New GENIE Comprehensive Model Characterization

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Abstract

Characterization of new GENIE comprehensive model configurations in preparation for GENIE v3.0.0 release.

Acronyms, Abbreviations and Terms

AGKY	
AOT	Aivazis-Olness-Tung DIS charm production model
BR	Bodek-Ritchie nuclear model
BS	Berger-Sehgal model
CC	Charged Current
CMC	Comprehensive model configuration
CMT	Comprehensive model tune
COH	Comprehensive production of mesons
DFR	Diffractive production of mesons
DPE	Datasets (including their relative weighting) used explicitly for parameter estimation
EL	Elastic
ESpF	Effective spectral function model
EPS	Estimated (tuned) parameter set
FF	Form factor
FSI	Final State Interactions
HDRZ	Hadronization
INEL	Inelastic
INS	Initial Nuclear State
INTRANUKE	
LFG	Local Fermi Gas nuclear model
LS	Llewellyn Smith model
NC	Neutral Current
NeuGen	
VQE	Valencia QE model - J. Nieves, J. E. Amaro and M. Valverde
VnN	Valencia multi-nucleon (2p2h) model - J. Nieves, I. Ruiz Simo, M.J. Vicente Vacas
NRB	Non-Resonance Background
PCAC	Partially Conserved Axial Current
QE	Quasielastic
RDEC	Resonance Decay
RES	Resonance Neutrino-Production
StF	Structure Function
SpF	Spectral Function
TRM	Resonance/DIS Transition Region modeling
ZExp	Z Expansion model

1 Introduction

2 Comprehensive model configurations

The naming conventions used are explained in Appendix A. The list of CMCs characterised in this report through detailed comparisons to data is shown in Tab. 2 and the full specification is given in the tables listed there-in.

Table 2: CMC Summary Table

Name	**Summary Description**	**Spec.**
G00_00a	GENIE v2 default model	Tab. 3
G00_00b	GENIE v2 default + Empirical MEC model	Tab. 4
G16_01a	Updated empirical model: An adiabatic change of the GENIE v2 default	Tab. 5
G16_02a	A model anchored on best theory currently implemented in GENIE v3	Tab. 6
G16_02b	As G16_02a, but replacing the hA with the hN FSI model	Tab. 7

Table 3: **G00_00a**

INS	RFG; BR high-momentum tail - FGMBodekRitche/Default
NC EL	Ahrens model; dipole axial FF with M_A = 0.99 GeV^2; strange axial FF contribution η=0.12 - AhrensNCELPXSec/Default
CC QE	LS; BBA05 elastic nucleon FF; dipole axial FF with M_A = 0.99 GeV^2 - LwlynSmithQELCCPXSec/Default
CC/NC 2p2h	none
CC/NC RES	RS; dipole axial FF with with M_A = 0.84 GeV^2; 16 resonances; no inteference; - ReinSehgalRESPXSec/Default
CC/NC DIS	BY, scaling factor = 1.032 - QPMDISPXSec/Default
CC/NC COH π	RS; updated PCAC formula - ReinSehgalCOHPiPXSec/Default
CC/NC DFR π	none
ΔS=1 CC QE	none
ΔS=1 CC INEL	none
ΔC=1 CC QE	Kovalenko model - KovalenkoQELCharmPXSec/Default
ΔC=1 CC INEL	AOT - AivazisCharmPXSecLO/CC-Default
TRM	Resonances for W $<$ 1.7 GeV, NRB from BY extrapolation with NeuGen tuning
RDEC	Phase space
HDRZ	AGKY
FSI	INTRANUKE/hA - HAIntranuke/Default

Table 4: **G00_00b**

INS	RFG; BR high-momentum tail - FGMBodekRitche/Default
NC EL	Ahrens model; dipole axial FF with M_A = 0.99 GeV^2; strange axial FF contribution η=0.12 - AhrensNCELPXSec/Default
CC QE	LS; BBA05 elastic nucleon FF; dipole axial FF with M_A = 0.99 GeV^2 - LwlynSmithQELCCPXSec/Default
CC/NC 2p2h	Empirical MEC model EmpiricalMECPXSec2015/Default
CC/NC RES	RS; dipole axial FF with with M_A = 0.84 GeV^2; 16 resonances; no inteference; - ReinSehgalRESPXSec/Default
CC/NC DIS	BY, scaling factor = 1.032 - QPMDISPXSec/Default
CC/NC COH π	RS; updated PCAC formula - ReinSehgalCOHPiPXSec/Default
CC/NC DFR π	none
ΔS=1 CC QE	none

ΔS=1 CC INEL	none
ΔC=1 CC QE	Kovalenko model - KovalenkoQELCharmPXSec/Default
ΔC=1 CC INEL	AOT - AivazisCharmPXSecLO/CC-Default
TRM	Resonances for W $<$ 1.7 GeV, NRB from BY extrapolation with NeuGen tuning
RDEC	Phase space
HDRZ	AGKY
FSI	INTRANUKE/hA - HAIntranuke/Default

Table 5: **G16_01a**

INS	RFG; BR high-momentum tail - FGMBodekRitche/Default
NC EL	Ahrens model; dipole axial FF with M_A = 0.99 GeV^2; strange axial FF contribution η=0.12 - AhrensNCELPXSec/Default
CC QE	LS; BBA05 elastic nucleon FF; dipole axial FF with M_A = 0.99 GeV^2 - NievesQELCCPXSec/Default with rpa=false and coulomb=false
CC/NC 2p2h	Empirical MEC model - EmpiricalMECPXSec2015/Default
CC/NC RES	RS; dipole axial FF with with M_A = 0.84 GeV^2; 16 resonances; no inteference; - ReinSehgalRESPXSec/Default
CC/NC DIS	BY, scaling factor = 1.032 - QPMDISPXSec/Default
CC/NC COH π	RS; updated PCAC formula - ReinSehgalCOHPiPXSec/Default
CC/NC DFR π	ReinDFRPXSec/Default
ΔS=1 CC QE	PaisQELLambdaPXSec/Default
ΔS=1 CC INEL	none
ΔC=1 CC QE	Kovalenko model - KovalenkoQELCharmPXSec/Default
ΔC=1 CC INEL	AOT - AivazisCharmPXSecLO/CC-Default
TRM	Resonances for W $<$ 1.7 GeV, NRB from BY extrapolation with NeuGen tuning
RDEC	Phase space
HDRZ	AGKY
FSI	INTRANUKE2015/hA - HAIntranuke2015/Default

Table 6: **G16_02a**

INS	LFG; - LocalFGM/Default
NC EL	Ahrens model; dipole axial FF with M_A = 0.99 GeV^2; strange axial FF contribution η=0.12 - AhrensNCELPXSec/Default
CC QE	VQE; BBA05 elastic nucleon FF; dipole axial FF with M_A = 0.99 GeV^2 - NievesQELCCPXSec/Default
CC/NC 2p2h	VnN model - NievesSimoVacasMECPXSec2016/Default
CC/NC RES	BS; dipole axial FF with with M_A = 0.84 GeV^2; 16 resonances; no inteference; - BergerSehgalRESPXSec2014/Default
CC/NC DIS	BY, scaling factor = 1.032 - QPMDISPXSec/Default
CC/NC COH π	BS; Finite mass; - BergerSehgalFMCOHPiPXSec2015/Default
CC/NC DFR π	ReinDFRPXSec/Default
ΔS=1 CC QE	none
ΔS=1 CC INEL	none
ΔC=1 CC QE	Kovalenko model - KovalenkoQELCharmPXSec/Default
ΔC=1 CC INEL	AOT - AivazisCharmPXSecLO/CC-Default
TRM	Resonances for W $<$ 1.7 GeV, NRB from BY extrapolation with NeuGen tuning
RDEC	Phase space
HDRZ	AGKY
FSI	INTRANUKE2015/hA - HAIntranuke2015/Default

Table 7: **G16_02b**

INS	LFG; - LocalFGM/Default
NC EL	Ahrens model; dipole axial FF with with M_A = 0.99 GeV^2; strange axial FF contribution η=0.12 - AhrensNCELPXSec/Default
CC QE	VQE; BBA05 elastic FF; dipole axial FF with M_A = 0.99 GeV^2 - NievesQELCCPXSec/Default
CC/NC 2p2h	VnN model - NievesSimoVacasMECPXSec2016/Default
CC/NC RES	BS; dipole axial FF with with M_A = 0.84 GeV^2; 16 resonances; no inteference; - BergerSehgalRESPXSec2014/Default
CC/NC DIS	BY, scaling factor = 1.032 - QPMDISPXSec/Default
CC/NC COH π	BS; Finite mass; - BergerSehgalFMCOHPiPXSec2015/Default
CC/NC DFR π	ReinDFRPXSec/Default
ΔS=1 CC QE	none
ΔS=1 CC INEL	none
ΔC=1 CC QE	Kovalenko model - KovalenkoQELCharmPXSec/Default
ΔC=1 CC INEL	AOT - AivazisCharmPXSecLO/CC-Default
TRM	Resonances for W $<$ 1.7 GeV, NRB from BY extrapolation with NeuGen tuning
RDEC	Phase space
HDRZ	AGKY
FSI	INTRANUKE2015/hN - HNIntranuke2015/Default

3 Qualitative characterization

Level of agreement	(Color) Code
Excellent	5
Good	4
Modest	3
Poor	2
Huh ??	1
Not assessed	
Production Errors	0

Table 8: Qualitative Characterization of GENIE CMCs - Summary Table

	Configuration				
Dataset	G00_00a	G00_00b	G16_01a	G16_02a	G16_02b
Integrated neutrino cross-section data					
$\sigma(\nu_\mu$ CC inclusive); bubble chamber data; $E_\nu < 2$ GeV	4		4	4	
$\sigma(\nu_\mu$ CC inclusive); bubble chamber data; $2 < E_\nu < 10$ GeV	4		4	4	
$\sigma(\nu_\mu$ CC inclusive); bubble chamber data; $E_\nu > 10$ GeV	4				
$\sigma(\bar{\nu}_\mu$ CC inclusive); bubble chamber data; $E_\nu < 2$ GeV	4		4	3	
$\sigma(\bar{\nu}_\mu$ CC inclusive); bubble chamber data; $2 < E_\nu < 10$ GeV	3		3	2	
$\sigma(\bar{\nu}_\mu$ CC inclusive); bubble chamber data; $E_\nu > 10$ GeV	4		4	3	
$\sigma(\nu_\mu$ CC inclusive); MINOS; $E_\nu < 10$GeV	5		5	4	
$\sigma(\nu_\mu$ CC inclusive); MINOS; $10 < E_\nu < 20$ GeV	5		5	4	
$\sigma(\nu_\mu$ CC inclusive); MINOS; $E_\nu > 20$ GeV	5		5	4	
$\sigma(\bar{\nu}_\mu$ CC inclusive); MINOS; $E_\nu < 10$GeV	4		4	1	
$\sigma(\bar{\nu}_\mu$ CC inclusive); MINOS; $10 < E_\nu < 20$ GeV	5		4	1	
$\sigma(\bar{\nu}_\mu$ CC inclusive); MINOS; $E_\nu > 20$ GeV	4		4	2	
$\sigma(\bar{\nu}_\mu$ CC inclusive)/$\sigma(\nu_\mu$ CC inclusive); MINOS; $E_\nu < 10$ GeV	3				
$\sigma(\bar{\nu}_\mu$ CC inclusive)/$\sigma(\nu_\mu$ CC inclusive); MINOS; $10 < E_\nu < 20$ GeV	4				
$\sigma(\bar{\nu}_\mu$ CC inclusive)/$\sigma(\nu_\mu$ CC inclusive); MINOS; $E_\nu > 20$ GeV	4				
$\sigma(\nu_\mu$ CC inclusive); SciBooNE; $E_\nu < 1$ GeV	4		4	4	
$\sigma(\nu_\mu$ CC inclusive); SciBooNE; $E_\nu > 1$ GeV	4		4	4	
$\sigma(\nu_\mu$ CCQE); bubble chamber data; $E_\nu < 2$ GeV	4				
$\sigma(\nu_\mu$ CCQE); bubble chamber data; $E_\nu > 2$ GeV	4				
$\sigma(\bar{\nu}_\mu$ CCQE); bubble chamber data	4				

$\sigma(\nu_\mu$ CCQE); LSND	2		0	0	
$\sigma(\nu_\mu$ CCQE); MiniBooNE (0.4 < E_ν < 2 GeV)	3		0	0	
$\sigma(\nu_\mu$ CCQE); NOMAD (E_ν > 3 GeV)	4		0	0	
$\sigma(\bar{\nu}_\mu$ CCQE); NOMAD (E_ν > 3 GeV)	4		0	0	
$\sigma(\nu_\mu$ CC1π^+; $\nu_\mu p \to \mu^- p \pi^+$); bubble chamber data	3		3	3	
$\sigma(\nu_\mu$ CC1π^+; $\nu_\mu n \to \mu^- n \pi^+$); bubble chamber data	2		1	1	
$\sigma(\nu_\mu$ CC1π^0; $\nu_\mu n \to \mu^- p \pi^0$); bubble chamber data	2				
$\sigma(\nu_\mu$ CC2π^+; $\nu_\mu p \to \mu^- n \pi^+ \pi^+$); bubble chamber data	3		1	1	
$\sigma(\nu_\mu$ CC$\pi^+\pi^0$; $\nu_\mu p \to \mu^- p \pi^+ \pi^0$); bubble chamber data	4		4	4	
$\sigma(\nu_\mu$ CC$\pi^+\pi^-$; $\nu_\mu n \to \mu^- p \pi^+ \pi^-$); bubble chamber data	3		4	4	
$\sigma(\nu_\mu$ CCπ^0)/$\sigma(\nu_\mu$ CCQE); K2K	3				
$\sigma(\nu_\mu$ CC1π^+); MiniBooNE	4				
$\sigma(\nu_\mu$ CC1π^0); MiniBooNE					
$\sigma(\nu_\mu$ NC coherent π^0); Ne^{20}	5				
$\sigma(\nu_\mu$ NC coherent π^0); Al^{27}	4		4	3	
$\sigma(\nu_\mu$ NC coherent π^0); Si^{30}	5		5	4	
$\sigma(\nu_\mu$ CC coherent π^+); Ne^{20}	4		4	3	
$\sigma(\nu_\mu$ CC coherent π^+); Si^{30}	4		4	3	
$\sigma(\bar{\nu}_\mu$ CC coherent π^-); Ne^{20}	4		4	4	
$\sigma(\bar{\nu}_\mu$ CC coherent π^-); Si^{30}	4		4	4	
Differential neutrino cross-section data					
$d^2\sigma(\nu_\mu$ CC 0π) / dcosθ_μdT_μ; MiniBooNE; 0.2 < T_μ < 0.3 GeV	2		1	5	
$d^2\sigma(\nu_\mu$ CC 0π) / dcosθ_μdT_μ; MiniBooNE; 0.3 < T_μ < 0.4 GeV	3		2	4	
$d^2\sigma(\nu_\mu$ CC 0π) / dcosθ_μdT_μ; MiniBooNE; 0.4 < T_μ < 0.5 GeV	3		2	4	
$d^2\sigma(\nu_\mu$ CC 0π) / dcosθ_μdT_μ; MiniBooNE; 0.5 < T_μ < 0.6 GeV	3		2	5	
$d^2\sigma(\nu_\mu$ CC 0π) / dcosθ_μdT_μ; MiniBooNE; 0.6 < T_μ < 0.7 GeV	3		3	4	
$d^2\sigma(\nu_\mu$ CC 0π) / dcosθ_μdT_μ; MiniBooNE; 0.7 < T_μ < 0.8 GeV	3		2	4	
$d^2\sigma(\nu_\mu$ CC 0π) / dcosθ_μdT_μ; MiniBooNE; 0.8 < T_μ < 0.9 GeV	4		4	5	
$d^2\sigma(\nu_\mu$ CC 0π) / dcosθ_μdT_μ; MiniBooNE; 0.9 < T_μ < 1.0 GeV	4		4	5	
$d^2\sigma(\nu_\mu$ CC 0π) / dcosθ_μdT_μ; MiniBooNE; 1.0 < T_μ < 1.1 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC 0π) / dcosθ_μdT_μ; MiniBooNE; 1.1 < T_μ < 1.2 GeV	4		4	4	

$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.2 < T$_\mu$ < 1.3 GeV	5		5	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.3 < T$_\mu$ < 1.4 GeV	5		4	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.4 < T$_\mu$ < 1.5 GeV	5		5	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.5 < T$_\mu$ < 1.6 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.6 < T$_\mu$ < 1.7 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.7 < T$_\mu$ <1.8 GeV	4		5	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.8 < T$_\mu$ < 1.9 GeV	5		5	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.9 < T$_\mu$ < 2.0 GeV	5		5	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -1.0 < cosθ_μ < -0.9	3		3	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.9 < cosθ_μ < -0.8	2		3	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.8 < cosθ_μ < -0.7	2		2	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.7 < cosθ_μ < -0.6	2		2	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.6 < cosθ_μ < -0.5	3		3	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.5 < cosθ_μ < -0.4	2		1	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.4 < cosθ_μ < -0.3	2		3	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.3 < cosθ_μ < -0.2	3		3	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.2 < cosθ_μ < -0.1	3		2	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.1 < cosθ_μ < 0	3		2	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0 < cosθ_μ < 0.1	3		2	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.1 < cosθ_μ < 0.2	3		2	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.2 < cosθ_μ < 0.3	3		2	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.3 < cosθ_μ < 0.4	3		2	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.4 < cosθ_μ < 0.5	3		2	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.5 < cosθ_μ < 0.6	3		2	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.6 < cosθ_μ < 0.7	3		2	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.7 < cosθ_μ < 0.8	4		3	5	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.8 < cosθ_μ < 0.9	4		4	4	
$d^2\sigma(\nu_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.9 < cosθ_μ < 1.0	4		4	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.2 < T$_\mu$ < 0.3 GeV	4		2	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.3 < T$_\mu$ < 0.4 GeV	2		4	4	

$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.4 < T$_\mu$ < 0.5 GeV	4		2	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.5 < T$_\mu$ < 0.6 GeV	4		2	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.6 < T$_\mu$ < 0.7 GeV	4		2	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.7 < T$_\mu$ < 0.8 GeV	4		2	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.8 < T$_\mu$ < 0.9 GeV	4		2	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.9 < T$_\mu$ < 1.0 GeV	4		2	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.0 < T$_\mu$ < 1.1 GeV	4		2	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.1 < T$_\mu$ < 1.2 GeV	4		2	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.2 < T$_\mu$ < 1.3 GeV	4		2	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.3 < T$_\mu$ < 1.4 GeV	4		2	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.4 < T$_\mu$ < 1.5 GeV	4		3	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.5 < T$_\mu$ < 1.6 GeV	4		3	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.6 < T$_\mu$ < 1.7 GeV	4		4	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.7 < T$_\mu$ < 1.8 GeV					
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.8 < T$_\mu$ < 1.9 GeV					
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.9 < T$_\mu$ < 2.0 GeV					
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -1.0 < cosθ_μ < -0.9					
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.9 < cosθ_μ < -0.8					
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.8 < cosθ_μ < -0.7					
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.7 < cosθ_μ < -0.6					
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.6 < cosθ_μ < -0.5	4		4	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.5 < cosθ_μ < -0.4	4		4	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.4 < cosθ_μ < -0.3	4		4	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.3 < cosθ_μ < -0.2	4		4	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.2 < cosθ_μ < -0.1	4		3	3	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.1 < cosθ_μ < 0.0	4		3	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.0 < cosθ_μ < 0.1	4		4	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.1 < cosθ_μ < 0.2	4		3	5	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.2 < cosθ_μ < 0.3	4		3	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.3 < cosθ_μ < 0.4	4		3	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.4 < cosθ_μ < 0.5	4		3	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.5 < cosθ_μ < 0.6	3		2	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.6 < cosθ_μ < 0.7	3		2	4	

