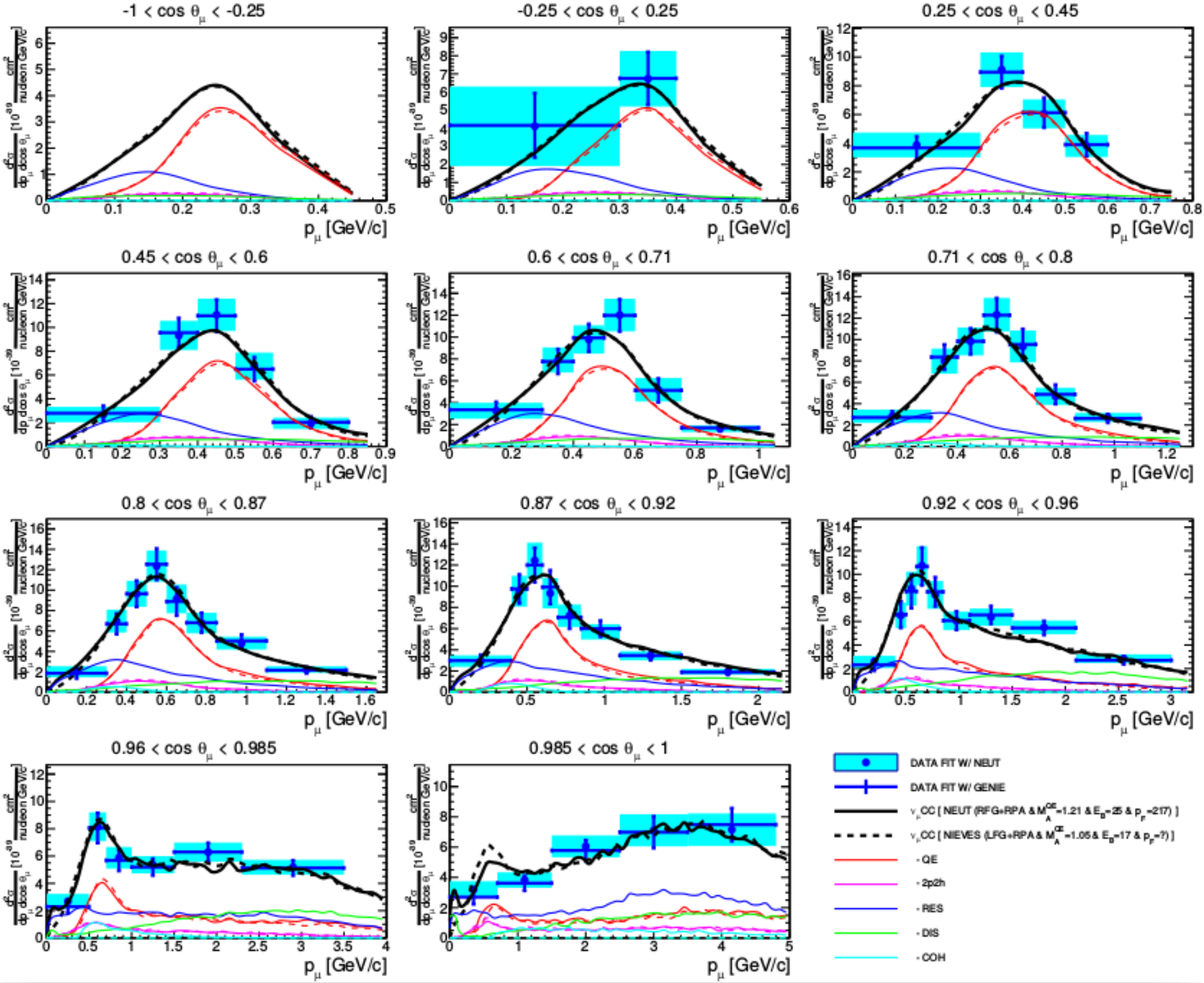
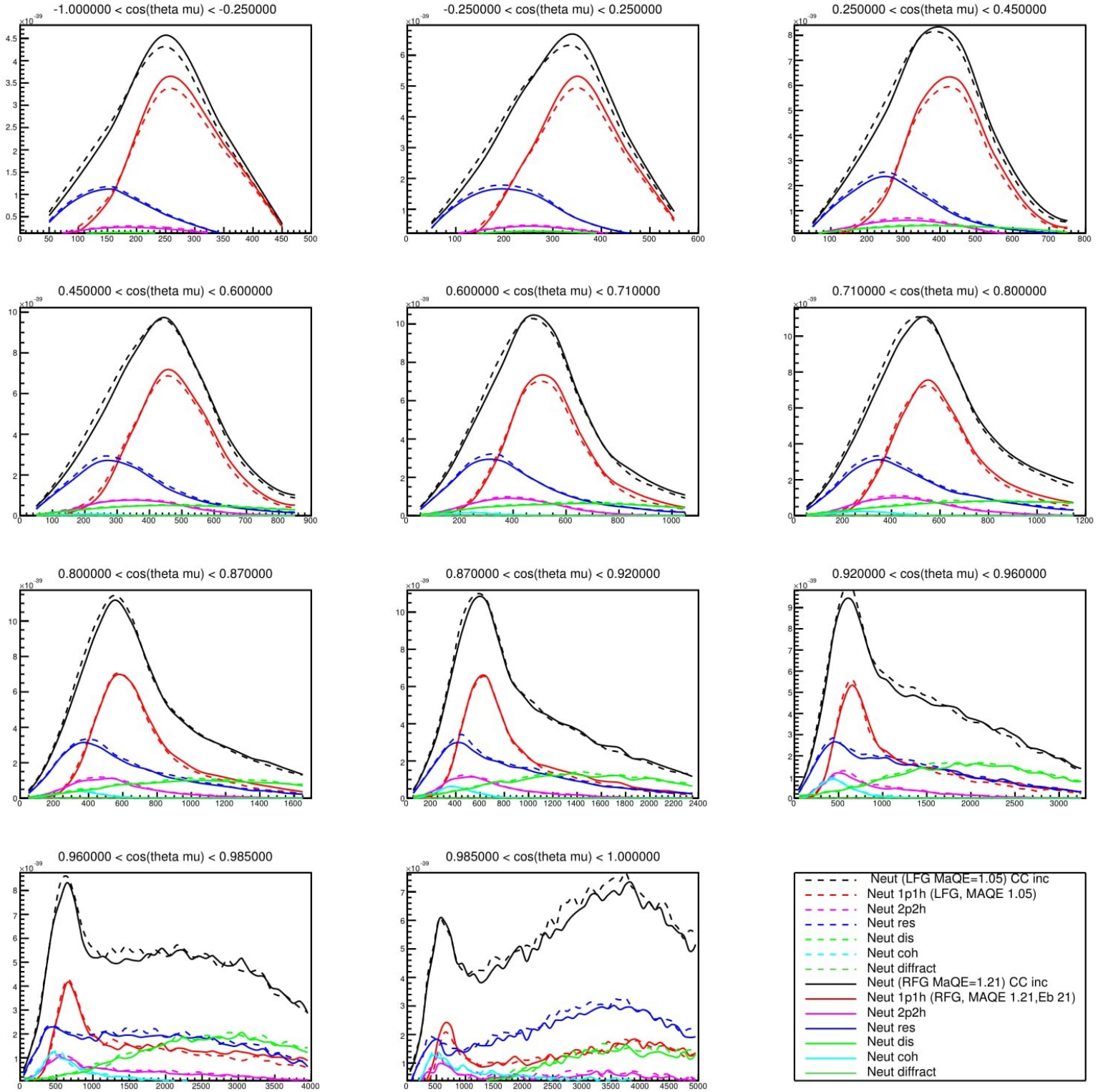
CC inclusive question

