνA 4 pHE FHC, ν
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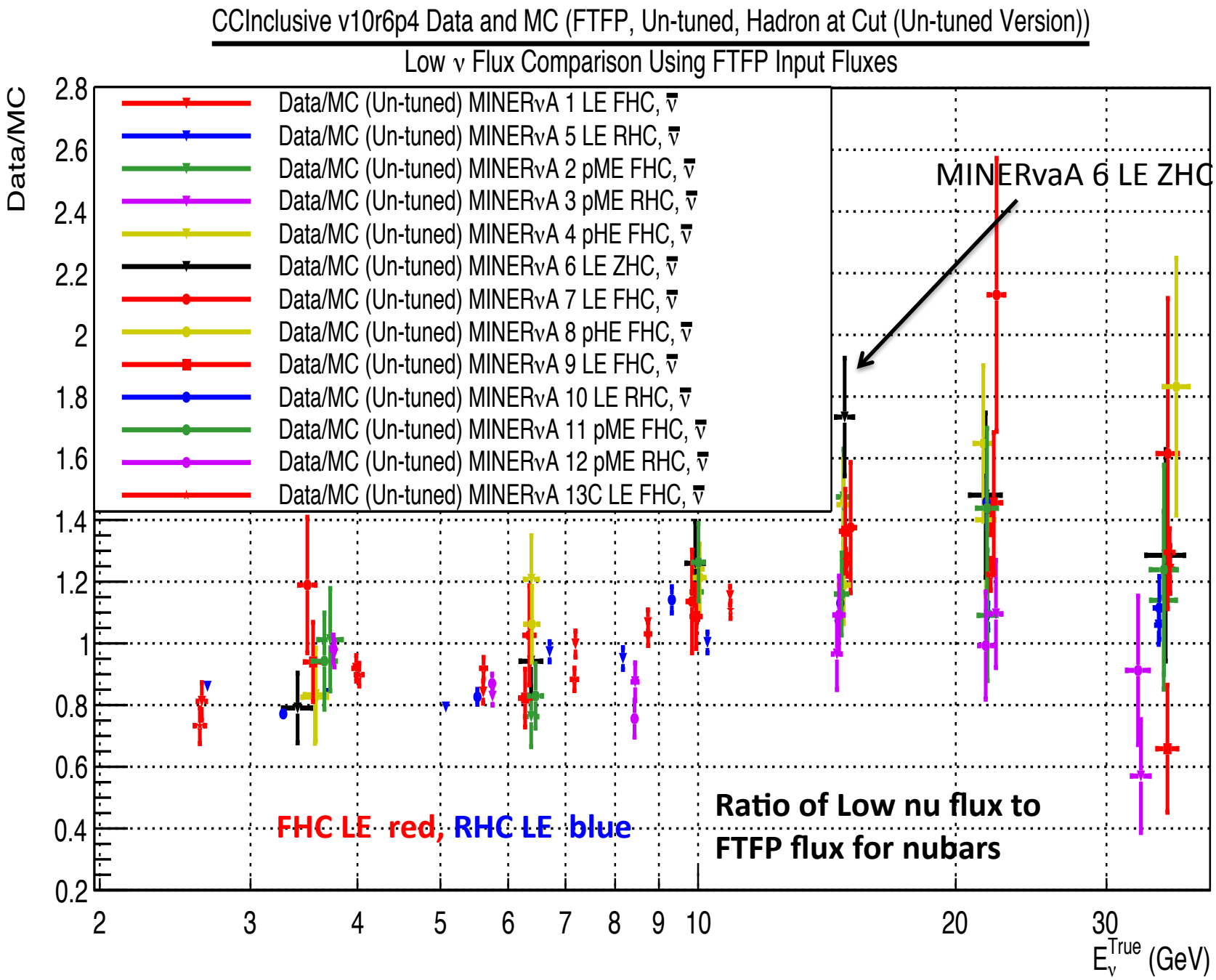
Data/MC (Un-tuned) MINERνA 12 pME RHC, ν
Data/MC (Un-tuned) MINERνA 13C LE FHC, ν
MINERvaA 6 LE ZHC
Ratio of total number of CC events to the number predicted by FTFP flux for neutrinos
FHC LE red, RHC LE blue
E_ν^{True} (GeV)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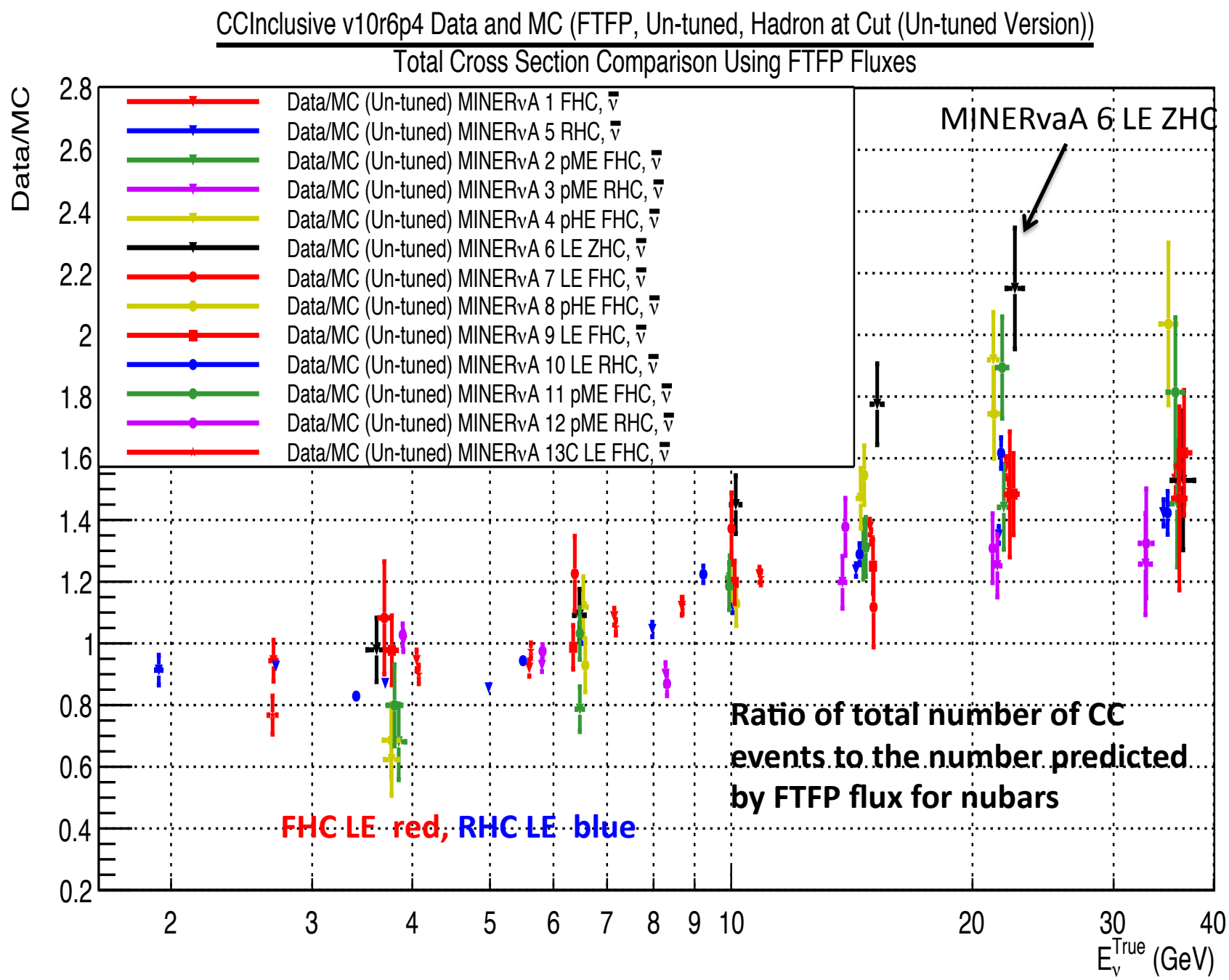
Data/MC (Un-tuned) MINERνA 13C LE FHC, ν̄
MINERvaA 6 LE ZHC
FHC LE red, RHC LE blue
Ratio of Low nu flux to
FTFP flux for nubars
E_ν^{True} (GeV)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Total Cross Section Comparison Using FTFP Fluxes
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Data/MC (Un-tuned) MINERνA 13C LE FHC, $\bar{\nu}$
MINERvaA 6 LE ZHC
Ratio of total number of CC events to the number predicted by FTFP flux for nubars
FHC LE red, RHC LE blue
E_ν^{True} (GeV)

Conclusions

- Ratio of MINERvA 1 and MINERvA 5 to FTPF appears to follow a similar trend vs neutrino energy for both nu and nubar configurations, this indicating that the x dependence of particle production is the major sources of the difference from FTPF (as opposed to the PT dependence).
- Low nu flux ratio to FTPF shows outlier playlist configurations that need to be investigated in more detail.
- Items such as incorrect status of MINOS Toroid, polarity etc could be the source of these outlier ratio