$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.7 < cosθ_μ < 0.8	4		2	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.8 < cosθ_μ < 0.9	4		2	4	
$d^2\sigma(\bar{\nu}_\mu$ CC $0\pi)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.9 < cosθ_μ < 1.0	4		2	3	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.15 < T$_\mu$ < 0.20 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.20 < T$_\mu$ < 0.25 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.25 < T$_\mu$ < 0.30 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.30 < T$_\mu$ < 0.35 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.35 < T$_\mu$ < 0.40 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.40 < T$_\mu$ < 0.45 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.45 < T$_\mu$ < 0.50 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.50 < T$_\mu$ < 0.55 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.55 < T$_\mu$ < 0.60 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.60 < T$_\mu$ < 0.65 GeV	4		4	5	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.65 < T$_\mu$ < 0.70 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.70 < T$_\mu$ < 0.75 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.75 < T$_\mu$ < 0.80 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.80 < T$_\mu$ < 0.85 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.85 < T$_\mu$ < 0.90 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.90 < T$_\mu$ < 0.95 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.95 < T$_\mu$ < 1.00 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.05 < T$_\mu$ < 1.10 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.10 < T$_\mu$ < 1.20 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 1.20 < T$_\mu$ < 1.50 GeV	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; -1.00 < cosθ_μ < -0.80	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.80 < cosθ_μ < -0.60	5		5	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.60 < cosθ_μ < -0.50	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.50 < cosθ_μ < -0.40	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.40 < cosθ_μ < -0.30	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.30 < cosθ_μ < -0.20	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.20 < cosθ_μ < -0.10	4		4	4	

$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.10 < cosθ_μ < -0.05	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; -0.05 < cosθ_μ < 0.00	5		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.00 < cosθ_μ < 0.05	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.05 < cosθ_μ < 0.1	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.10 < cosθ_μ < 0.15	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.15 < cosθ_μ < 0.20	5		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.20 < cosθ_μ < 0.25	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.25 < cosθ_μ < 0.30	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.30 < cosθ_μ < 0.35	4		5	5	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.35 < cosθ_μ < 0.40	5		4	5	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.40 < cosθ_μ < 0.45	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.45 < cosθ_μ < 0.50	4		5	5	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.50 < cosθ_μ < 0.55	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.55 < cosθ_μ < 0.60	5		4	5	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.60 < cosθ_μ < 0.65	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.65 < cosθ_μ < 0.70	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.70 < cosθ_μ < 0.75	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.75 < cosθ_μ < 0.80	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.80 < cosθ_μ < 0.85	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.85 < cosθ_μ < 0.90	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.90 < cosθ_μ < 0.95	4		4	4	
$d^2\sigma(\nu_\mu$ CC $1\pi^+)$ / dcosθ_μdT$_\mu$; MiniBooNE; 0.95 < cosθ_μ < 1.00	4		4	4	
$d\sigma(\nu_\mu$ CC $1\pi^0)$ / dcosθ_μ; MiniBooNE	2		2	3	
$d\sigma(\nu_\mu$ CC $1\pi^0)$ / dcosθ_{π^0}; MiniBooNE	4		4	3	
$d\sigma(\nu_\mu$ CC $1\pi^0)$ / dp$_{\pi^0}$; MiniBooNE	3		2	2	
$d\sigma(\nu_\mu$ CC $1\pi^0)$ / dQ^2; MiniBooNE	3		3	4	
$d\sigma(\nu_\mu$ CC $1\pi^0)$ / dT$_\mu$; MiniBooNE	4		5	4	
$d\sigma(\nu$ NC $1\pi^0)$ / dcosθ_{π^0}; MiniBooNE	4	4		3	
$d\sigma(\nu$ NC $1\pi^0)$ / dp$_{\pi^0}$; MiniBooNE	4	4		3	
$d\sigma(\bar{\nu}$ NC $1\pi^0)$ / dcosθ_{π^0}; MiniBooNE	3	3		1	

$d\sigma(\bar{\nu}$ NC $1\pi^0)$ / dp_{π^0}; MiniBooNE	4	4		2	
$d^2\sigma(\nu$ CC $0\pi)$ / $d\cos\theta_\mu$ / dP_μ; T2K ND280					
$d^2\sigma(\nu$ CC $)$ / $d\cos\theta_\mu$ / dP_μ; T2K ND280; 0 GeV $< P_\mu <$ 0.4 GeV	4		3	4	
$d^2\sigma(\nu$ CC $)$ / $d\cos\theta_\mu$ / dP_μ; T2K ND280; 0.4 GeV $< P_\mu <$ 0.5 GeV	4		2	3	
$d^2\sigma(\nu$ CC $)$ / $d\cos\theta_\mu$ / dP_μ; T2K ND280; 0.5 GeV $< P_\mu <$ 0.7 GeV	4		2	3	
$d^2\sigma(\nu$ CC $)$ / $d\cos\theta_\mu$ / dP_μ; T2K ND280; 0.7 GeV $< P_\mu <$ 0.9 GeV	4		3	4	
$d^2\sigma(\nu$ CC $)$ / $d\cos\theta_\mu$ / dP_μ; T2K ND280; 0.9 GeV $< P_\mu <$ 30 GeV	3		2	4	
$d^2\sigma(\nu$ CC $)$ / $d\cos\theta_\mu$ / dP_μ; T2K ND280; $0 < \cos\theta_\mu < 0.84$	4		2	4	
$d^2\sigma(\nu$ CC $)$ / $d\cos\theta_\mu$ / dP_μ; T2K ND280; $0.84 < \cos\theta_\mu < 0.9$	4		2	3	
$d^2\sigma(\nu$ CC $)$ / $d\cos\theta_\mu$ / dP_μ; T2K ND280; $0.9 < \cos\theta_\mu < 0.94$	4		3	3	
$d^2\sigma(\nu$ CC $)$ / $d\cos\theta_\mu$ / dP_μ; T2K ND280; $0.94 < \cos\theta_\mu < 1$	4		3	2	
Data on neutrino-induced hadron shower characteristics					
$<n_{ch}>$ vs W^2; νp CC; all x_F; W < 3 GeV	5			5	
$<n_{ch}>$ vs W^2; νp CC; all x_F; W > 3 GeV	4			5	
$<n_{ch}>$ vs W^2; νn CC; all x_F; W < 3 GeV	5			5	
$<n_{ch}>$ vs W^2; νn CC; all x_F; W > 3 GeV	4			4	
$<n_{ch}>$ vs W^2; νp CC; x_F>0; W < 3 GeV	5			5	
$<n_{ch}>$ vs W^2; νp CC; x_F>0; W > 3 GeV	4			5	
$<n_{ch}>$ vs W^2; νp CC; x_F<0; W < 3 GeV	5			5	
$<n_{ch}>$ vs W^2; νp CC; x_F<0; W > 3 GeV	5			5	
$<n_{ch}>$ vs W^2; νn CC; x_F>0; W < 3 GeV	4			4	
$<n_{ch}>$ vs W^2; νn CC; x_F>0; W > 3 GeV	4			5	
$<n_{ch}>$ vs W^2; νn CC; x_F<0; W < 3 GeV	4			4	
$<n_{ch}>$ vs W^2; νn CC; x_F<0; W > 3 GeV	5			5	
$<n_{ch}>$ vs W^2; $\bar{\nu}$p CC; all x_F; W < 3 GeV	5			5	
$<n_{ch}>$ vs W^2; $\bar{\nu}$p CC; all x_F; W > 3 GeV	4			4	
$<n_{ch}>$ vs W^2; $\bar{\nu}$p CC; x_F>0; W < 3 GeV	3			3	
$<n_{ch}>$ vs W^2; $\bar{\nu}$p CC; x_F>0; W > 3 GeV	4			4	
$<n_{ch}>$ vs W^2; $\bar{\nu}$p CC; x_F<0; W < 3 GeV	5			5	
$<n_{ch}>$ vs W^2; $\bar{\nu}$p CC; x_F<0; W > 3 GeV	4			5	
$<n_{\pi^0}>$ vs W^2; νH_2 and νFreon CC; all x_F; W < 3 GeV	4			5	

<n_{π^0}> vs W^2; νH_2 and νFreon CC; all x_F; W > 3 GeV	5			5	
<n_{π^0}> vs W^2; $\bar{\nu}$p CC; all x_F; W < 3 GeV	4			4	
<n_{π^0}> vs W^2; $\bar{\nu}$p CC; all x_F; W > 3 GeV	4			5	
<n_η> vs W; νp CC; all x_F; W < 3 GeV	4			1	
<n_η> vs W; νp CC; all x_F; W > 3 GeV	3			1	
<n_η> vs W; νp CC; x_F>0; W < 3 GeV	4			1	
<n_η> vs W; νp CC; x_F>0; W > 3 GeV	2			1	
D_- vs <n_->; νD_2 CC	4			3	
D_{ch}/<n_{ch}> vs W^2, νp CC; W < 3 GeV	4			4	
D_{ch}/<n_{ch}> vs W^2, νp CC; W > 3 GeV	5			3	
D_{ch}/<n_{ch}> vs W^2, νn CC; W < 3 GeV	4			3	
D_{ch}/<n_{ch}> vs W^2, νn CC; W > 3 GeV	3			2	
D_- vs <n_->; $\bar{\nu}H_2$ CC	5			5	
<n_{π^0}> vs n_-; νH_2 CC; 3 < W < 4 GeV	4			4	
<n_{π^0}> vs n_-; νH_2 CC; 4 < W < 5 GeV	5			5	
<n_{π^0}> vs n_-; νH_2 CC; 5 < W < 7 GeV	5			5	
<n_{π^0}> vs n_-; νH_2 CC; 7 < W < 10 GeV	5			5	
Norm. topological cross-sections; νp CC; n_{ch} = 2; W < 3 GeV	5			5	
Norm. topological cross-sections; νp CC; n_{ch} = 2; W > 3 GeV	4			4	
Norm. topological cross-sections; νp CC; n_{ch} = 4; W < 3 GeV	4			5	
Norm. topological cross-sections; νp CC; n_{ch} = 4; W > 3 GeV	5			5	
Norm. topological cross-sections; νp CC; n_{ch} > 4; W < 3 GeV				4	
Norm. topological cross-sections; νp CC; n_{ch} > 4; W > 3 GeV	3			4	
Norm. topological cross-sections; νn CC; n_{ch} = 1; W < 3 GeV	4			4	
Norm. topological cross-sections; νn CC; n_{ch} = 1; W > 3 GeV	5			4	
Norm. topological cross-sections; νn CC; n_{ch} = 3; W < 3 GeV	4			4	
Norm. topological cross-sections; νn CC; n_{ch} = 3; W > 3 GeV	4			5	
Norm. topological cross-sections; νn CC; n_{ch} > 3; W < 3 GeV				4	
Norm. topological cross-sections; νn CC; n_{ch} > 3; W > 3 GeV	3			4	
Norm. topological cross-sections; $\bar{\nu}H_2$ CC; n_{ch} = 0; W < 3 GeV	5			5	

Norm. topological cross-sections; $\bar{\nu}H_2$ CC; n_{ch} = 0; W > 3 GeV	4		4	
Norm. topological cross-sections; $\bar{\nu}H_2$ CC; n_{ch} = 2; W < 3 GeV	5		5	
Norm. topological cross-sections; $\bar{\nu}H_2$ CC; n_{ch} = 2; W > 3 GeV	4		4	
Norm. topological cross-sections; $\bar{\nu}H_2$ CC; n_{ch} = 4; W < 3 GeV			5	
Norm. topological cross-sections; $\bar{\nu}H_2$ CC; n_{ch} = 4; W > 3 GeV	5		5	
Norm. topological cross-sections; $\bar{\nu}H_2$ CC; n_{ch} > 4; W < 3 GeV			3	
Norm. topological cross-sections; $\bar{\nu}H_2$ CC; n_{ch} > 4; W > 3 GeV	2		4	
KNO scaling: $<n_{ch}>P(n_{ch})$ vs $n_{ch}/<n_{ch}>$; νp CC	5		2	
KNO scaling: $<n_{ch}>P(n_{ch})$ vs $n_{ch}/<n_{ch}>$; νn CC	5		5	
z distribution; h^+ from νD_2 CC; z < 0.2	5		5	
z distribution; h^+ from νD_2 CC; 0.2 < z < 0.7	4		5	
z distribution; h^+ from νD_2 CC; z > 0.7	4		4	
z distribution; h^- from νD_2 CC; z < 0.2	4		5	
z distribution; h^- from νD_2 CC; 0.2 < z < 0.7	4		5	
z distribution; h^- from νD_2 CC; z > 0.7	4		4	
z distribution; $h^\pm$ from $\bar{\nu}H_2$ CC; z < 0.2; E_ν < 15 GeV	4		5	
z distribution; $h^\pm$ from $\bar{\nu}H_2$ CC; z > 0.2; E_ν < 15 GeV	4		4	
z distribution; $h^\pm$ from $\bar{\nu}H_2$ CC; z < 0.2; 15 < E_ν < 30 GeV	5		5	
z distribution; $h^\pm$ from $\bar{\nu}H_2$ CC; z > 0.2; 15 < E_ν < 30 GeV	5		4	
z distribution; $h^\pm$ from $\bar{\nu}H_2$ CC; z < 0.2; E_ν > 30 GeV	4		4	
z distribution; $h^\pm$ from $\bar{\nu}H_2$ CC; z > 0.2; E_ν > 30 GeV	5		4	
x_F distribution; π^+ from νp CC; x_F > 0; W > 3 GeV	3		3	
x_F distribution; π^+ from νp CC; x_F < 0; W > 3 GeV	3		4	
x_F distribution; π^- from νp CC; x_F > 0; W > 3 GeV	5		5	
x_F distribution; π^- from νp CC; x_F < 0; W > 3 GeV	4		4	
x_F distribution; π^+ from $\bar{\nu}H_2$ and $\bar{\nu}D_2$ CC; x_F > 0	3		4	
x_F distribution; π^+ from $\bar{\nu}H_2$ and $\bar{\nu}D_2$ CC; x_F < 0	4		4	
x_F distribution; π^- from $\bar{\nu}H_2$ and $\bar{\nu}D_2$ CC; x_F > 0	2		3	
x_F distribution; π^- from $\bar{\nu}H_2$ and $\bar{\nu}D_2$ CC; x_F < 0	4		3	
x_F distribution; h^+ from $\bar{\nu}H_2$ CC; x_F > 0; 2 < W < 4 GeV; Q^2 < 45 GeV^2	2		2	

x_F distribution; h^+ from $\bar{\nu}H_2$ CC; $x_F < 0$; $2 < W < 4$ GeV; $Q^2 < 45$ GeV^2	3			4	
x_F distribution; h^+ from $\bar{\nu}H_2$ CC; $x_F > 0$; $4 < W < 10$ GeV; $Q^2 < 45$ GeV^2	4			4	
x_F distribution; h^+ from $\bar{\nu}H_2$ CC; $x_F < 0$; $4 < W < 10$ GeV; $Q^2 < 45$ GeV^2	3			3	
x_F distribution; h^- from $\bar{\nu}H_2$ CC; $x_F > 0$; $2 < W < 4$ GeV; $Q^2 < 45$ GeV^2	2			3	
x_F distribution; h^- from $\bar{\nu}H_2$ CC; $x_F < 0$; $2 < W < 4$ GeV; $Q^2 < 45$ GeV^2	3			3	
x_F distribution; h^- from $\bar{\nu}H_2$ CC; $x_F > 0$; $4 < W < 10$ GeV; $Q^2 < 45$ GeV^2	2			2	
x_F distribution; h^- from $\bar{\nu}H_2$ CC; $x_F < 0$; $4 < W < 10$ GeV; $Q^2 < 45$ GeV^2	4			2	
$<p_T^2>$ vs W^2; νD_2 CC; $x_F < 0.3$; $W^2 < 9GeV^2$	4			5	
$<p_T^2>$ vs W^2; νD_2 CC; $x_F < 0.3$; $W^2 > 9GeV^2$	4			3	
$<p_T^2>$ vs W^2; νD_2 CC; $x_F > 0.3$; $W^2 < 9GeV^2$	4			4	
$<p_T^2>$ vs W^2; νD_2 CC; $x_F > 0.3$; $W^2 > 9GeV^2$	1			4	
$<p_T^2>$ vs W; $\bar{\nu}p$ CC; all x_F; $W < 3$ GeV	2			3	
$<p_T^2>$ vs W; $\bar{\nu}p$ CC; all x_F; $W > 3$ GeV	5			4	
$<p_T^2>$ vs W; $\bar{\nu}p$ CC; $x_F > 0$; $W < 3$ GeV	2			2	
$<p_T^2>$ vs W; $\bar{\nu}p$ CC; $x_F > 0$; $W > 3$ GeV	4			3	
$<p_T^2>$ vs W; $\bar{\nu}p$ CC; $x_F < 0$; $W < 3$ GeV	2			2	
$<p_T^2>$ vs W; $\bar{\nu}p$ CC; $x_F < 0$; $W > 3$ GeV	4			4	
$<p_T^2>$ vs x_F; νp CC; $x_F < 0$; $9 < W^2 < 25$ GeV^2	4			3	
$<p_T^2>$ vs x_F; νp CC; $x_F > 0$; $9 < W^2 < 25$ GeV^2	3			4	
$<p_T^2>$ vs x_F; νn CC; $x_F < 0$; $9 < W^2 < 25$ GeV^2	3			4	
$<p_T^2>$ vs x_F; νn CC; $x_F > 0$; $9 < W^2 < 25$ GeV^2	4			3	

4 Quantitative characterization

TODO

		Configurations			
Datasets	**DoF**	**G00_00a**	**G00_00b**	**G16_01a**	**G16_02b**
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu$	137	599		1.02e+03	299
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.05$	5	35.8		66.4	12
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.15$	5	30.3		52.4	15.6
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.25$	4	24.3		55.5	11.9
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.35$	3	40.8		54.2	16
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.45$	3	22.1		60.2	14.1
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.55$	3	20.8		41.5	12.6
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.65$	3	22.5		46.7	8.06
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.75$	2	20.2		29	16.7
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.85$	2	22.5		39.3	12.5
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.95$	2	20.1		18	5.45
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.05$	5	27.3		66.5	12.1
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.15$	6	23.1		45.6	19.3
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.25$	7	42		76.1	4.64
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.35$	7	36		65.3	14.1
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.45$	9	33.8		65.3	16.7
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.55$	11	37.7		69.9	18.2
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.65$	12	40.2		69.4	20.1
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.75$	14	33.5		46.5	27.5
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.85$	16	23.1		23.5	17.6
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.95$	18	42.2		32.1	23.5
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.25GeV$	20	192		435	45.5
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.35GeV$	20	104		200	68.5
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.45GeV$	17	89.6		134	53.3
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.55GeV$	13	73.3		100	25.9
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.65GeV$	12	49.4		60	17.2
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.75GeV$	9	26.8		33.8	23.5
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.85GeV$	8	26.5		26.2	15.1
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.95GeV$	6	17.9		15.3	10.3
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.05GeV$	6	7.31		8.5	9.82
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.15GeV$	5	6.56		5.13	6.34
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.25GeV$	5	2.92		3.7	8.47
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.35GeV$	4	0.467		0.342	6.29
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.45GeV$	3	0.277		0.106	5.16
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.55GeV$	3	0.905		0.353	1.54
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.65GeV$	2	0.318		0.274	1.26
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.75GeV$	2	0.27		0.0862	0.54
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.85GeV$	1	0.0477		0.00915	0.142
$\partial^2\sigma(\nu_\mu CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.95GeV$	1	0.0124		0.0292	0.0726

$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu$	78	163	105	916	193
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.05$	2	1.63	2	5.06	2.82
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.15$	2	1.06	0.101	2.55	1.49
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.25$	1	0.181	0.264	0.366	0.124
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.35$	1	0.198	0.0541	0.0114	0.397
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.45$	1	0.915	0.104	0.819	0.626
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.55$	1	0.824	2.14e-05	0.6	0.63
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.65$	0	0	0	0	0
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.75$	0	0	0	0	0
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.85$	0	0	0	0	0
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = -0.95$	0	0	0	0	0
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.05$	3	1.67	0.159	4.14	2.74
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.15$	3	1.73	1.61	5.58	1.02
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.25$	4	2.35	1.98	8.22	2.89
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.35$	5	4.2	1.13	23.5	5.43
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.45$	5	9.76	0.782	32.8	7.24
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.55$	6	20.2	2.76	71	13
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.65$	8	17.3	8.1	108	11.1
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.75$	9	36.8	15.9	161	19.7
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.85$	12	42.8	22.2	238	42.6
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu Cos\theta_\mu = 0.95$	15	21.2	47.6	254	80.9
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.25GeV$	16	13.7	11.6	61.2	27.8
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.35GeV$	12	14.1	23.8	82.1	14.4
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.45GeV$	10	19.6	13.7	116	15.8
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.55GeV$	8	19.6	10.5	134	17.8
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.65GeV$	7	18.2	11.9	114	20.2
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.75GeV$	5	24.9	11.1	119	15.1
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.85GeV$	4	16.7	7.04	97.5	21.7
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 0.95GeV$	4	12	7.96	80.5	18.2
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.05GeV$	3	8.9	2.32	45.3	14
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.15GeV$	2	3.98	0.987	26.2	9.64
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.25GeV$	2	4.05	0.565	18.8	6.45
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.35GeV$	2	2.95	1.8	11.6	4.71
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.45GeV$	1	2.21	0.809	6.5	4.14
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.55GeV$	1	1.53	0.565	3.02	2.11
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.65GeV$	1	0.469	0.189	0.633	0.579
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.75GeV$	0	0	0	0	0
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.85GeV$	0	0	0	0	0
$\partial^2\sigma(\bar{\nu_\mu}CC0\pi)/\partial Cos\theta_\mu/\partial T_\mu T_\mu = 1.95GeV$	0	0	0	0	0

5 Summary

References

A Naming conventions

A uniform naming convention is required for all

1. comprehensive model tunes (CMT),
2. comprehensive model configurations (CMC),
3. estimated (tuned) parameter sets (EPS), and
4. datasets (including their relative weighting) used explicitly for parameter estimation (DPE).