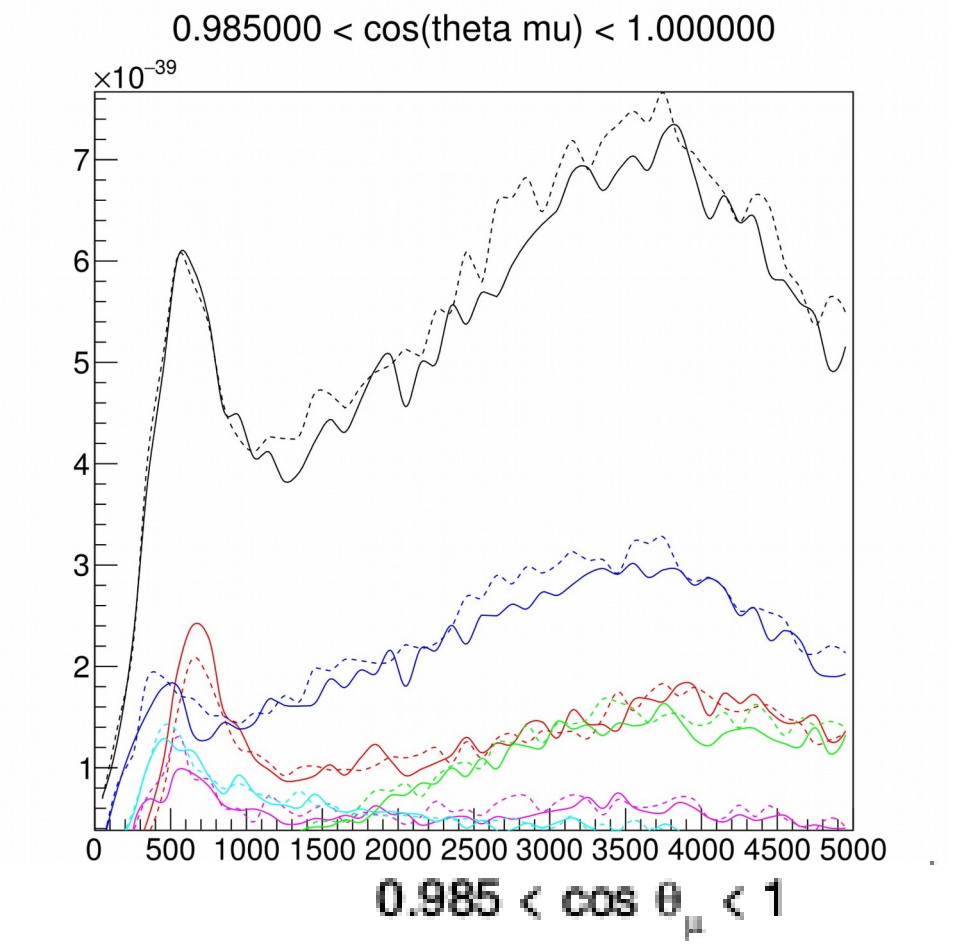
I am working on a comparison between the result from Alfonso Garcia with the CC inclusive study and the prediction Neut LFG (Nieves).