Names should be structured such that, for example,

1. small variations of a given CMC, or
2. different CMT obtained for the same CMC and EPS, but different DPEs

can be easily identified and grouped together.

In addition, names should be *unique*, so that specific CMTs or CMCs can always be referred to without ambiguity, even if they are no longer supported and deployed with the latest version of GENIE.

Although an impossibly large of information needs to be encoded in the names, they should remain reasonably short! Not only a CMT name will be a command-line argument for all GENIE applications[1], a CMC or a CMT name will be the main vehicle for communicating GENIE model configuration and tune information, often verbally[2].

It is rather clear that the names of the actual physics models, or the names of the datasets, can not be a part of a uniform and compact naming scheme. Such a naming scheme can only employ "keys" that can be used by users in order to look up the corresponding model configurations, parameter lists and datasets. It is expected that all this information will be maintained in the GENIE web page, and that the subset of that information pertaining to the currently supported CMTs will be included in the GENIE Physics and Users Manual.

In principle, a CMT is almost fully specified by a CMC and EPS and a DPE, so the CMT names can be structured accordingly.

$$\{\texttt{CMT}\} = \{\texttt{CMC}\}\_\{\texttt{EPS}\}\_\{\texttt{DPE}\}$$

The following naming scheme was chosen:

{CMC} has a name in the form of: `Gdd_MMv`, where

- G: is a capital letter that identifies the maintainer of the model. The default value is `G` (for the GENIE collaboration). To avoid ambiguity, GENIE CMCs and CMTs developed by external groups should use a different naming scheme or, if the same scheme us used, names should start by a character other than `G`.
- dd: is a number describing the year during which a CMC was developed.
- MM: is a number identifying the distinct features of a CMC.
- v: is a character enumerating small variations to a CMC identified by any given number MM.

{EPS} has a name in the form of: `PP`, where

[1] Allowed for via the `-tune` option.

[2] It is desireable to use a name that is not too complex or too long to appear in a plot legend or to effectively address a conference talk question on"Which GENIE tune did you use?".

- PP: is a number identifying the set of parameters that were tuned by the GENIE collaboration. This parameter set is meaningful only in the context of a particular CMC. The number `00` indicates that a CMC has not been tuned by GENIE.

{DPE} has a name in the form of: `xxx`, where

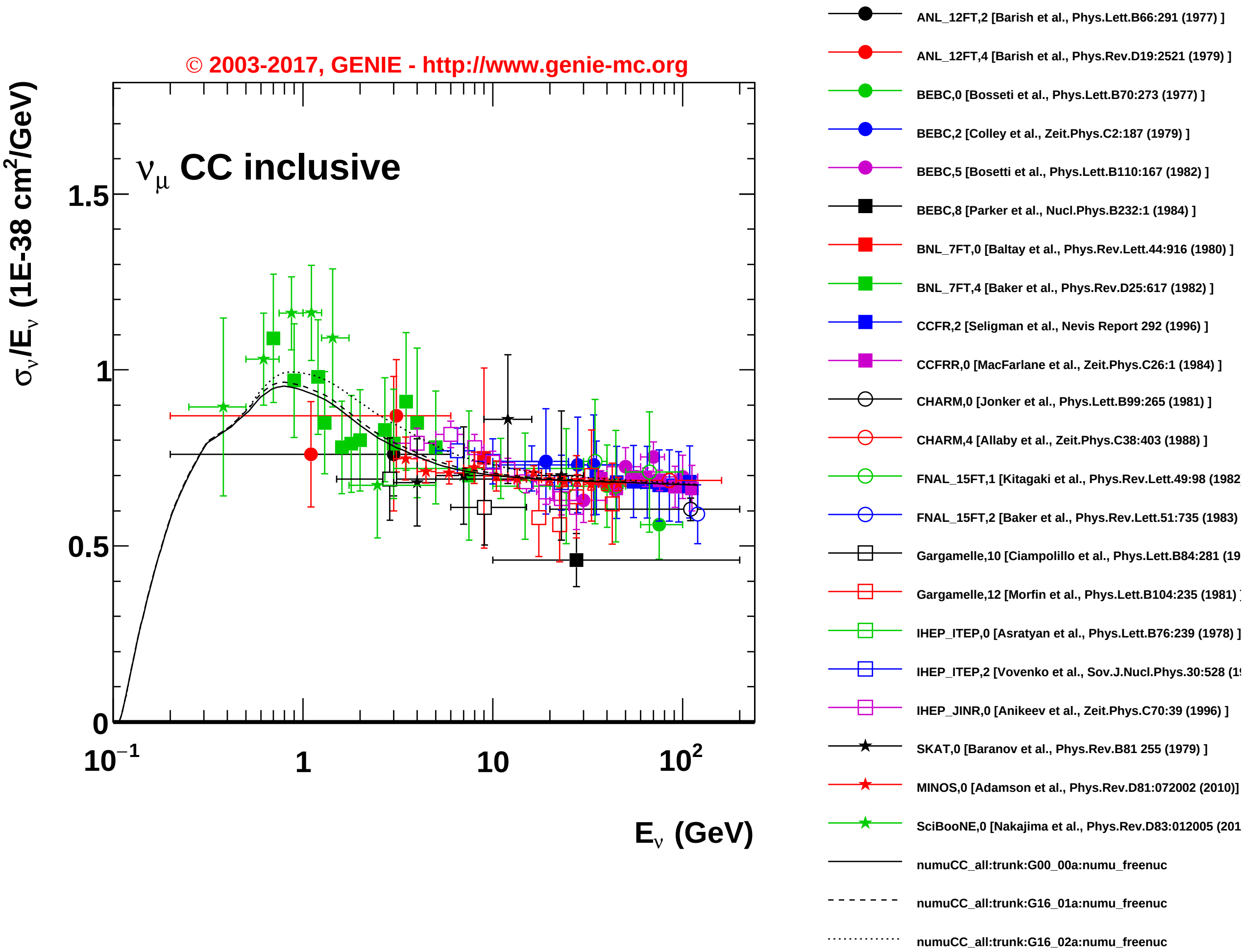
- xxx: is a number that identifies the dataset used to tune the CMC and estimates the values of the given EPS. A given DPE includes a unique set weights associated with each component dataset. The number `000` indicates that a CMC has not been tuned by GENIE.

Therefore, the name of a CMT is a 14-character string of the form:

```
Gdd_MMv_PP_xxx
```

Examples of valid CMT names are `G18_05p_00_000` or `G17_02a_01_024`.

B Supporting data/MC comparisons



© 2003-2017, GENIE - http://www.genie-mc.org
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E_ν (GeV)
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BEBC,2 [Colley et al., Zeit.Phys.C2:187 (1979)]
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CHARM,4 [Allaby et al., Zeit.Phys.C38:403 (1988)]
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SKAT,0 [Baranov et al., Phys.Rev.B81 255 (1979)]
MINOS,0 [Adamson et al., Phys.Rev.D81:072002 (2010)]
SciBooNE,0 [Nakajima et al., Phys.Rev.D83:012005 (201
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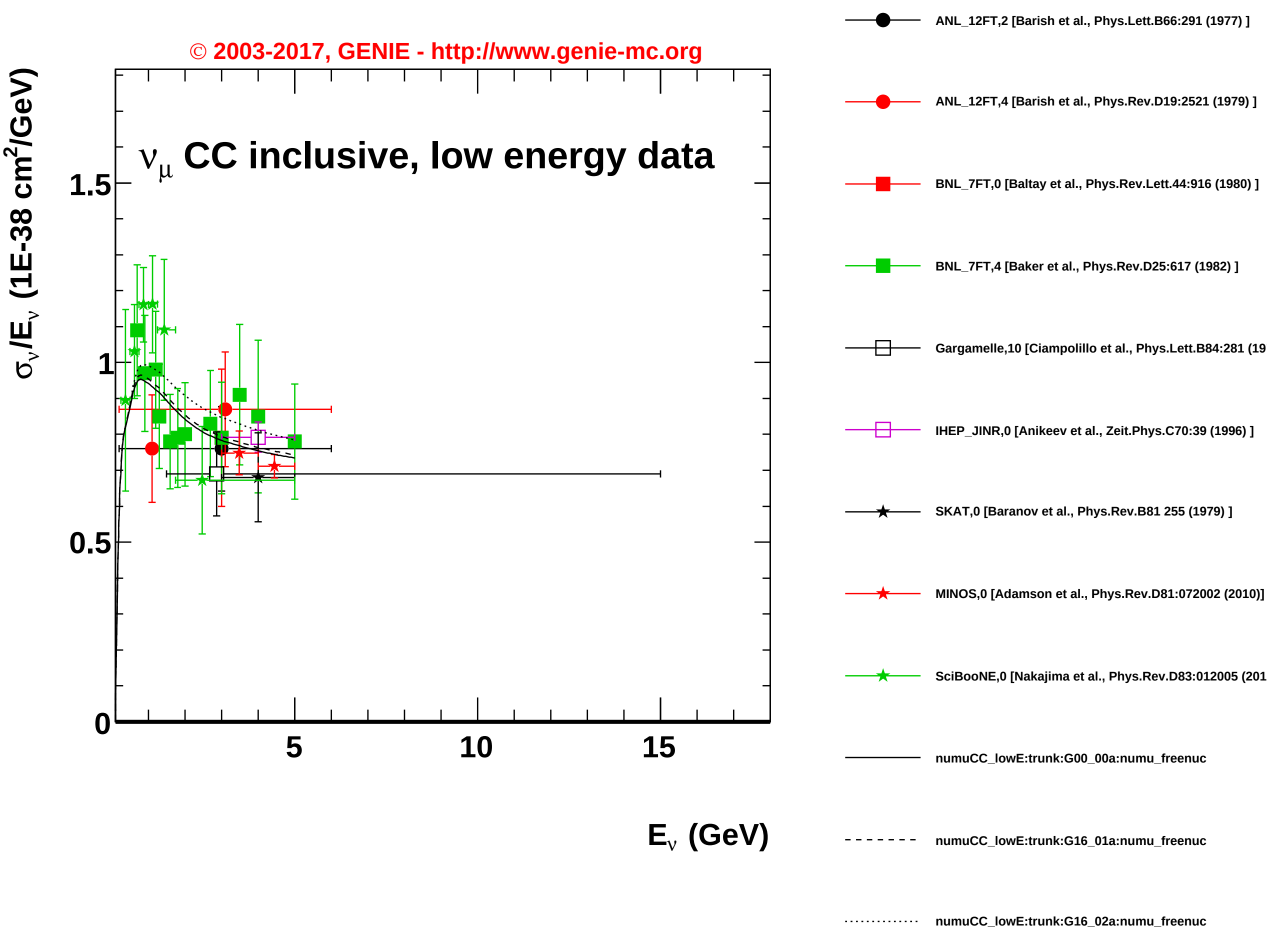

© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive, low energy data
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
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0.5
1
1.5
5
10
15
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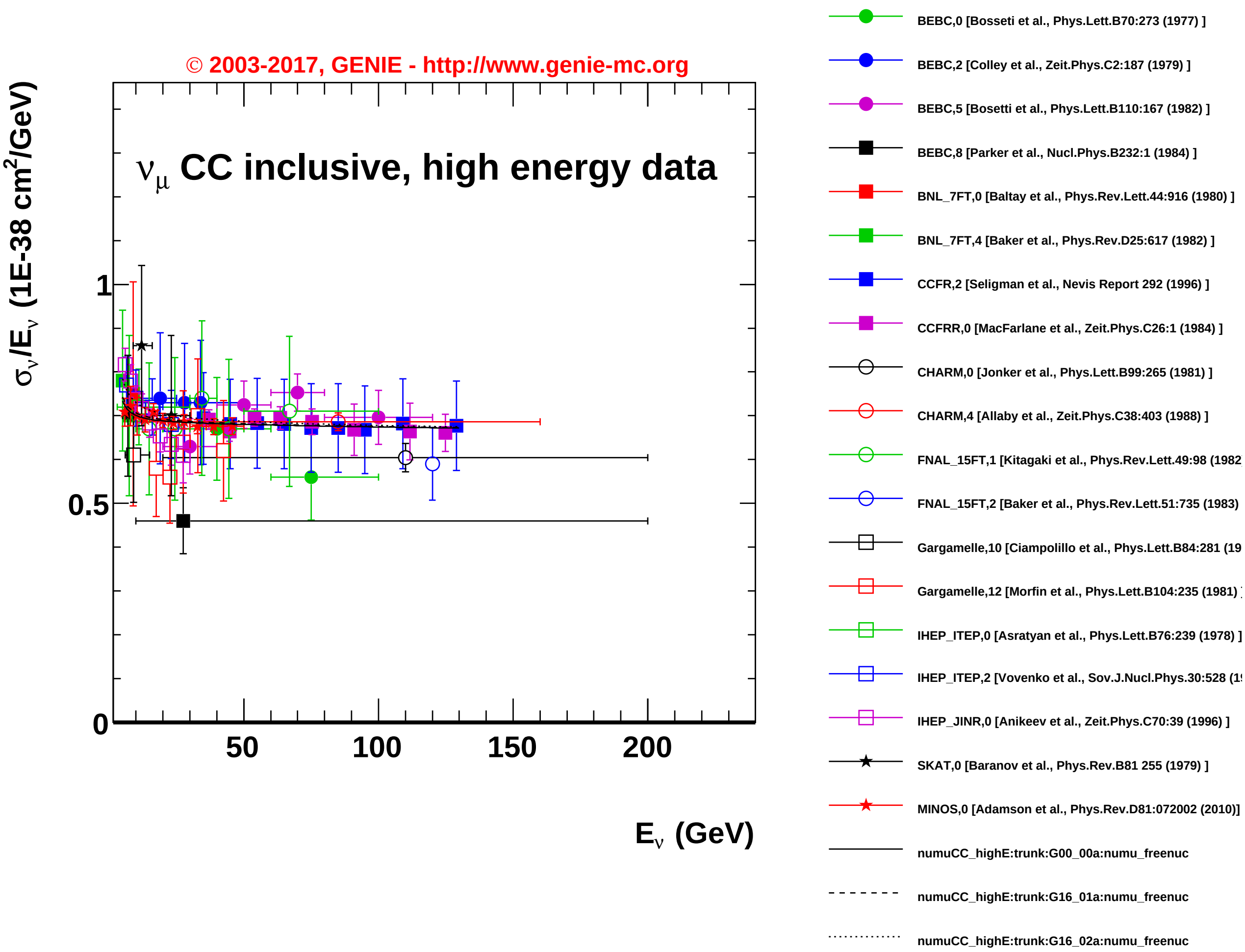

© 2003-2017, GENIE - http://www.genie-mc.org
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IHEP_JINR,0 [Anikeev et al., Zeit.Phys.C70:39 (1996)]
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MINOS,0 [Adamson et al., Phys.Rev.D81:072002 (2010)]
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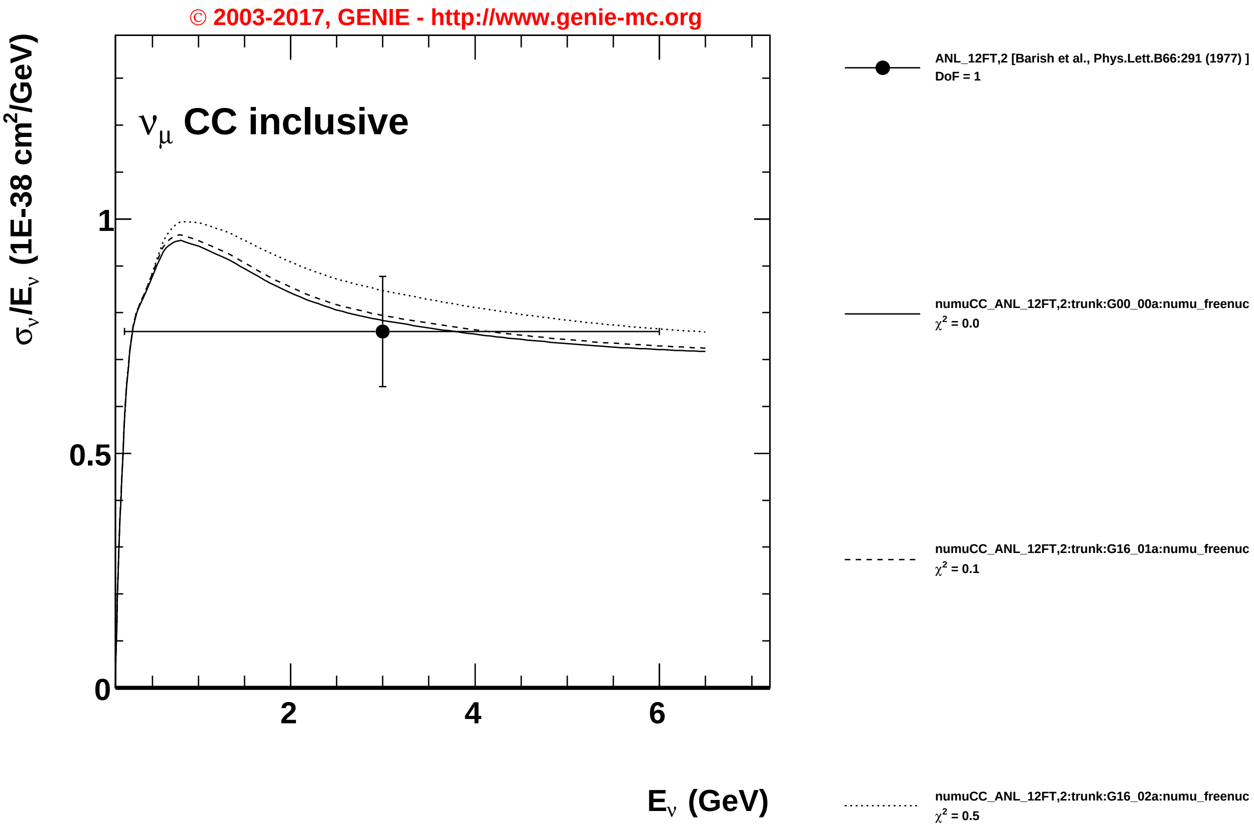

© 2003-2017, GENIE - http://www.genie-mc.org
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E_ν (GeV)
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2
4
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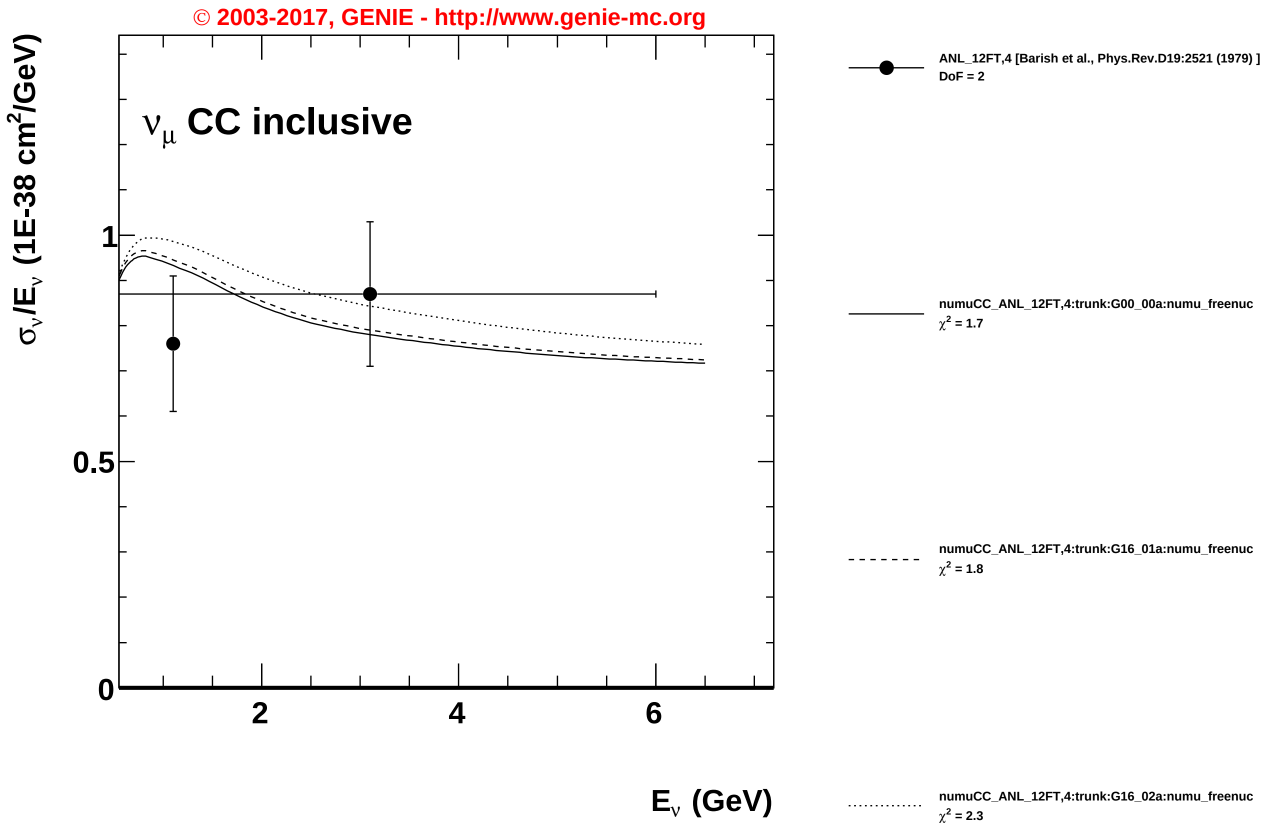

© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
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E_ν (GeV)
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2
4
6
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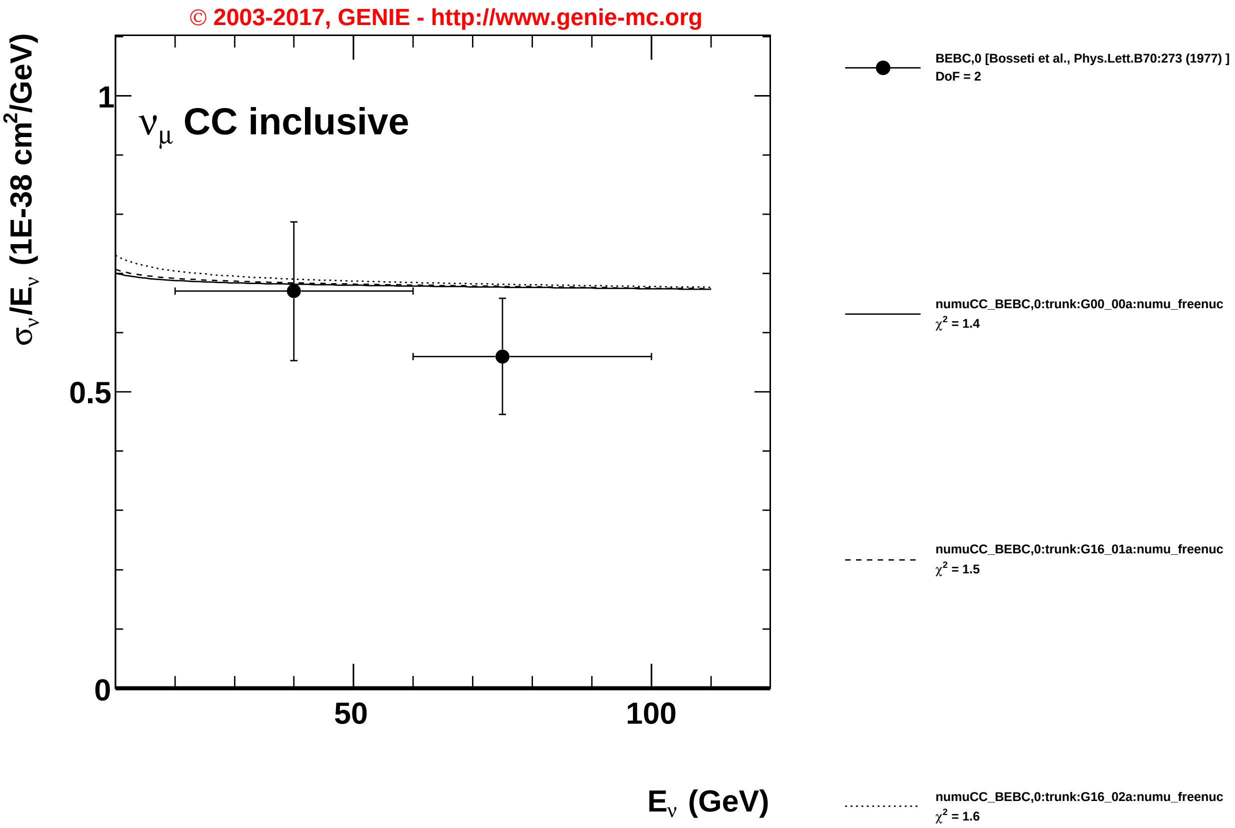

© 2003-2017, GENIE - http://www.genie-mc.org
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0
50
100
E_ν (GeV)
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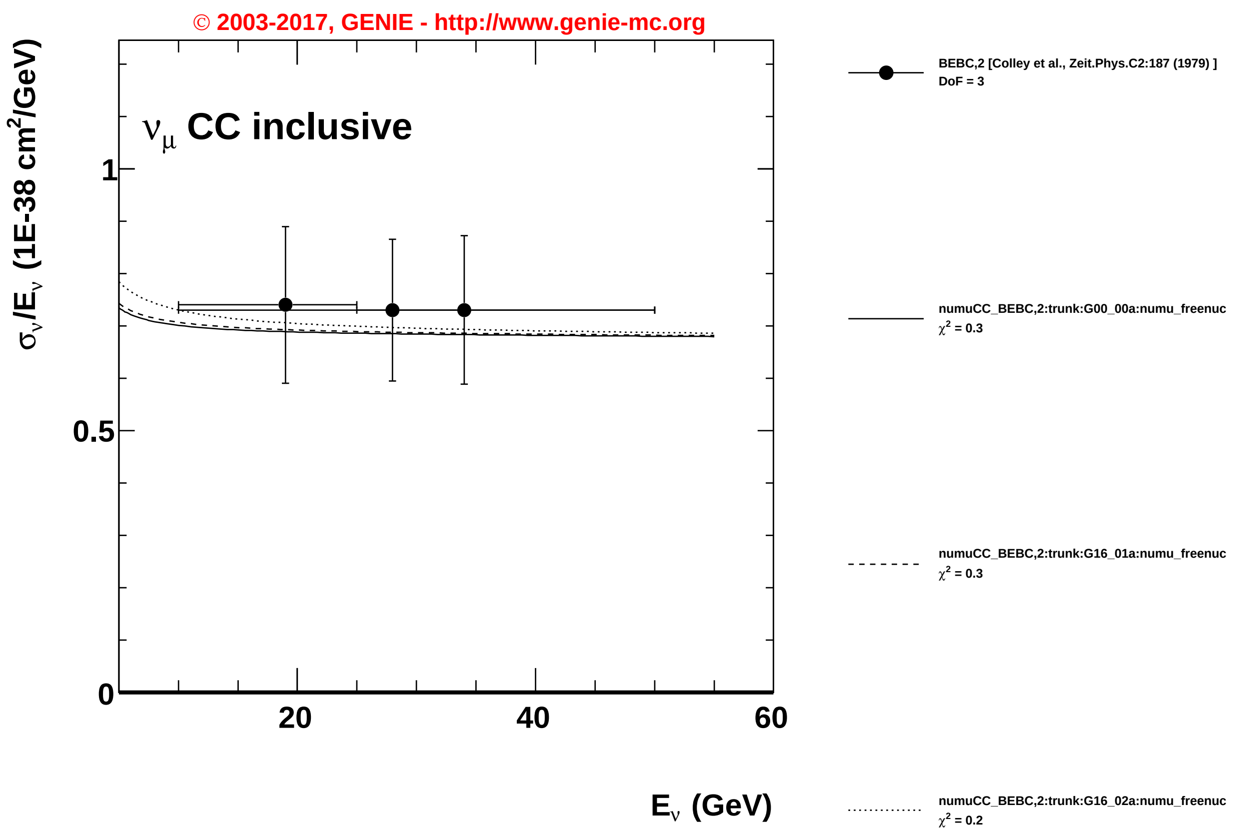
© 2003-2017, GENIE - http://www.genie-mc.org
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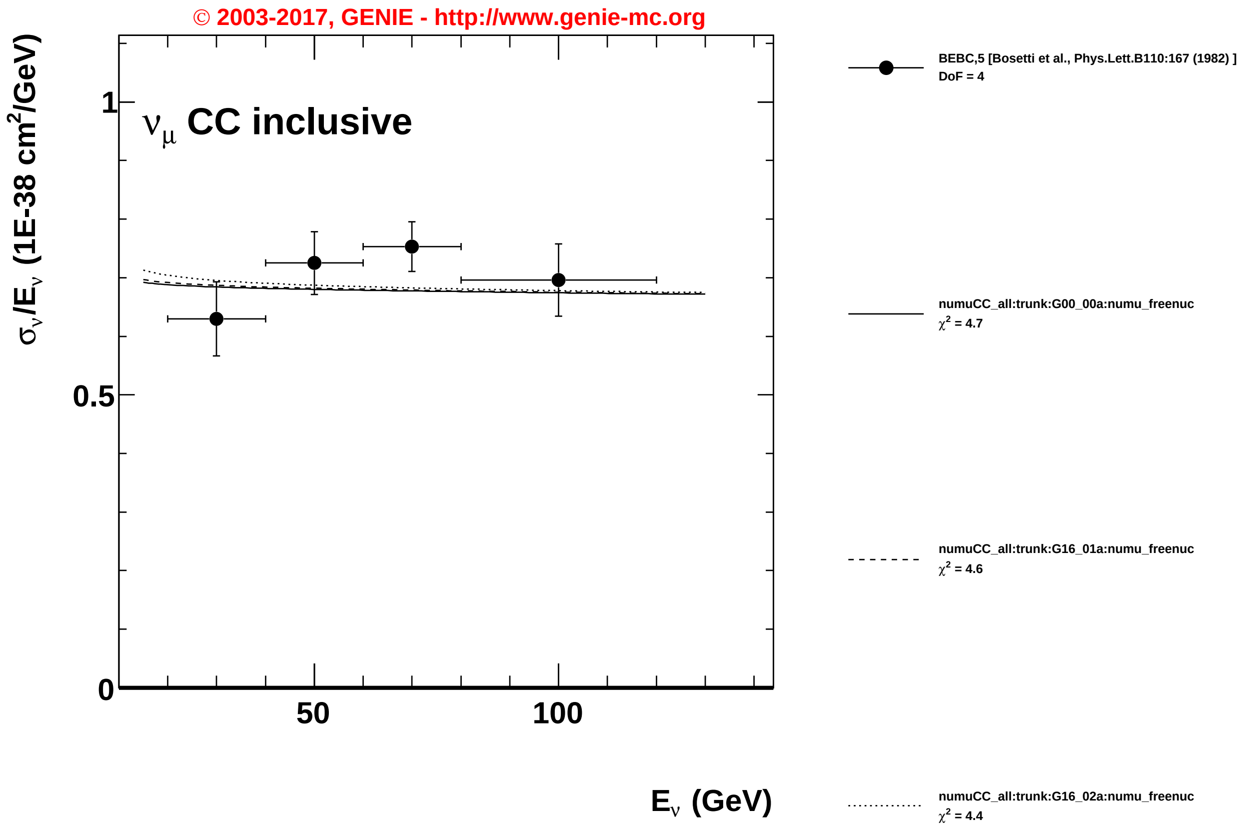
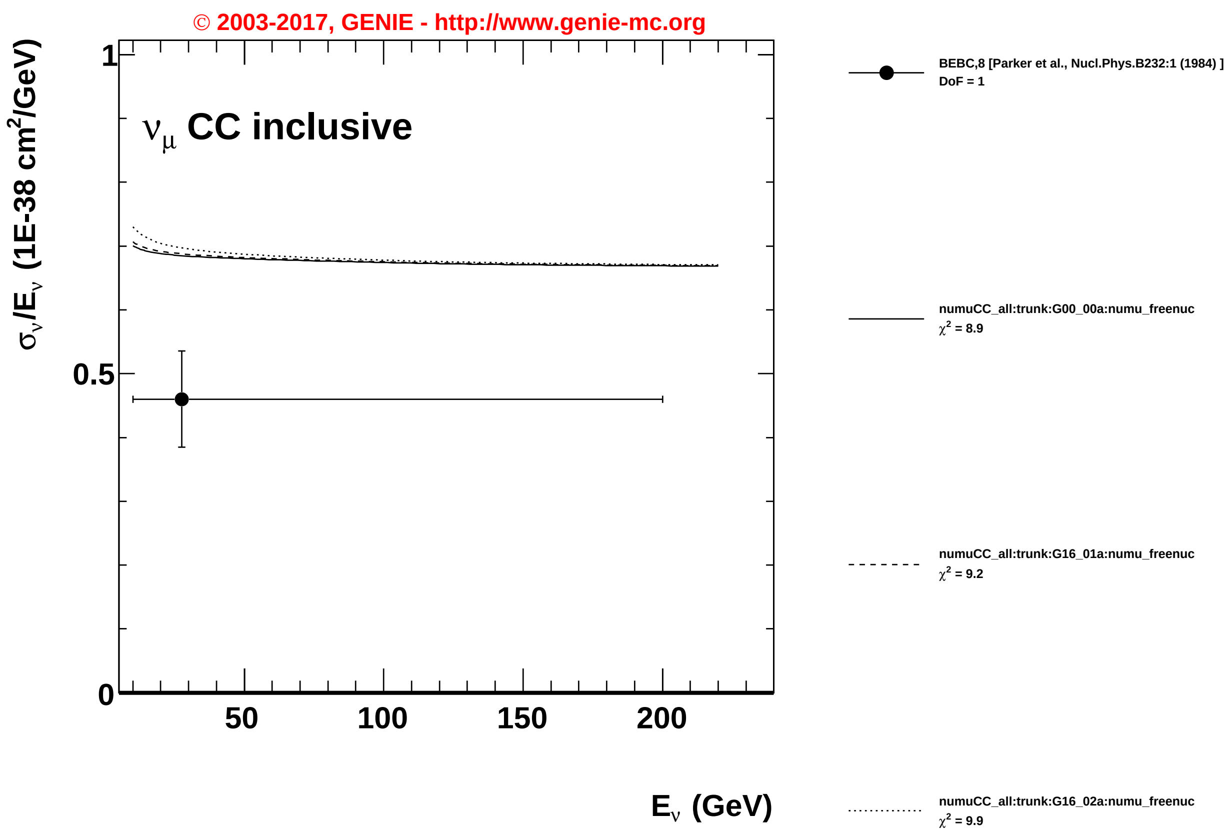
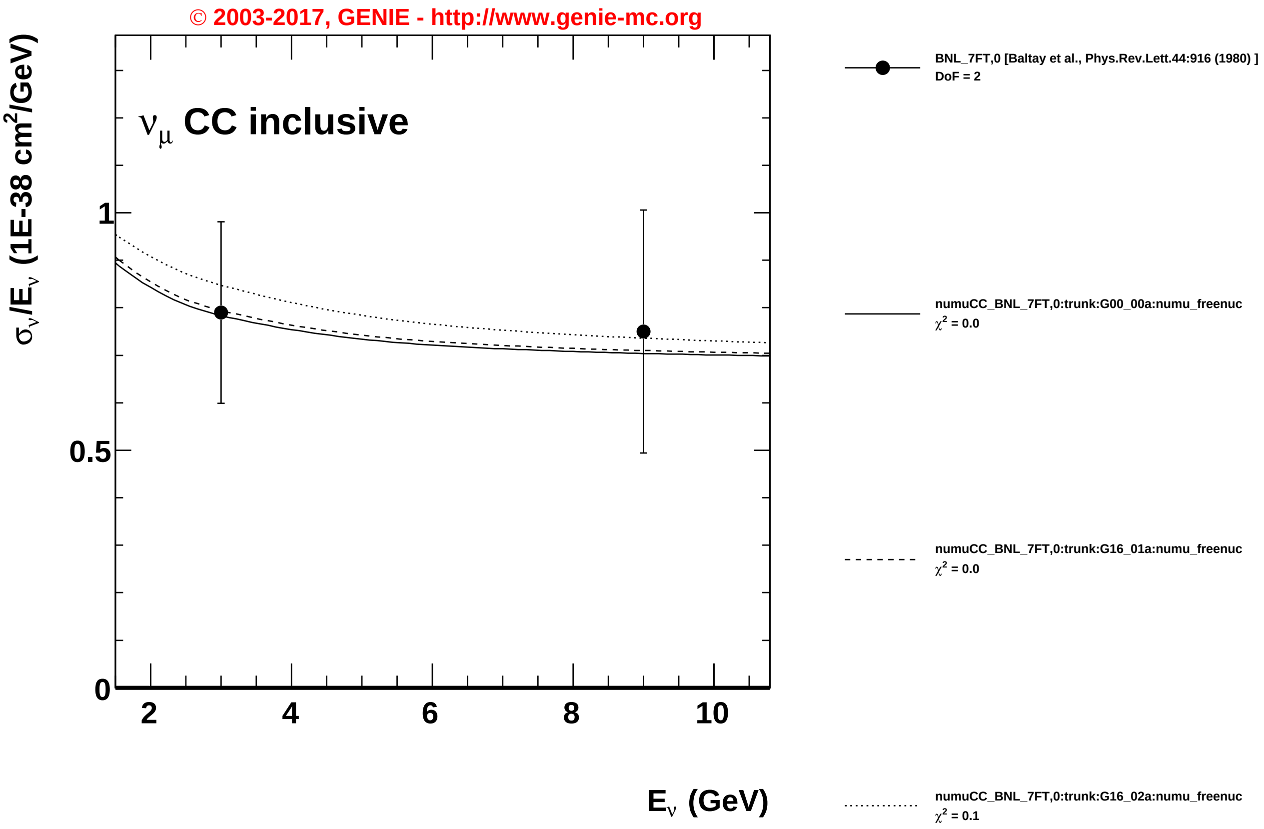
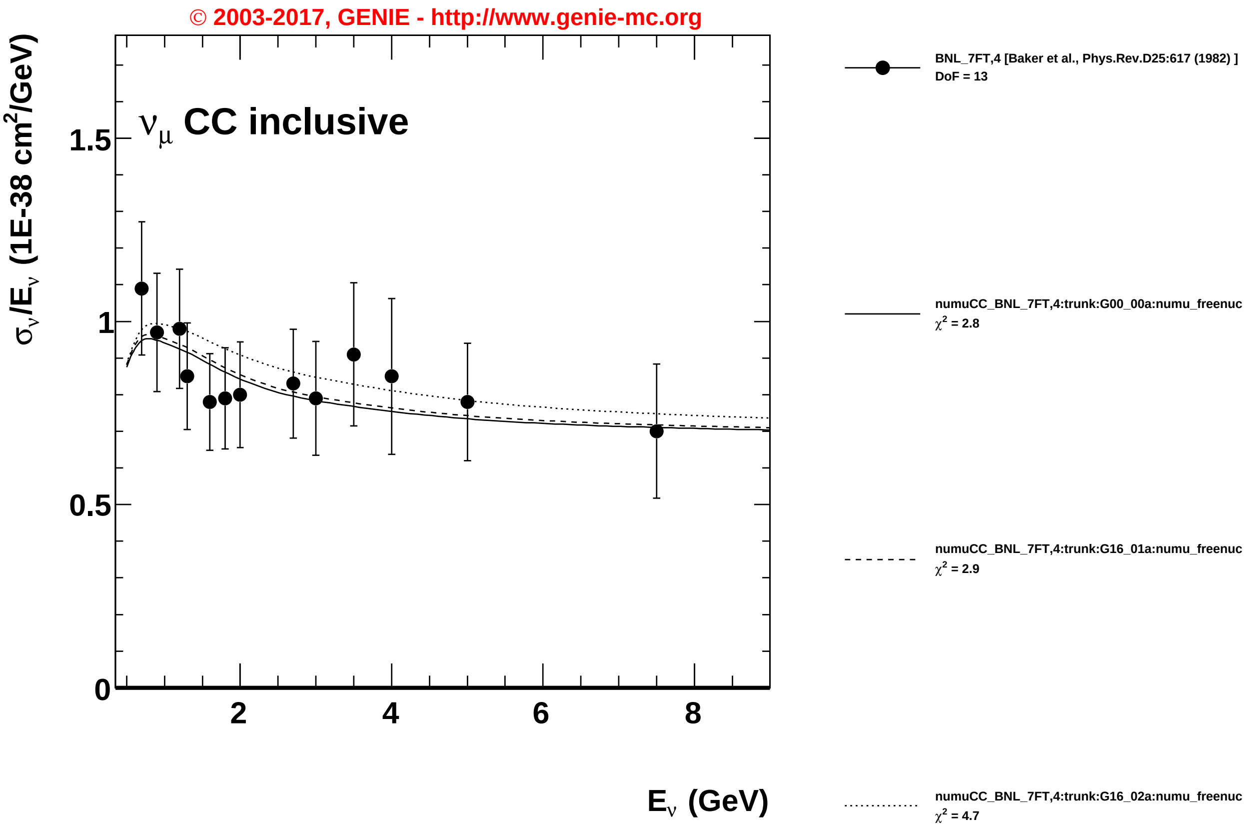
numuCC_BEBC,2:trunk:G16_01a:numu_freenuc
χ^2 = 0.3
numuCC_BEBC,2:trunk:G16_02a:numu_freenuc
χ^2 = 0.2