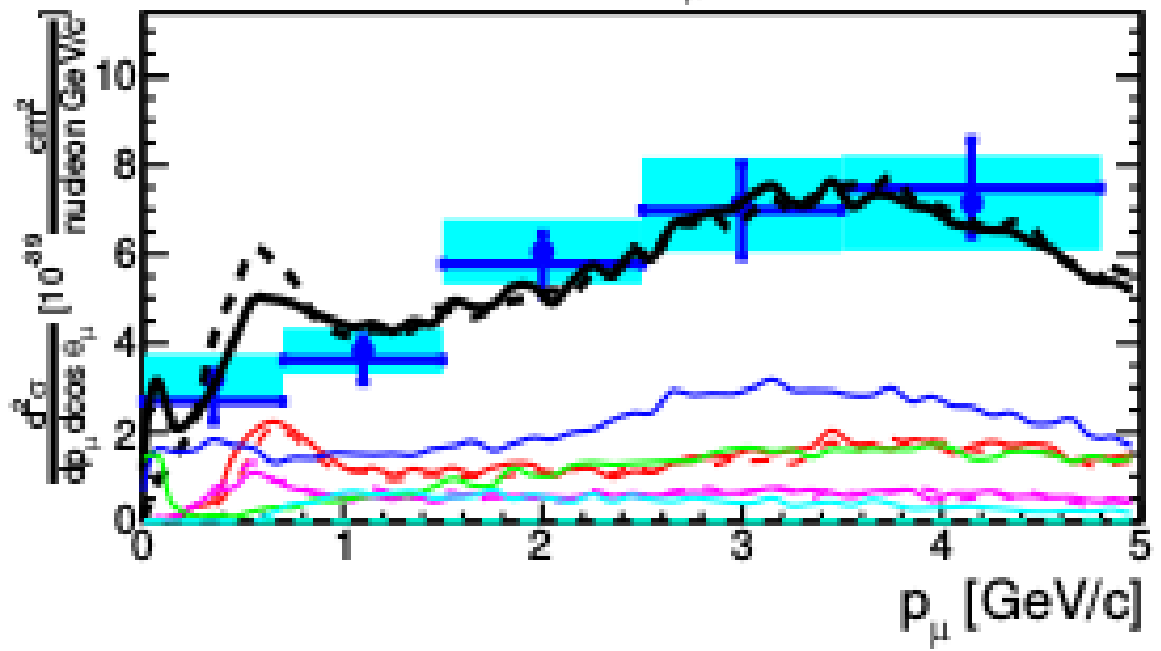
- Page 2 there is CC inclusive prediction (and also data fit) by Alfonso in full line and in dashed line you have the result from Neut using Nieves LFG (the dashed red line and dashed black line).
- Page 3 is CC inclusive prediction by Neut v 4.0 with in dashed line Nieves LFG and complete line for RFG.
- the version used for RFG prediction by Alfonso is an older version of Neut

I have now a few questions concerning those plots.