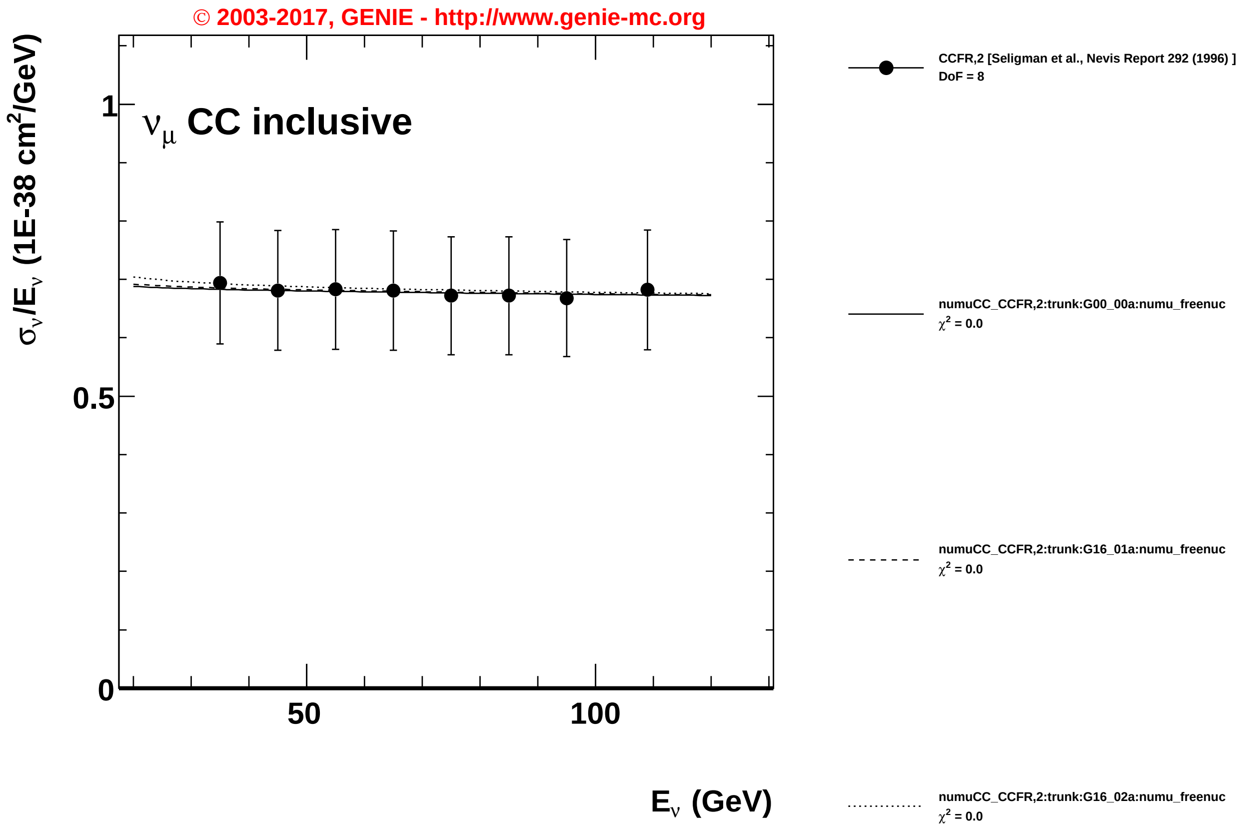

© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.5
1
50
100
BEBC,5 [Bosetti et al., Phys.Lett.B110:167 (1982)]
DoF = 4
numuCC_all:trunk:G00_00a:numu_freenuc
χ^2 = 4.7
numuCC_all:trunk:G16_01a:numu_freenuc
χ^2 = 4.6
numuCC_all:trunk:G16_02a:numu_freenuc
χ^2 = 4.4



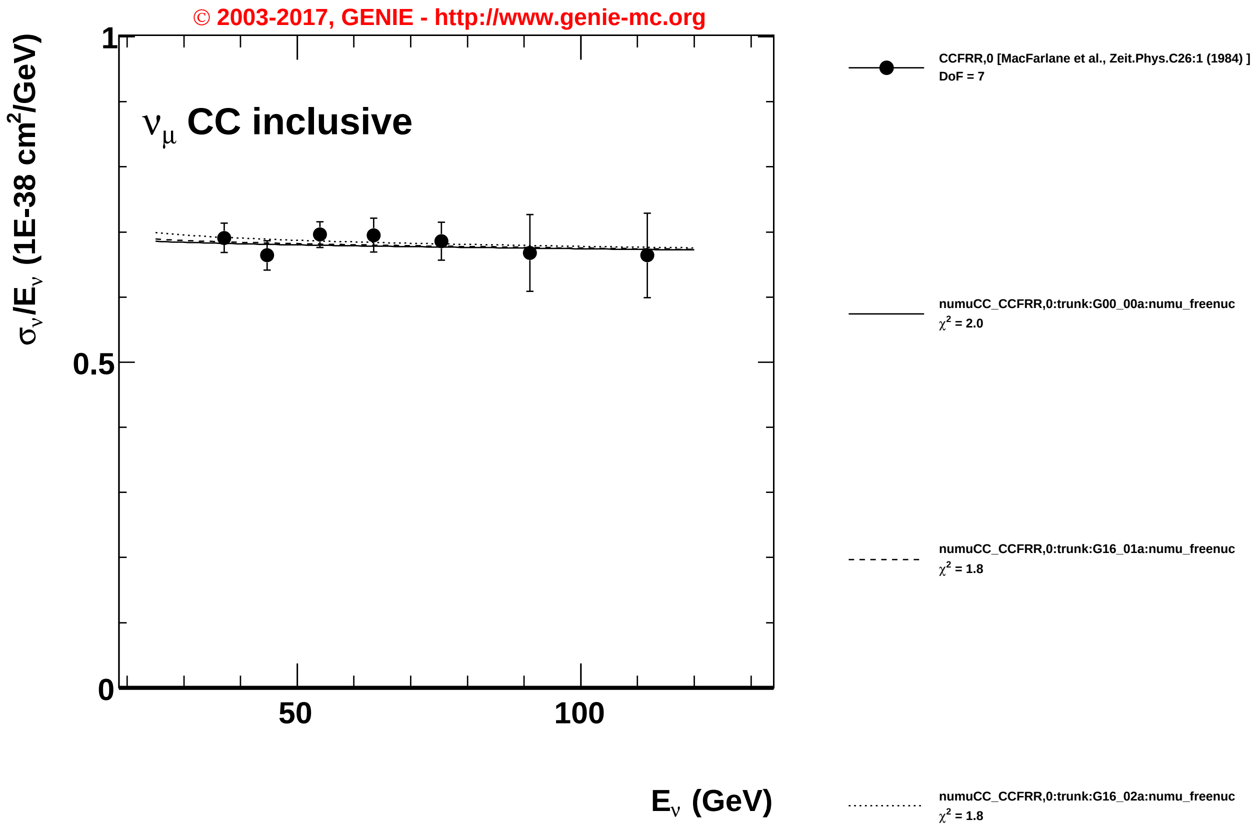
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
1
0.5
0
50
100
150
200
E_ν (GeV)
BEBC,8 [Parker et al., Nucl.Phys.B232:1 (1984)]
DoF = 1
numuCC_all:trunk:G00_00a:numu_freenuc
χ^2 = 8.9
numuCC_all:trunk:G16_01a:numu_freenuc
χ^2 = 9.2
numuCC_all:trunk:G16_02a:numu_freenuc
χ^2 = 9.9


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.5
1
2
4
6
8
10
BNL_7FT,0 [Baltay et al., Phys.Rev.Lett.44:916 (1980)]
DoF = 2
numuCC_BNL_7FT,0:trunk:G00_00a:numu_freenuc
χ^2 = 0.0
numuCC_BNL_7FT,0:trunk:G16_01a:numu_freenuc
χ^2 = 0.0
numuCC_BNL_7FT,0:trunk:G16_02a:numu_freenuc
χ^2 = 0.1

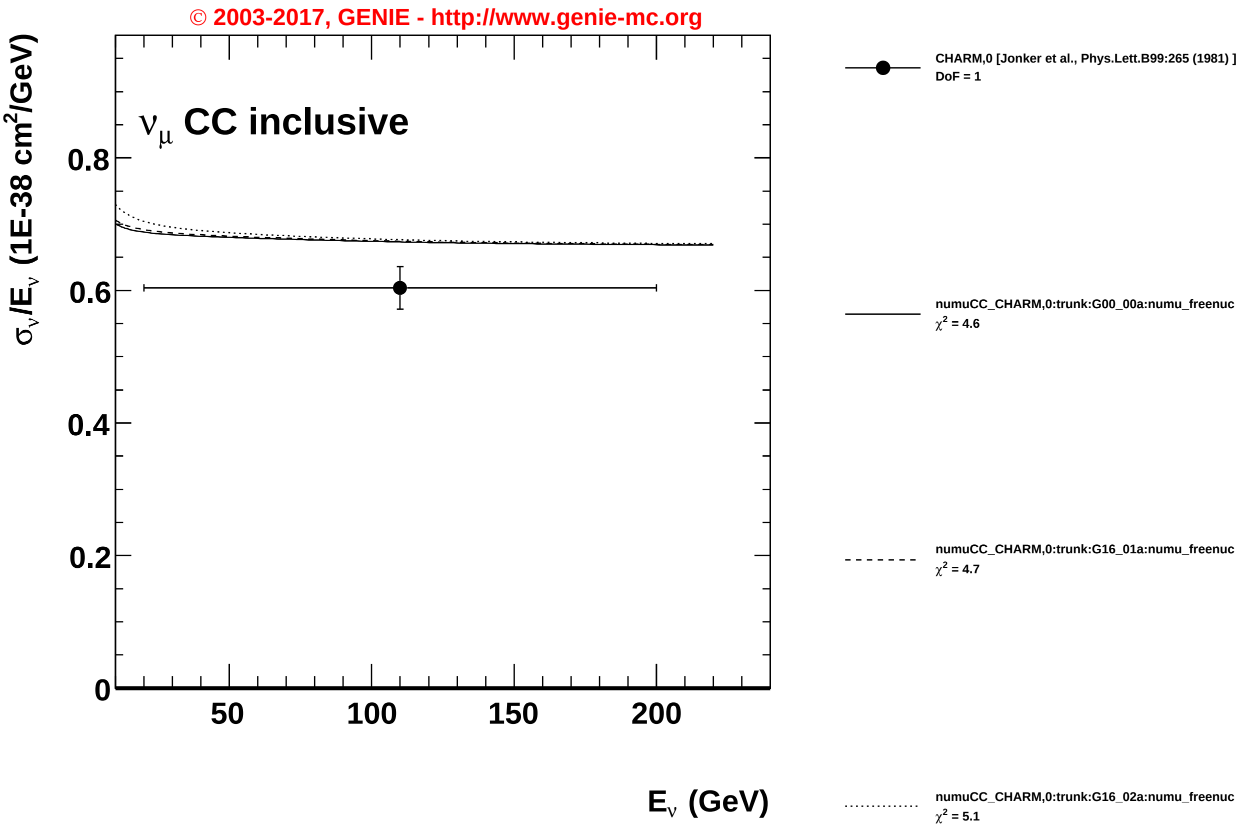

© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
BNL_7FT,4 [Baker et al., Phys.Rev.D25:617 (1982)]
DoF = 13
numuCC_BNL_7FT,4:trunk:G00_00a:numu_freenuc
χ^2 = 2.8
numuCC_BNL_7FT,4:trunk:G16_01a:numu_freenuc
χ^2 = 2.9
numuCC_BNL_7FT,4:trunk:G16_02a:numu_freenuc
χ^2 = 4.7



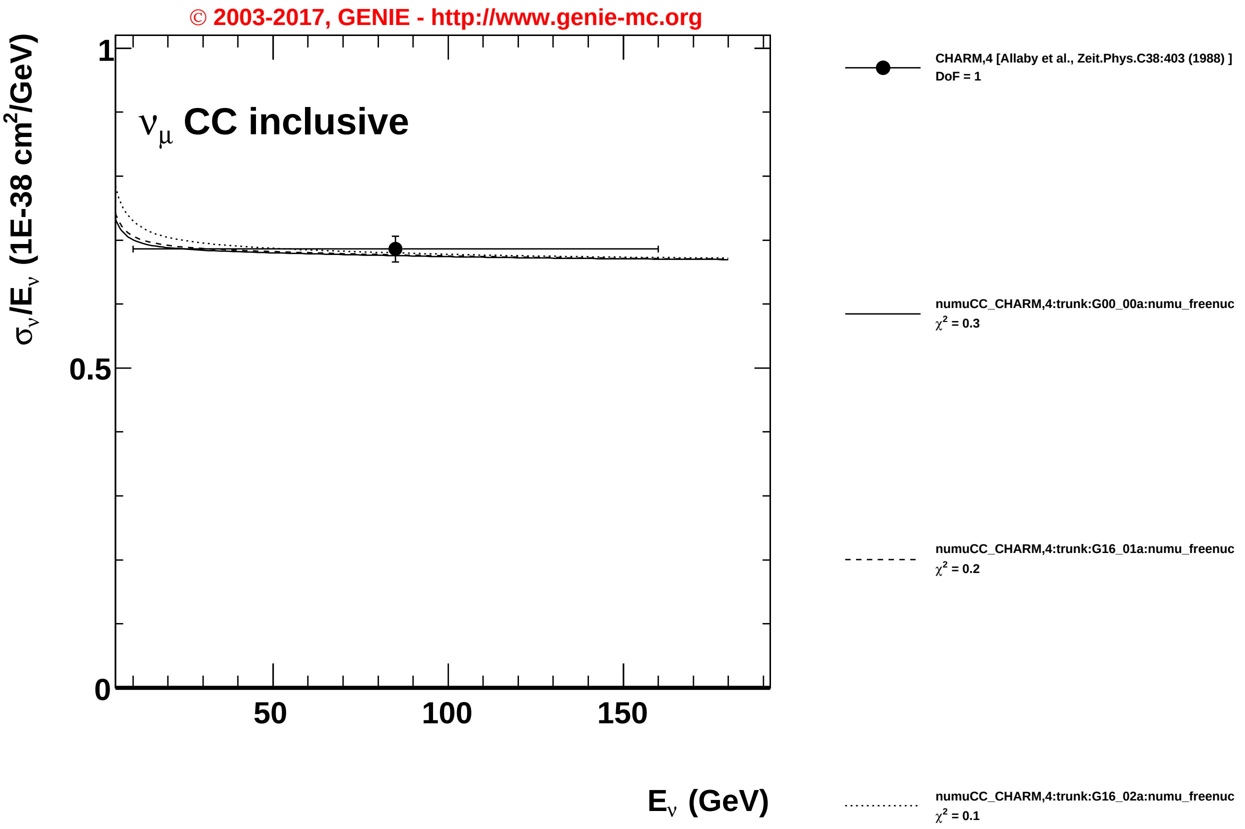
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.5
1
50
100
CCFR,2 [Seligman et al., Nevis Report 292 (1996)]
DoF = 8
numuCC_CCFR,2:trunk:G00_00a:numu_freenuc
χ^2 = 0.0
numuCC_CCFR,2:trunk:G16_01a:numu_freenuc
χ^2 = 0.0
numuCC_CCFR,2:trunk:G16_02a:numu_freenuc
χ^2 = 0.0



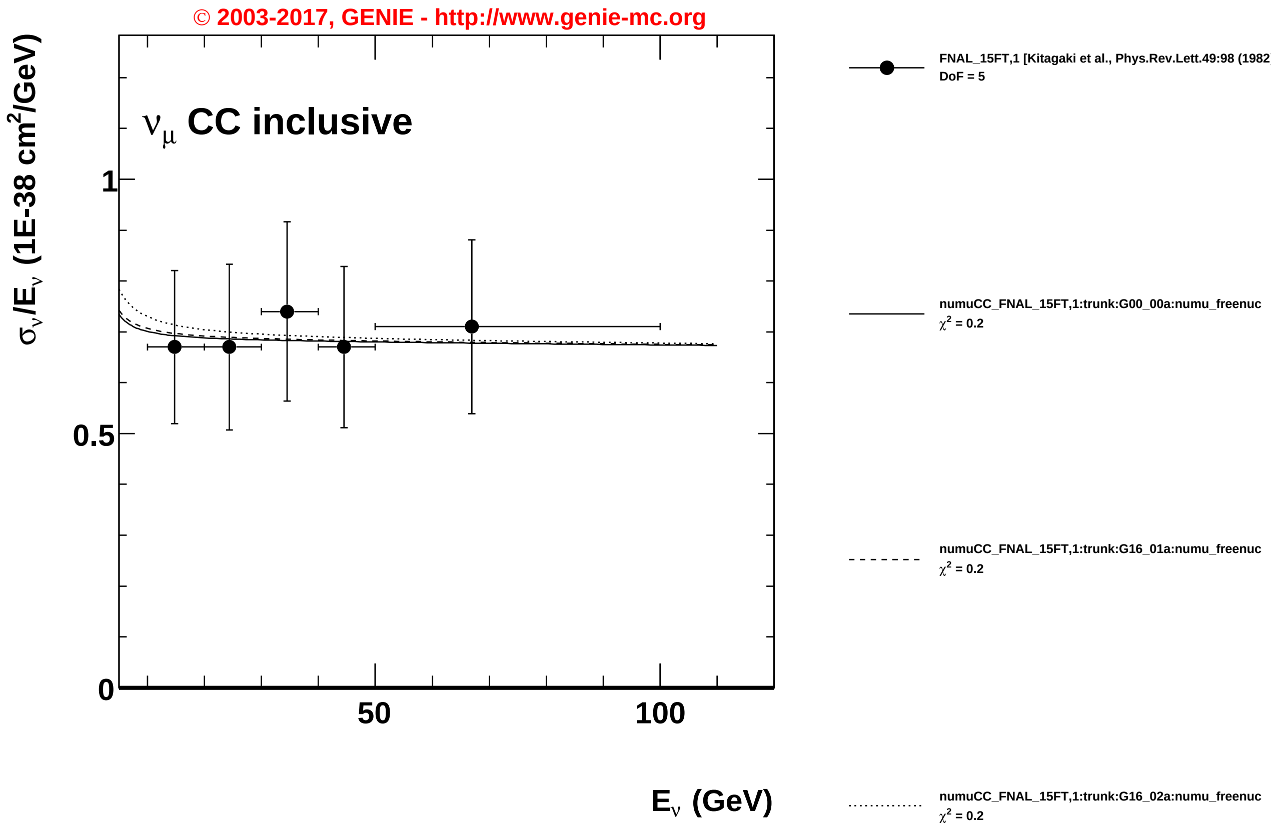
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.5
1
50
100
CCFRR,0 [MacFarlane et al., Zeit.Phys.C26:1 (1984)]
DoF = 7
numuCC_CCFRR,0:trunk:G00_00a:numu_freenuc
χ^2 = 2.0
numuCC_CCFRR,0:trunk:G16_01a:numu_freenuc
χ^2 = 1.8
numuCC_CCFRR,0:trunk:G16_02a:numu_freenuc
χ^2 = 1.8

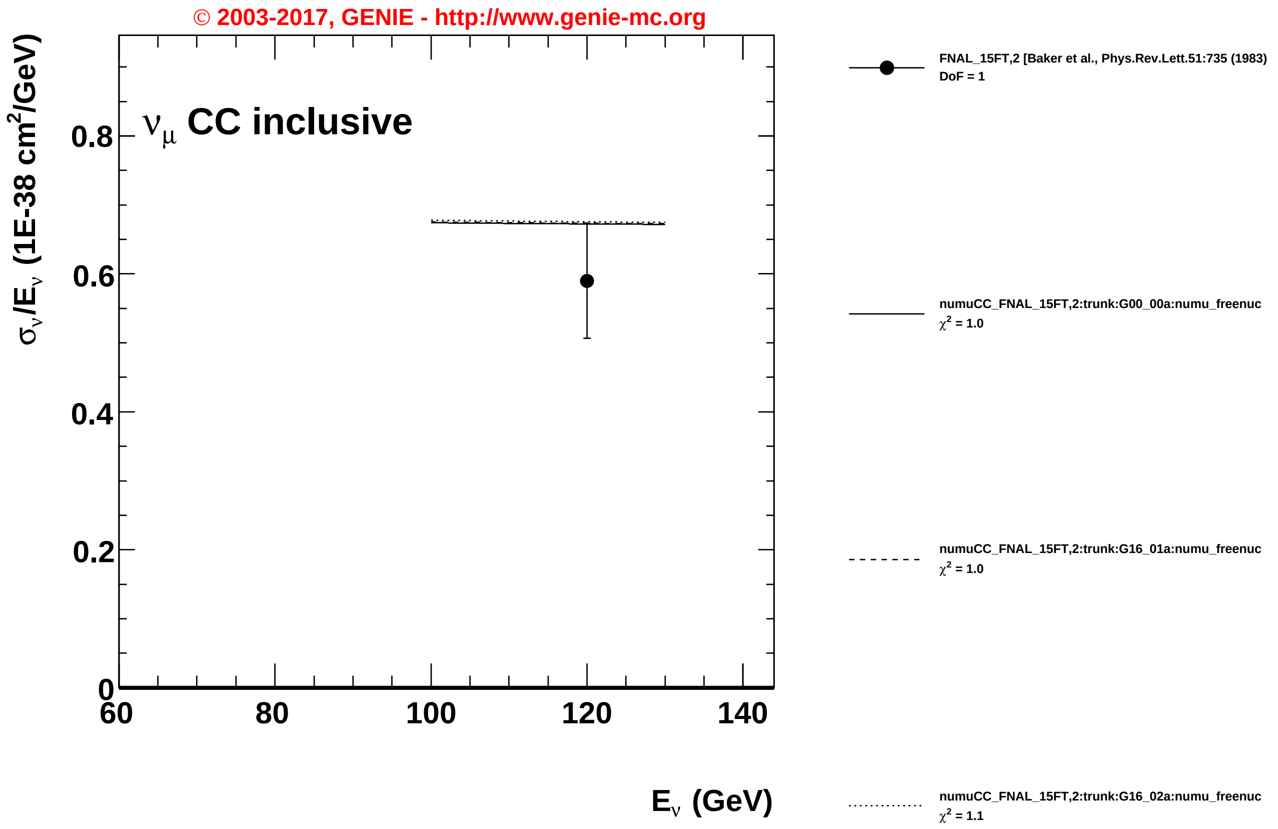


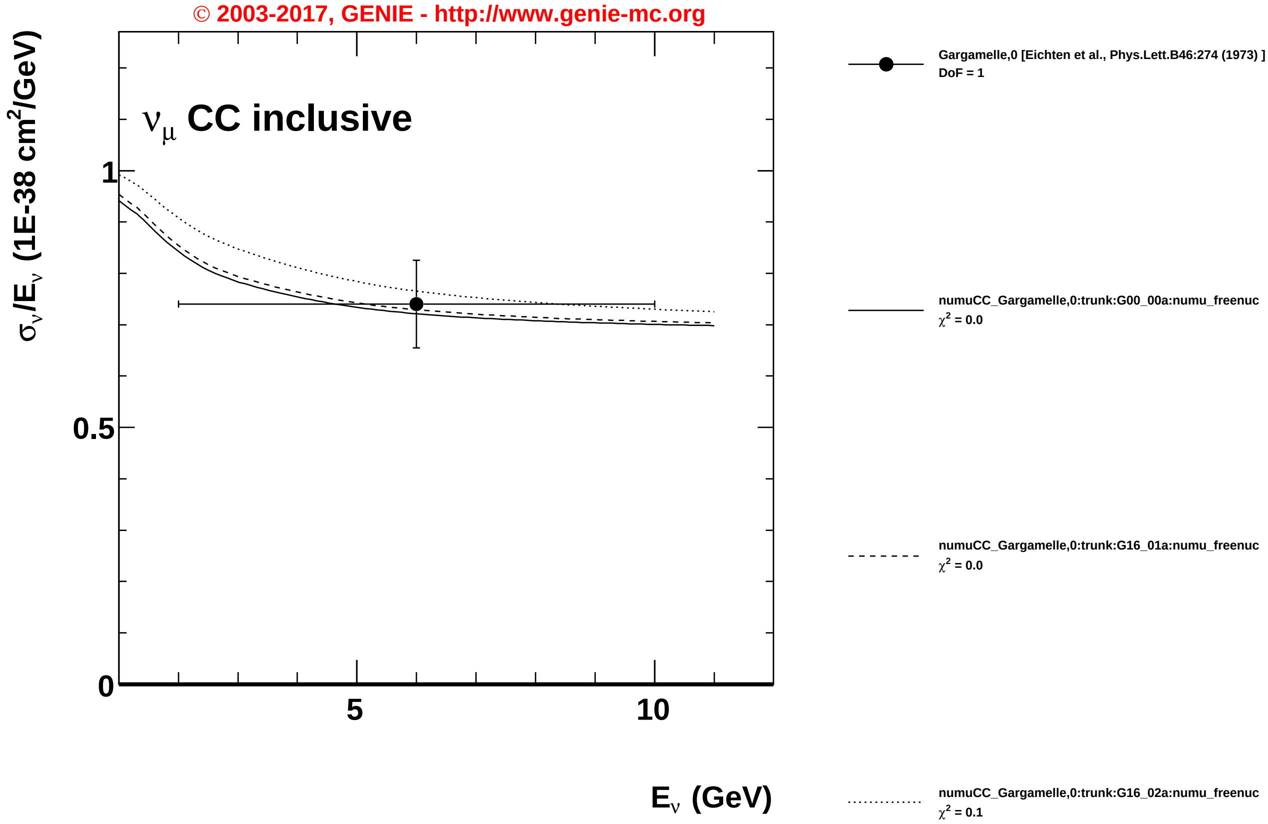
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.2
0.4
0.6
0.8
50
100
150
200
E_ν (GeV)
CHARM,0 [Jonker et al., Phys.Lett.B99:265 (1981)]
DoF = 1
numuCC_CHARM,0:trunk:G00_00a:numu_freenuc
χ^2 = 4.6
numuCC_CHARM,0:trunk:G16_01a:numu_freenuc
χ^2 = 4.7
numuCC_CHARM,0:trunk:G16_02a:numu_freenuc
χ^2 = 5.1



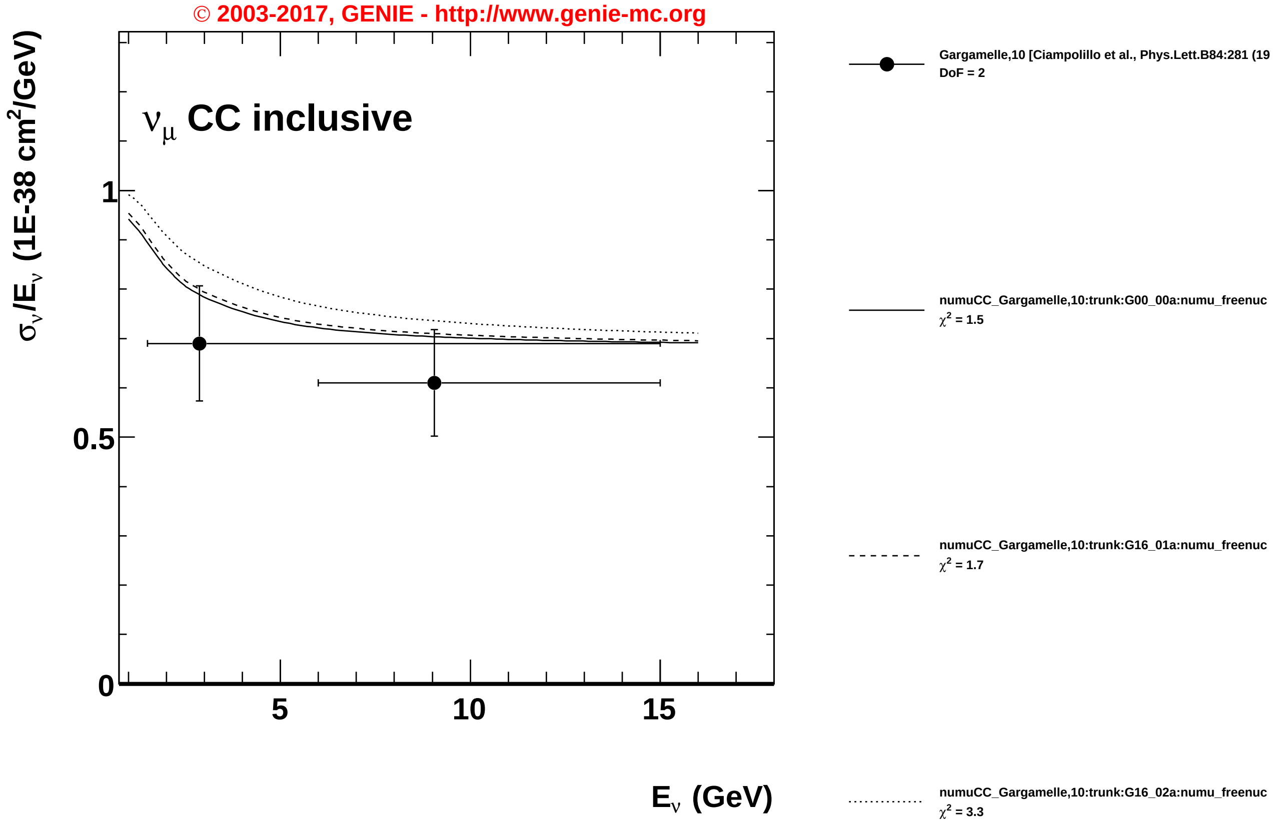
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
1
0.5
0
50
100
150
CHARM,4 [Allaby et al., Zeit.Phys.C38:403 (1988)]
DoF = 1
numuCC_CHARM,4:trunk:G00_00a:numu_freenuc
χ^2 = 0.3
numuCC_CHARM,4:trunk:G16_01a:numu_freenuc
χ^2 = 0.2
numuCC_CHARM,4:trunk:G16_02a:numu_freenuc
χ^2 = 0.1


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.5
1
50
100
E_ν (GeV)
FNAL_15FT,1 [Kitagaki et al., Phys.Rev.Lett.49:98 (1982
DoF = 5
numuCC_FNAL_15FT,1:trunk:G00_00a:numu_freenuc
χ^2 = 0.2
numuCC_FNAL_15FT,1:trunk:G16_01a:numu_freenuc
χ^2 = 0.2
numuCC_FNAL_15FT,1:trunk:G16_02a:numu_freenuc
χ^2 = 0.2

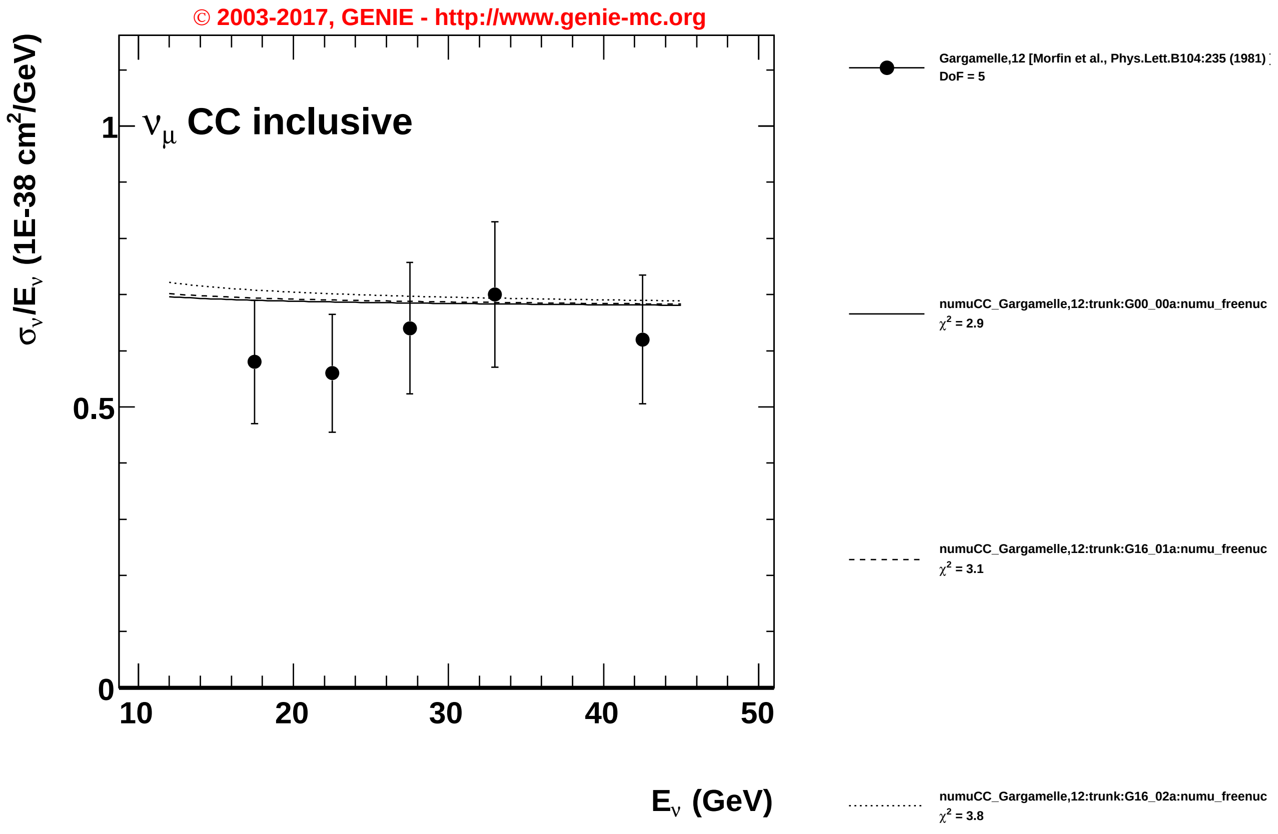

© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.2
0.4
0.6
0.8
60
80
100
120
140
E_ν (GeV)
FNAL_15FT,2 [Baker et al., Phys.Rev.Lett.51:735 (1983)
DoF = 1
numuCC_FNAL_15FT,2:trunk:G00_00a:numu_freenuc
χ^2 = 1.0
numuCC_FNAL_15FT,2:trunk:G16_01a:numu_freenuc
χ^2 = 1.0
numuCC_FNAL_15FT,2:trunk:G16_02a:numu_freenuc
χ^2 = 1.1

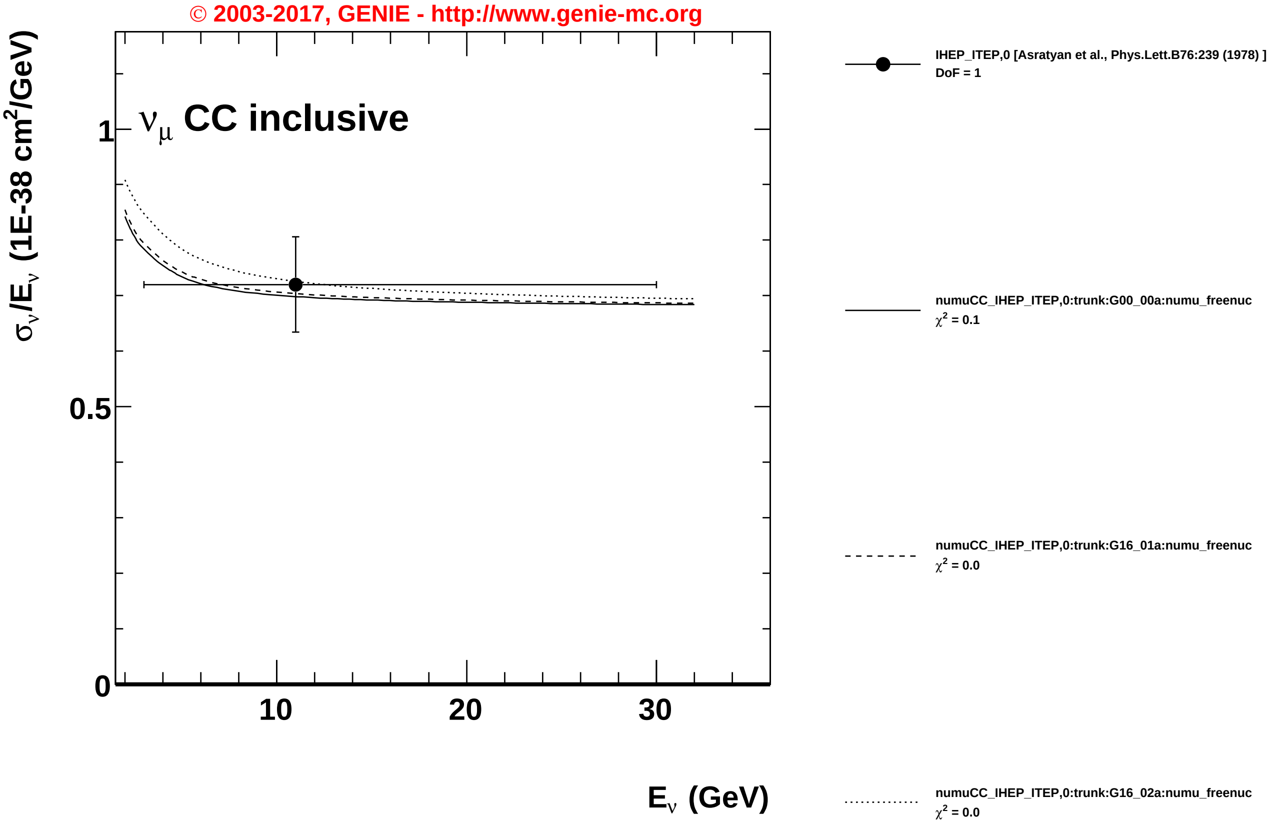


ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.5
1
5
10
Gargamelle,0 [Eichten et al., Phys.Lett.B46:274 (1973)]
DoF = 1
numuCC_Gargamelle,0:trunk:G00_00a:numu_freenuc
χ^2 = 0.0
numuCC_Gargamelle,0:trunk:G16_01a:numu_freenuc
χ^2 = 0.0
numuCC_Gargamelle,0:trunk:G16_02a:numu_freenuc
χ^2 = 0.1