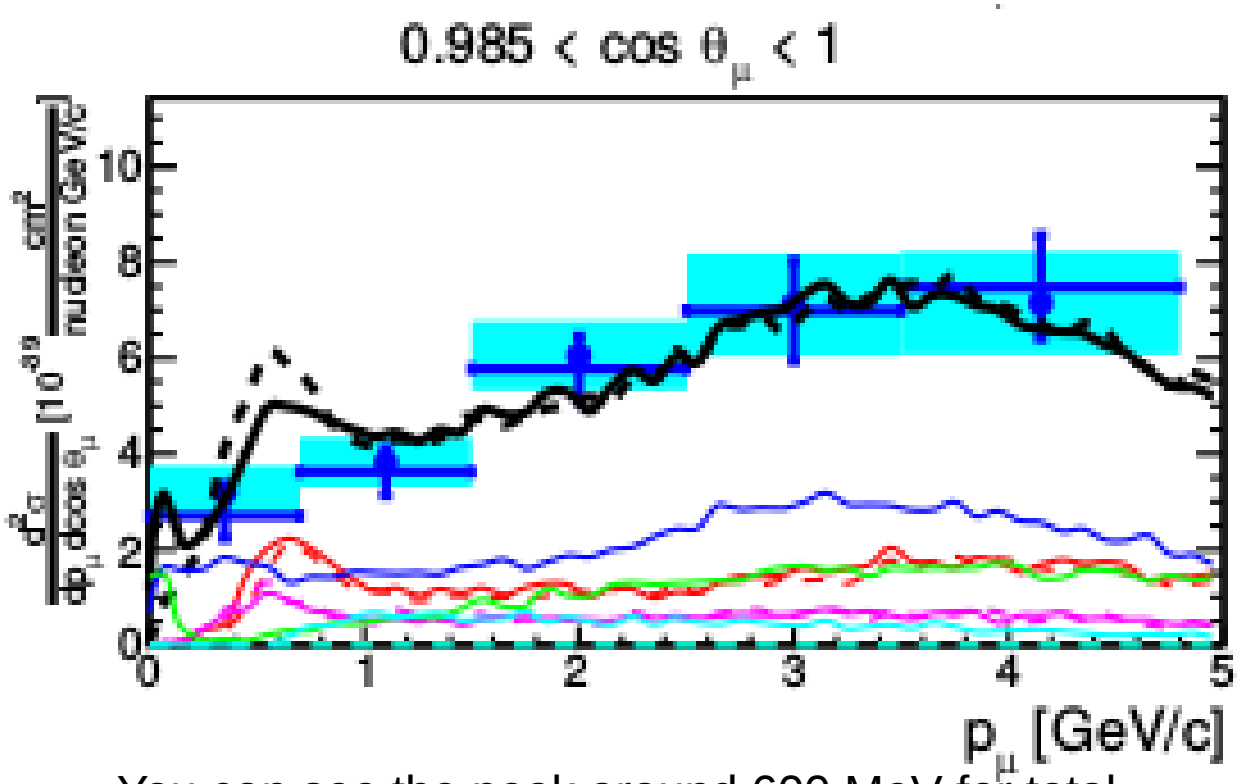

-1 < cos θμ < -0.25
-0.25 < cos θμ < 0.25
0.25 < cos θμ < 0.45
0.45 < cos θμ < 0.6
0.6 < cos θμ < 0.71
0.71 < cos θμ < 0.8
0.8 < cos θμ < 0.87
0.87 < cos θμ < 0.92
0.92 < cos θμ < 0.96
0.96 < cos θμ < 0.985
0.985 < cos θμ < 1
pμ [GeV/c]
DATA FIT W/ NEUT
DATA FIT W/ GENIE
νμCC [NEUT (RFG+RPA & MAQE=1.21 & EB=25 & pF=217)]
νμCC [NIEVES (LFG+RPA & MAQE=1.05 & EB=17 & pF=?)]
- QE
- 2p2h
- RES
- DIS
- COH

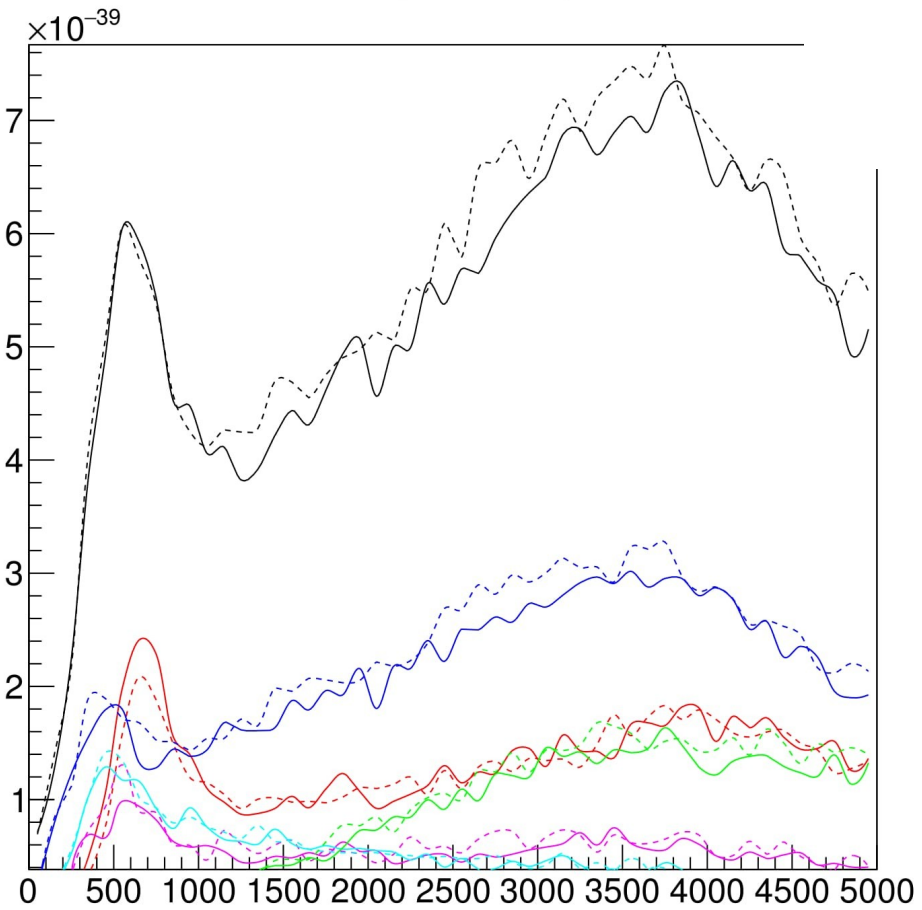

-1.000000 < cos(theta mu) < -0.250000
-0.250000 < cos(theta mu) < 0.250000
0.250000 < cos(theta mu) < 0.450000
0.450000 < cos(theta mu) < 0.600000
0.600000 < cos(theta mu) < 0.710000
0.710000 < cos(theta mu) < 0.800000
0.800000 < cos(theta mu) < 0.870000
0.870000 < cos(theta mu) < 0.920000
0.920000 < cos(theta mu) < 0.960000
0.960000 < cos(theta mu) < 0.985000
0.985000 < cos(theta mu) < 1.000000
Neut (LFG MaQE=1.05) CC inc
Neut 1p1h (LFG, MAQE 1.05)
Neut 2p2h
Neut res
Neut dis
Neut coh
Neut diffract
Neut (RFG MaQE=1.21) CC inc
Neut 1p1h (RFG, MAQE 1.21,Eb 21)
Neut 2p2h
Neut res
Neut dis
Neut coh
Neut diffract



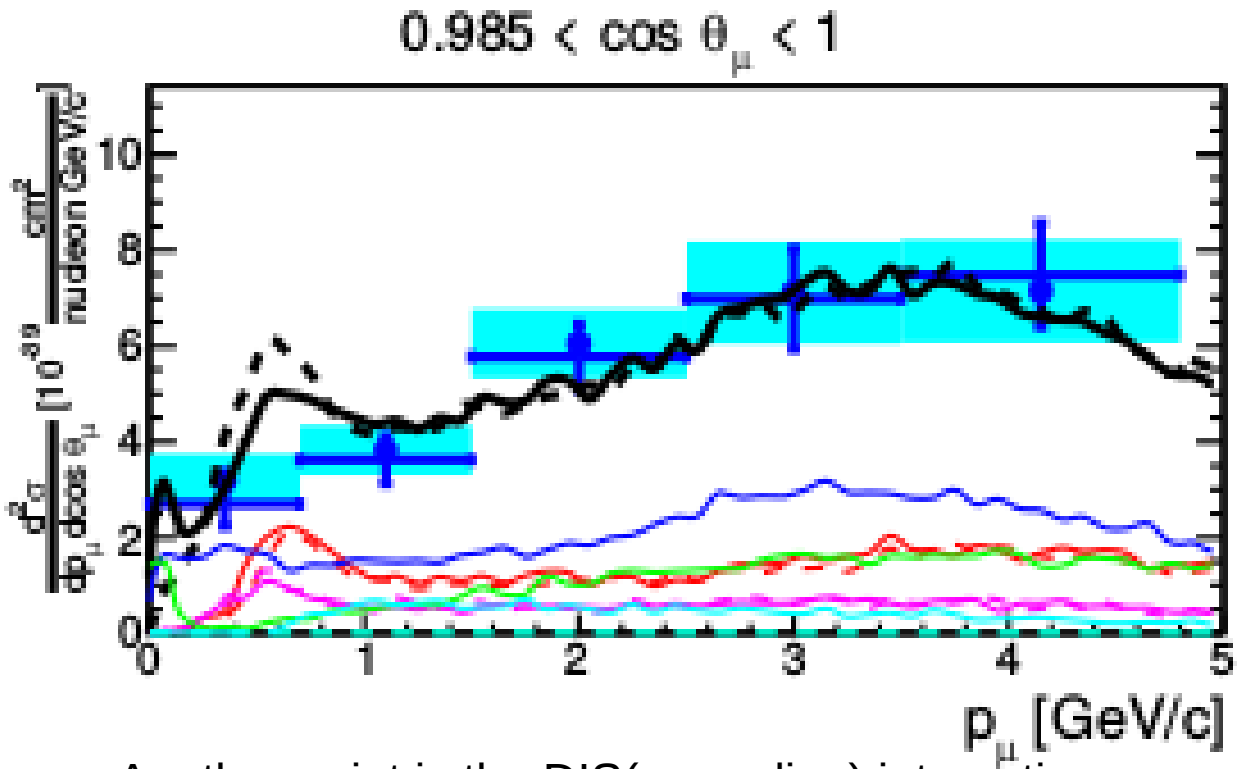


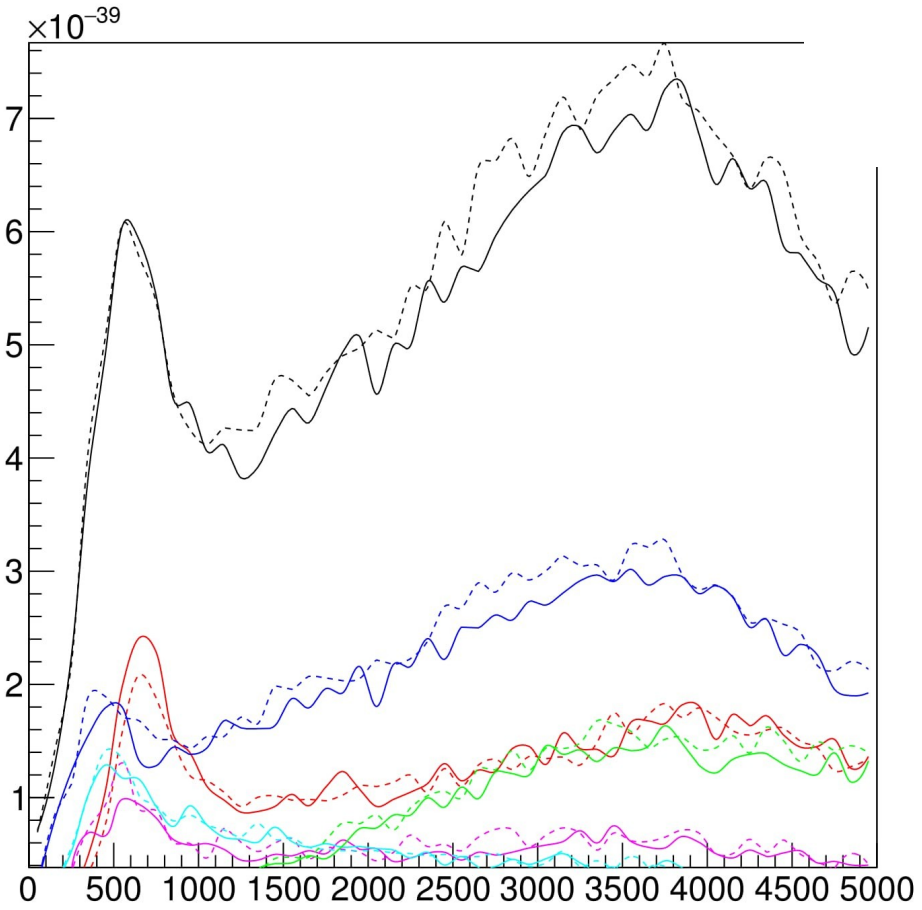
- Forward angle binning
- Most critical issue can be seen here
- My first question would be to know if any angle smearing due to neutrino flux is applyed to Alfonso prediction ?
- Because at low momentum (<200 MeV) resonant interaction does not fall to 0.
- That could explain difference between prediction since I do not apply any correction to Neut v4.0 prediction



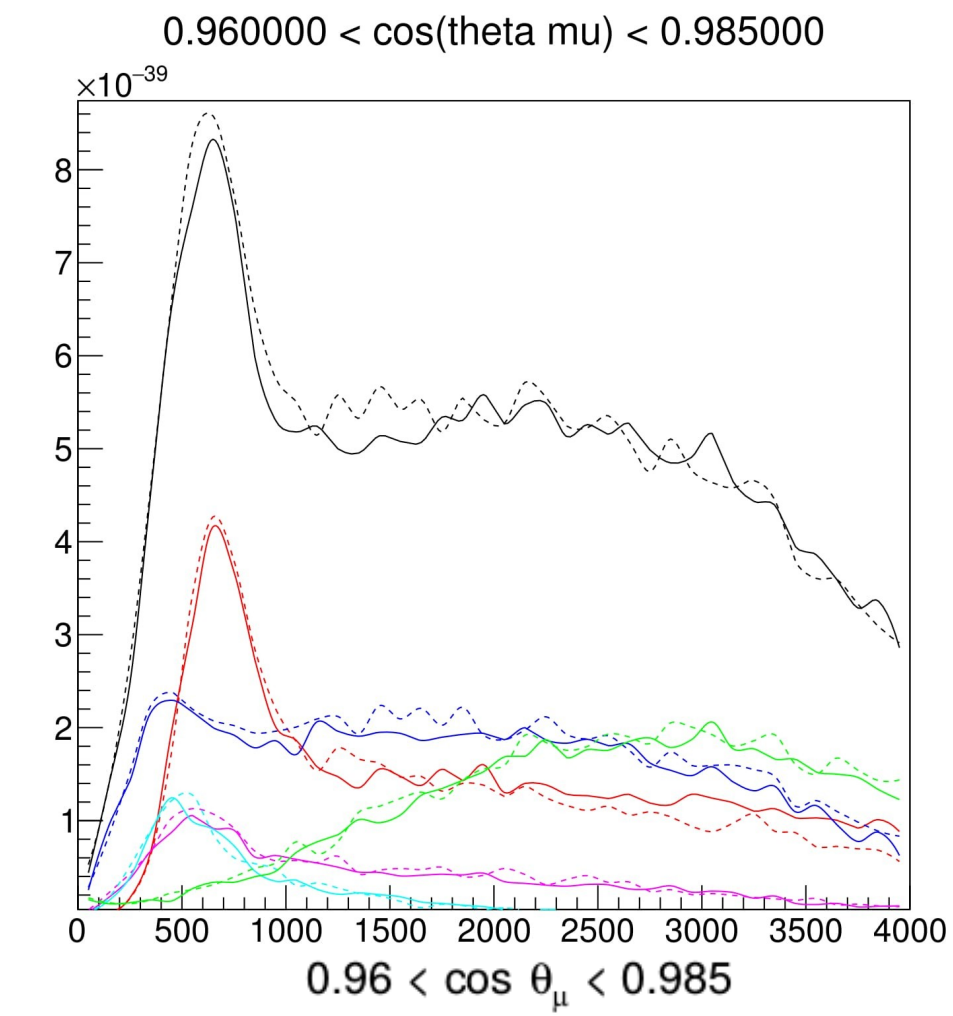


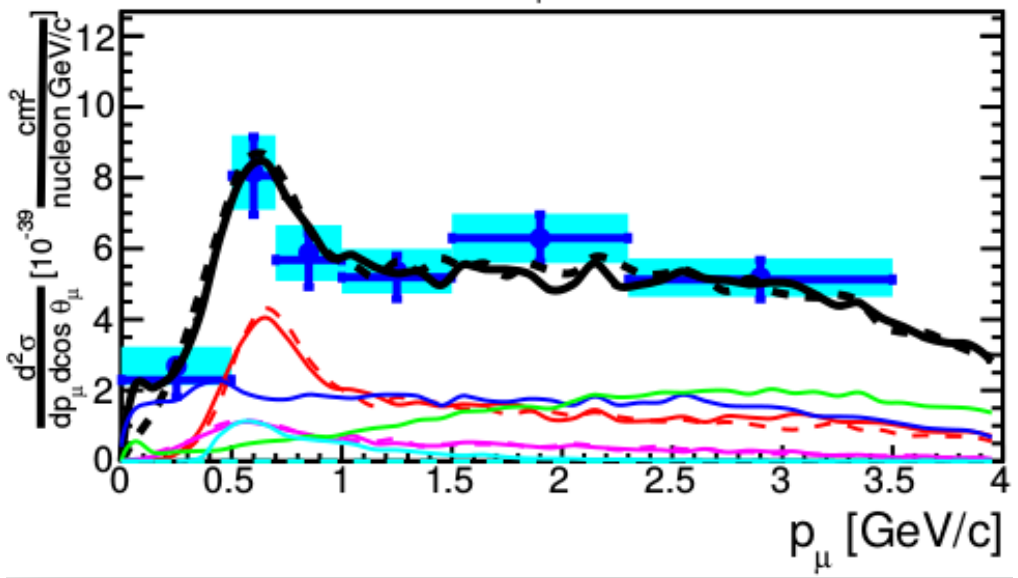
You can see the peak around 600 MeV for total cross section is not predicted in the old Neut version (upper plot)
But in Neut v4.0 you have this peak for RFG and LFG
The first problem here is the coherent interaction (light blue in both plot), in the old version you have coherent interaction beginning at 0 from 500 MeV but in Neut 5.4 coherent as a peak between 400 and 800 MeV and only decrease and goes to 0 around 3000-3500 MeV
This is quite different. And if you remove this coherent interaction peak you can approximatively have the same prediction as before



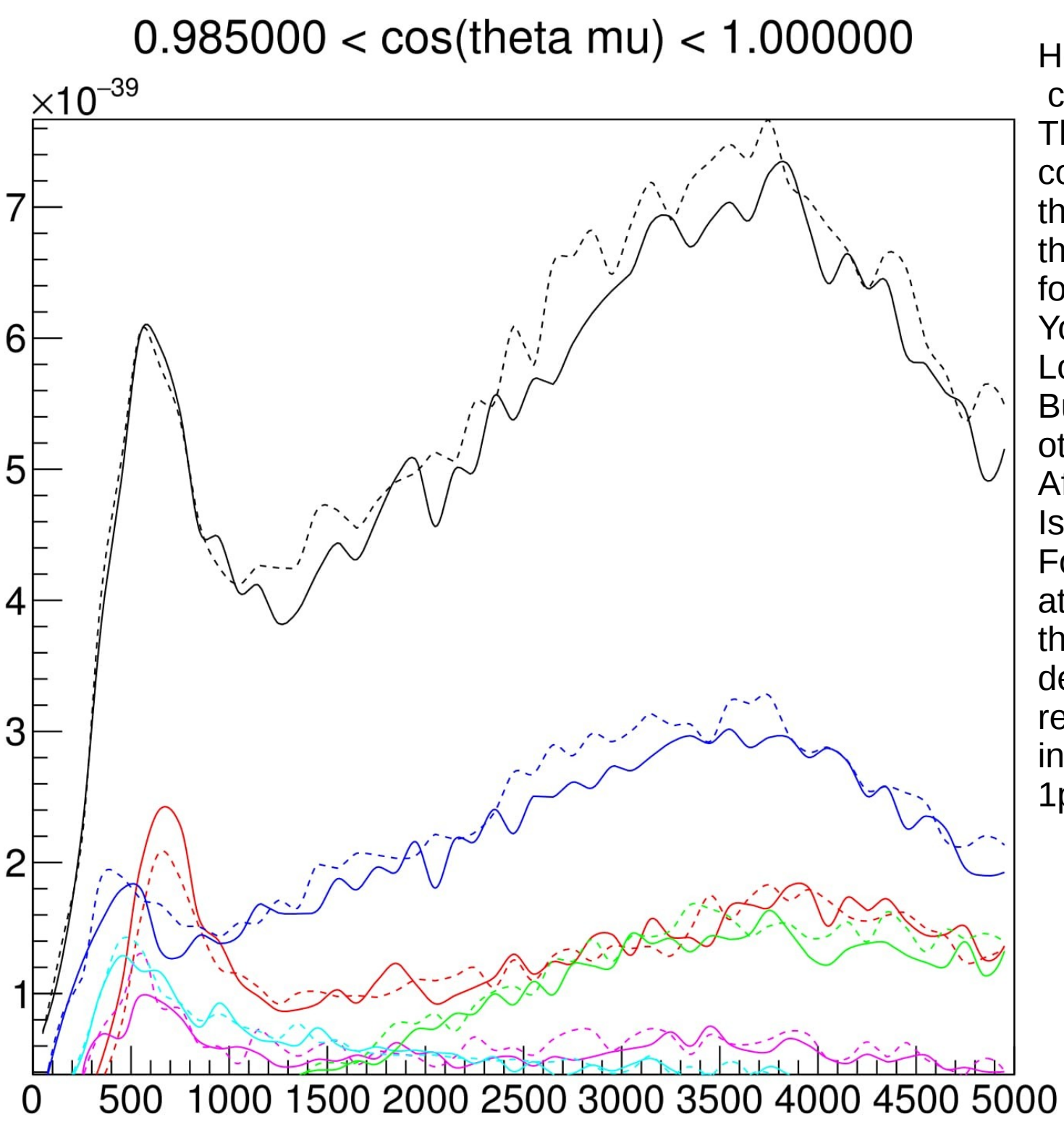


Another point is the DIS(green line) interaction Alfonso version predict a small peak at low momentum and then a rise from approximatively 500 MeV but in my prediction you have no peak at low momentum and the rise of DIS interaction begin At ~1500 MeV.
What make it so different?





- second most forward bin
- DIS has a small peak at very low momentum for Alfonso prediction and not for Neut v4.0
- Resonant interaction show the same difference of behavior at low momentum
- Coherent interaction this time show the same behavior except for the fact that you find lower momentum events (~200 MeV against 400 MeV) in Neut v4.0



Here I have a question that concern only Neut V4
The difference between the continuous line and the dashed line is only the MDLQE,MaQE, and Eb for 1p1h in my Neut card.
You can see that 1p1h is Lower for LFG than RFG.
But why does the others interactions seem Affected ?
Is it only fluctuation ?
For example,the peak at 500 MeV has the same total cross section despite LFG, as if 2p2h, resonant and coherent interaction were balancing 1p1h LFG effect ?