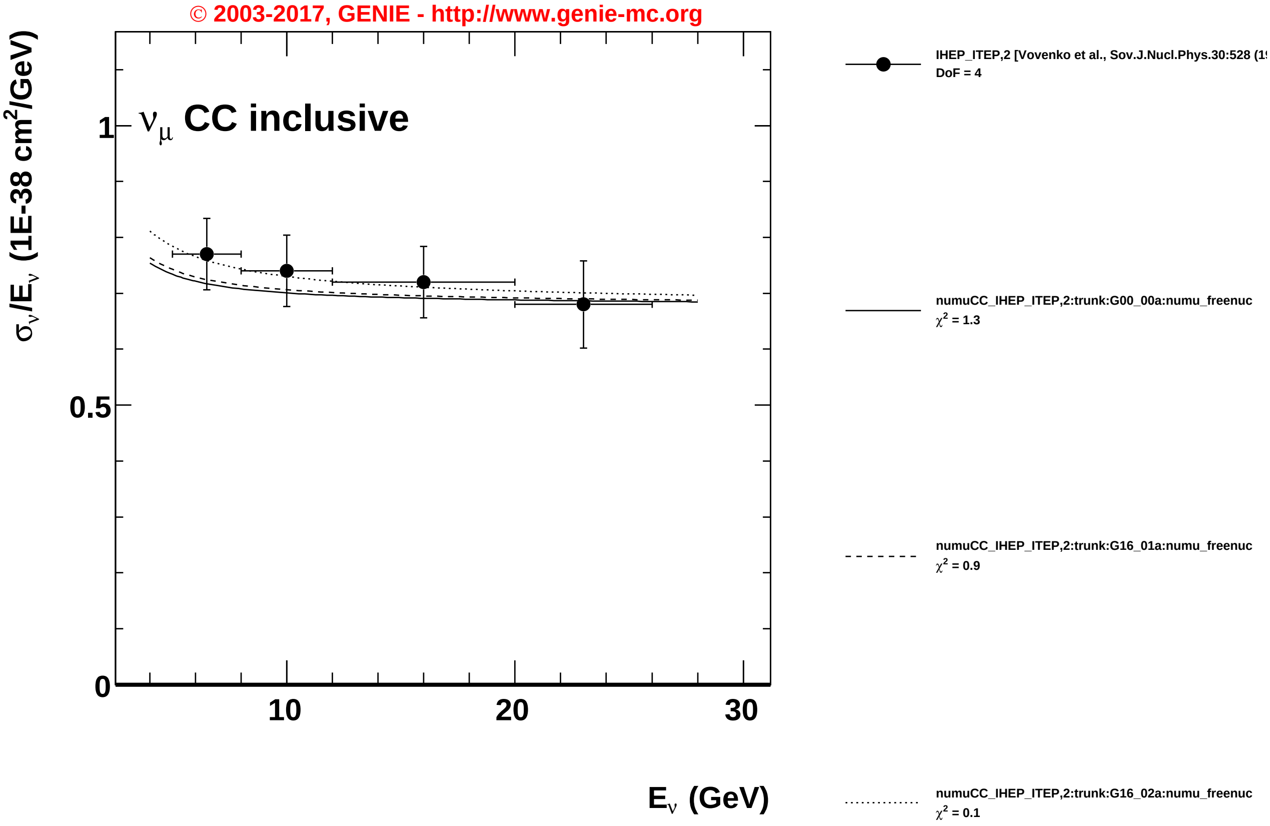


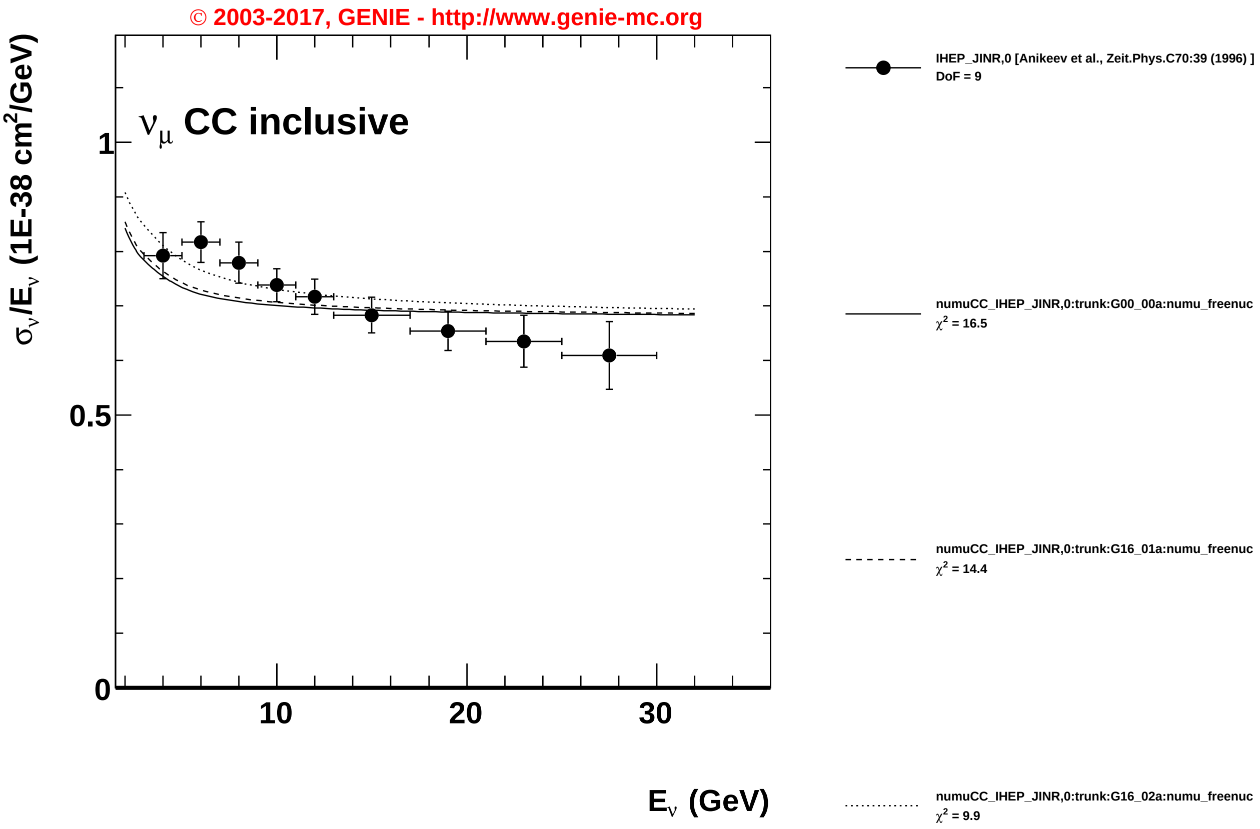
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
1
0.5
0
5
10
15
E_ν (GeV)
Gargamelle,10 [Ciampolillo et al., Phys.Lett.B84:281 (19
DoF = 2
numuCC_Gargamelle,10:trunk:G00_00a:numu_freenuc
χ^2 = 1.5
numuCC_Gargamelle,10:trunk:G16_01a:numu_freenuc
χ^2 = 1.7
numuCC_Gargamelle,10:trunk:G16_02a:numu_freenuc
χ^2 = 3.3

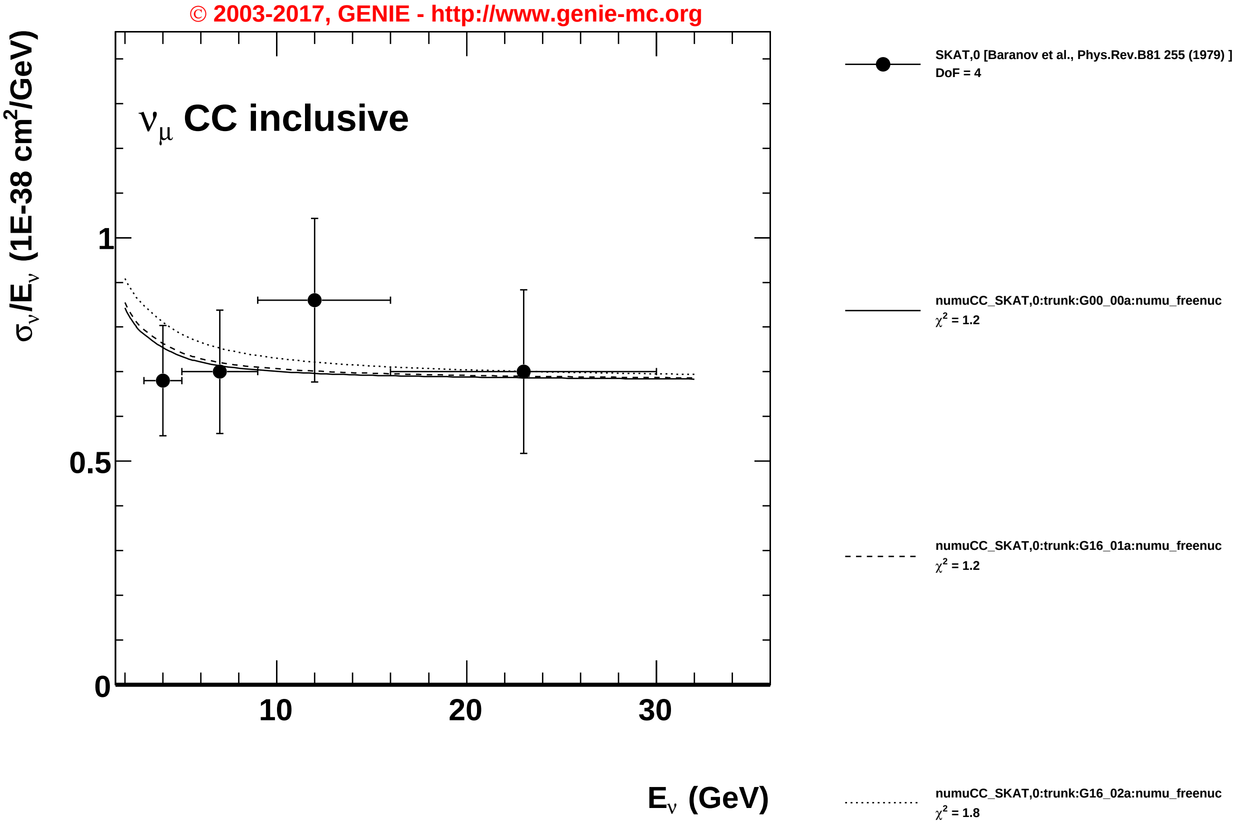

© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.5
1
10
20
30
40
50
Gargamelle,12 [Morfin et al., Phys.Lett.B104:235 (1981)]
DoF = 5
numuCC_Gargamelle,12:trunk:G00_00a:numu_freenuc
χ^2 = 2.9
numuCC_Gargamelle,12:trunk:G16_01a:numu_freenuc
χ^2 = 3.1
numuCC_Gargamelle,12:trunk:G16_02a:numu_freenuc
χ^2 = 3.8

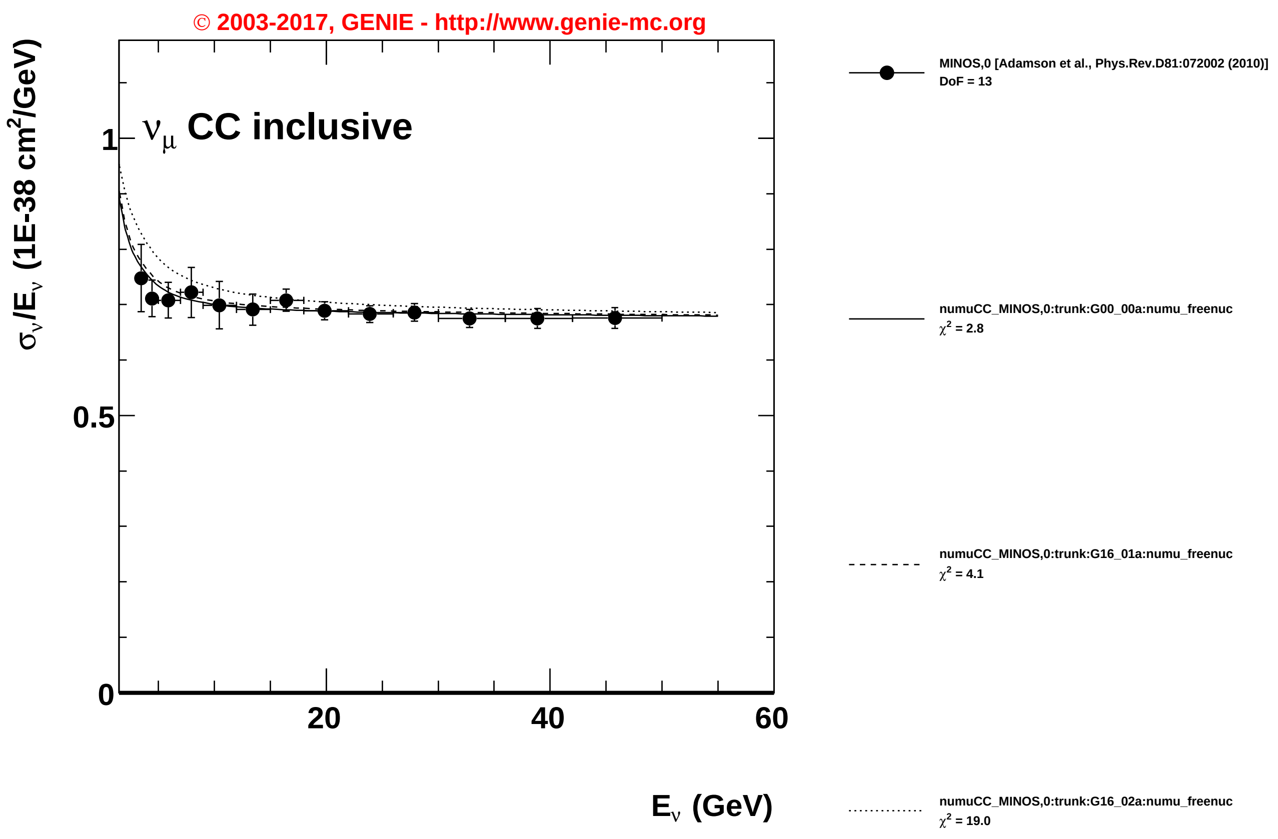


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.5
1
10
20
30
IHEP_ITEP,0 [Asratyan et al., Phys.Lett.B76:239 (1978)]
DoF = 1
numuCC_IHEP_ITEP,0:trunk:G00_00a:numu_freenuc
χ^2 = 0.1
numuCC_IHEP_ITEP,0:trunk:G16_01a:numu_freenuc
χ^2 = 0.0
numuCC_IHEP_ITEP,0:trunk:G16_02a:numu_freenuc
χ^2 = 0.0

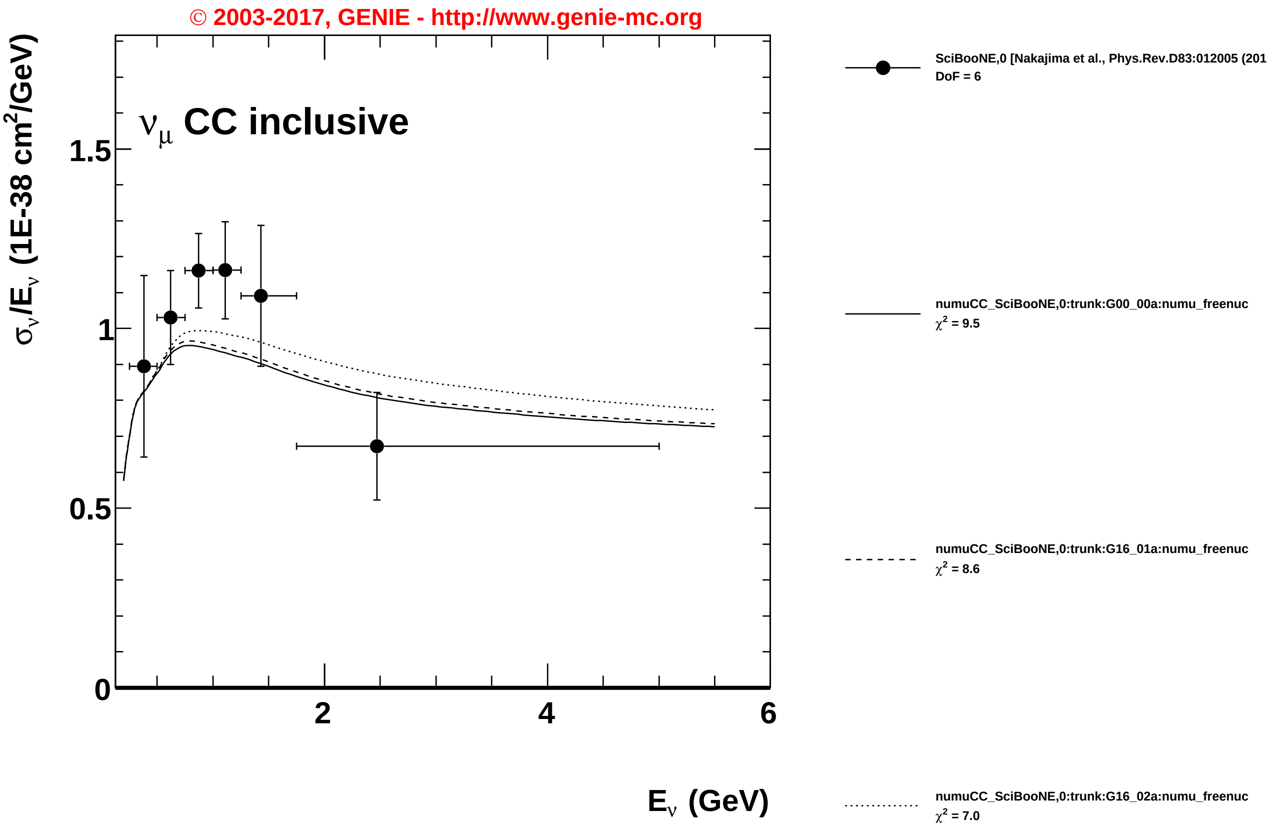

© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
1
0.5
0
10
20
30
E_ν (GeV)
IHEP_ITEP,2 [Vovenko et al., Sov.J.Nucl.Phys.30:528 (1
DoF = 4
numuCC_IHEP_ITEP,2:trunk:G00_00a:numu_freenuc
χ^2 = 1.3
numuCC_IHEP_ITEP,2:trunk:G16_01a:numu_freenuc
χ^2 = 0.9
numuCC_IHEP_ITEP,2:trunk:G16_02a:numu_freenuc
χ^2 = 0.1


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.5
1
10
20
30
IHEP_JINR,0 [Anikeev et al., Zeit.Phys.C70:39 (1996)]
DoF = 9
numuCC_IHEP_JINR,0:trunk:G00_00a:numu_freenuc
χ^2 = 16.5
numuCC_IHEP_JINR,0:trunk:G16_01a:numu_freenuc
χ^2 = 14.4
numuCC_IHEP_JINR,0:trunk:G16_02a:numu_freenuc
χ^2 = 9.9


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.5
1
10
20
30
E_ν (GeV)
SKAT,0 [Baranov et al., Phys.Rev.B81 255 (1979)]
DoF = 4
numuCC_SKAT,0:trunk:G00_00a:numu_freenuc
χ^2 = 1.2
numuCC_SKAT,0:trunk:G16_01a:numu_freenuc
χ^2 = 1.2
numuCC_SKAT,0:trunk:G16_02a:numu_freenuc
χ^2 = 1.8



© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
1
0.5
0
20
40
60
E_ν (GeV)
MINOS,0 [Adamson et al., Phys.Rev.D81:072002 (2010)]
DoF = 13
numuCC_MINOS,0:trunk:G00_00a:numu_freenuc
χ^2 = 2.8
numuCC_MINOS,0:trunk:G16_01a:numu_freenuc
χ^2 = 4.1
numuCC_MINOS,0:trunk:G16_02a:numu_freenuc
χ^2 = 19.0



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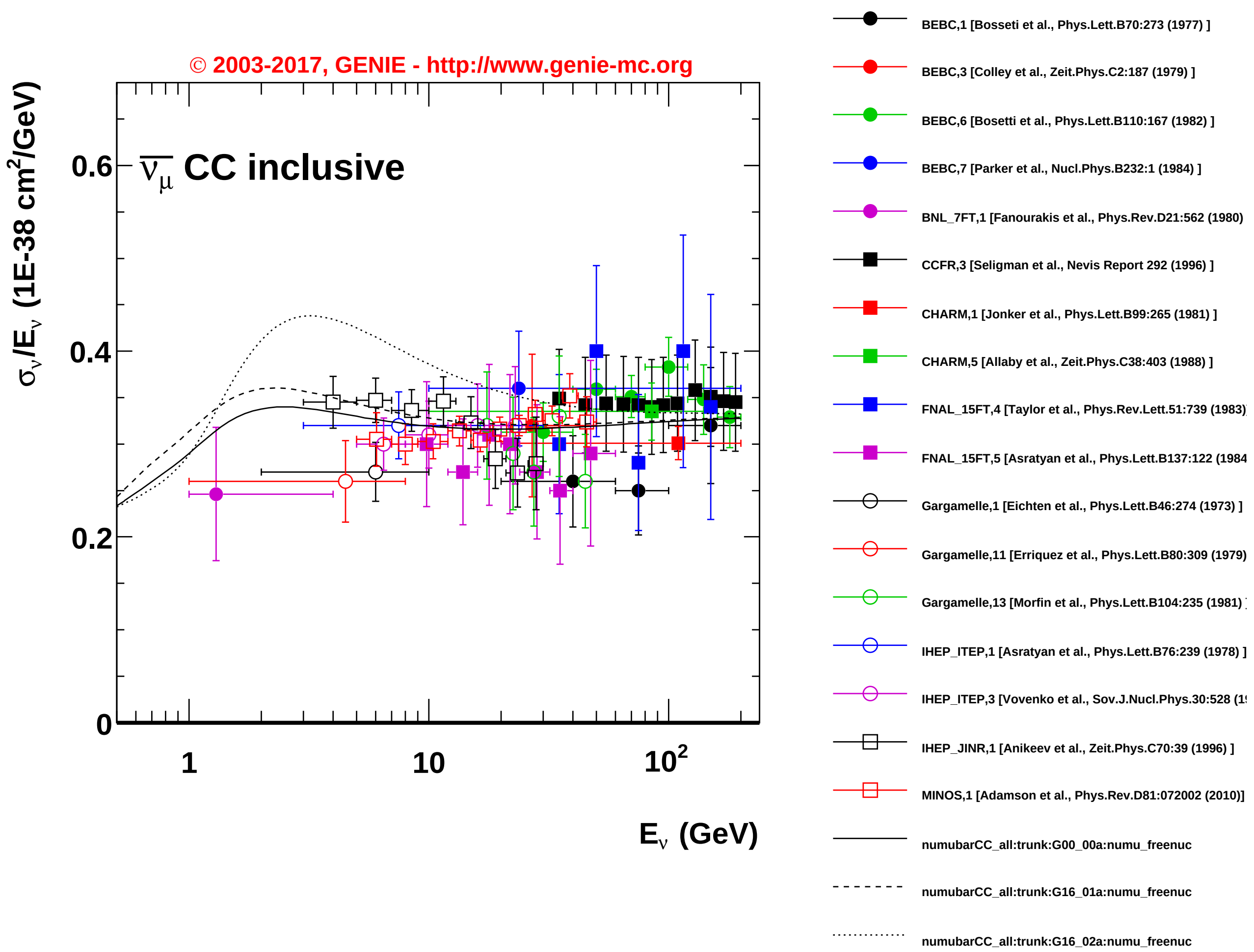
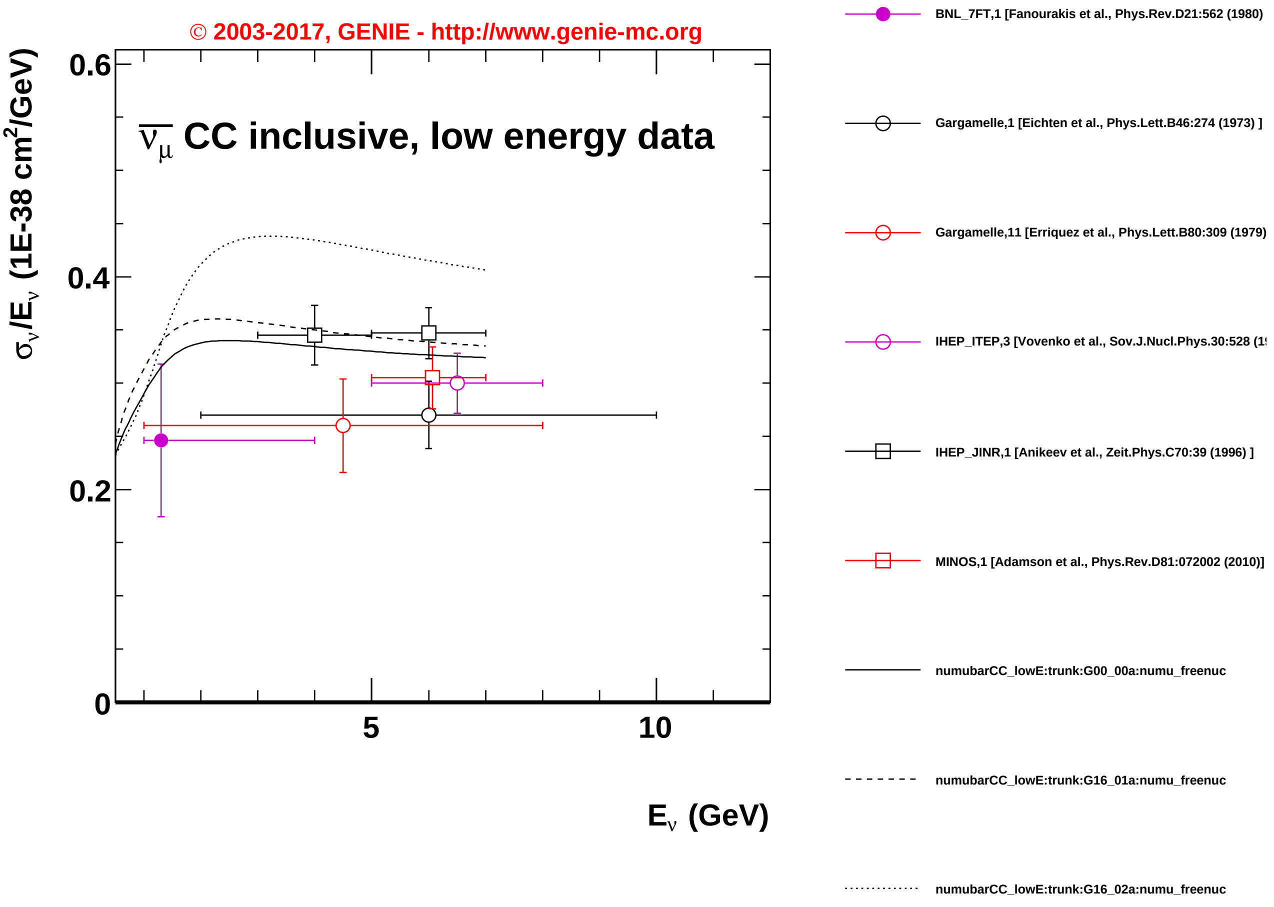
ν_μ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
SciBooNE,0 [Nakajima et al., Phys.Rev.D83:012005 (201
DoF = 6
numuCC_SciBooNE,0:trunk:G00_00a:numu_freenuc
χ^2 = 9.5
numuCC_SciBooNE,0:trunk:G16_01a:numu_freenuc
χ^2 = 8.6
numuCC_SciBooNE,0:trunk:G16_02a:numu_freenuc
χ^2 = 7.0



© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.2
0.4
0.6
1
10
10^2
BEBC,1 [Bosseti et al., Phys.Lett.B70:273 (1977)]
BEBC,3 [Colley et al., Zeit.Phys.C2:187 (1979)]
BEBC,6 [Bosetti et al., Phys.Lett.B110:167 (1982)]
BEBC,7 [Parker et al., Nucl.Phys.B232:1 (1984)]
BNL_7FT,1 [Fanourakis et al., Phys.Rev.D21:562 (1980)
CCFR,3 [Seligman et al., Nevis Report 292 (1996)]
CHARM,1 [Jonker et al., Phys.Lett.B99:265 (1981)]
CHARM,5 [Allaby et al., Zeit.Phys.C38:403 (1988)]
FNAL_15FT,4 [Taylor et al., Phys.Rev.Lett.51:739 (1983)
FNAL_15FT,5 [Asratyan et al., Phys.Lett.B137:122 (1984
Gargamelle,1 [Eichten et al., Phys.Lett.B46:274 (1973)]
Gargamelle,11 [Erriquez et al., Phys.Lett.B80:309 (1979)
Gargamelle,13 [Morfin et al., Phys.Lett.B104:235 (1981)
IHEP_ITEP,1 [Asratyan et al., Phys.Lett.B76:239 (1978)]
IHEP_ITEP,3 [Vovenko et al., Sov.J.Nucl.Phys.30:528 (1
IHEP_JINR,1 [Anikeev et al., Zeit.Phys.C70:39 (1996)]
MINOS,1 [Adamson et al., Phys.Rev.D81:072002 (2010)]
numubarCC_all:trunk:G00_00a:numu_freenuc
numubarCC_all:trunk:G16_01a:numu_freenuc
numubarCC_all:trunk:G16_02a:numu_freenuc



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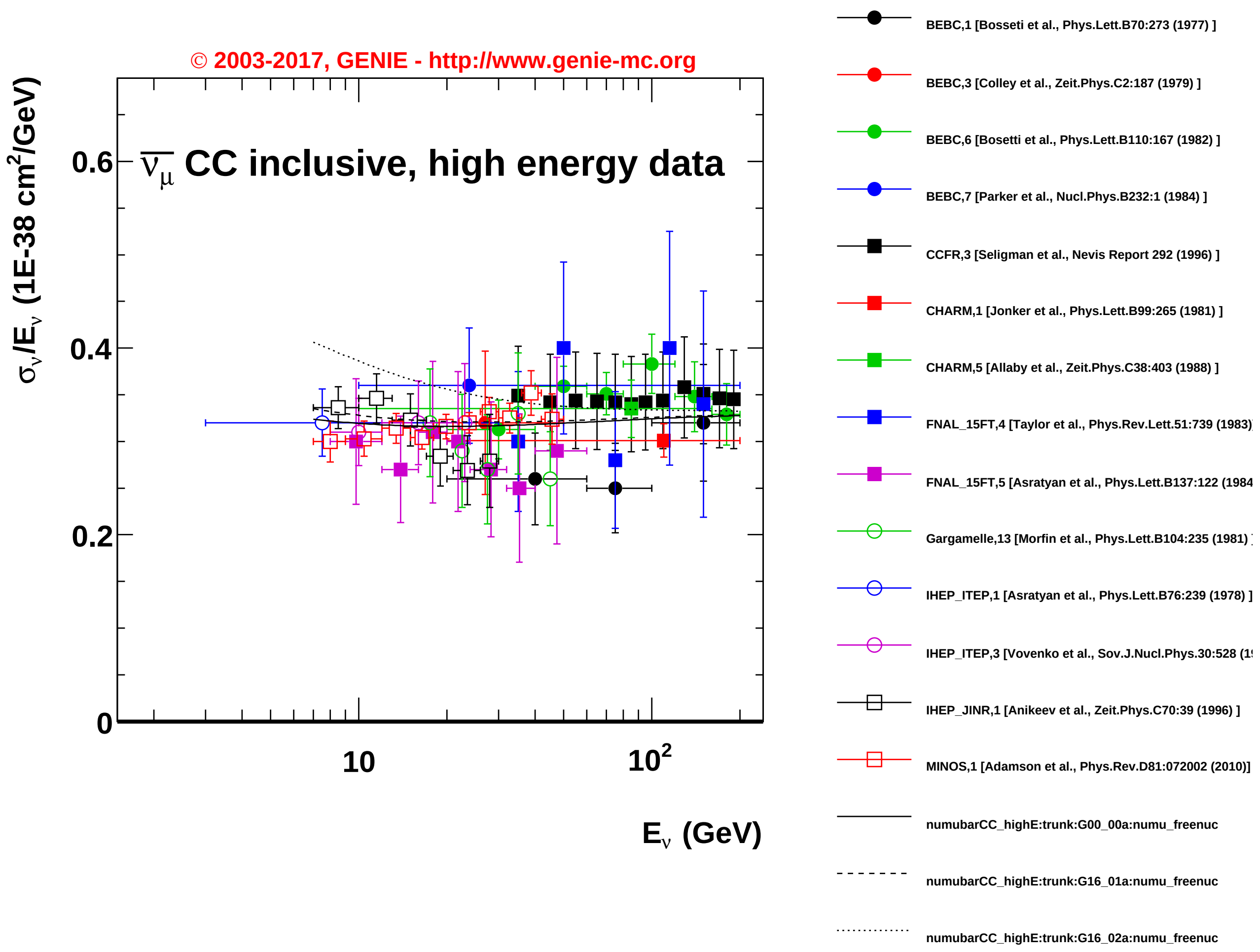
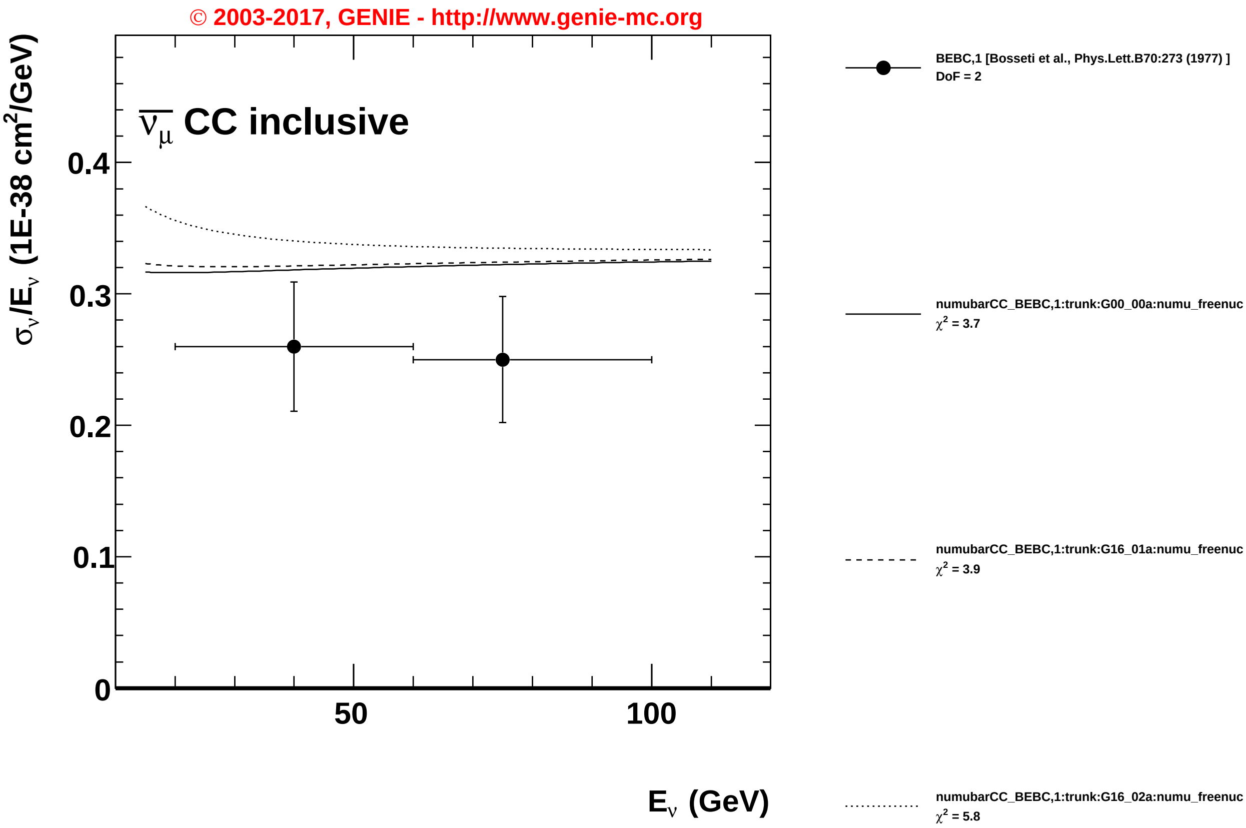
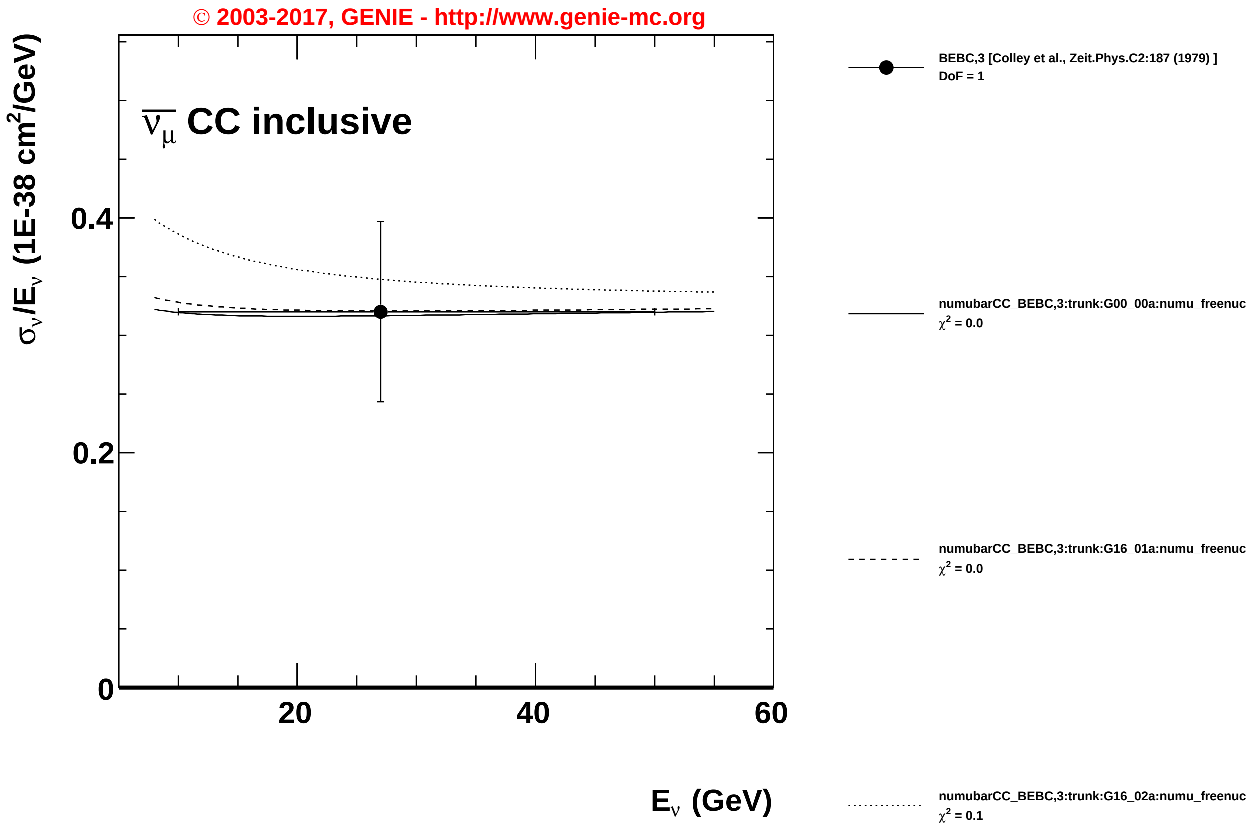
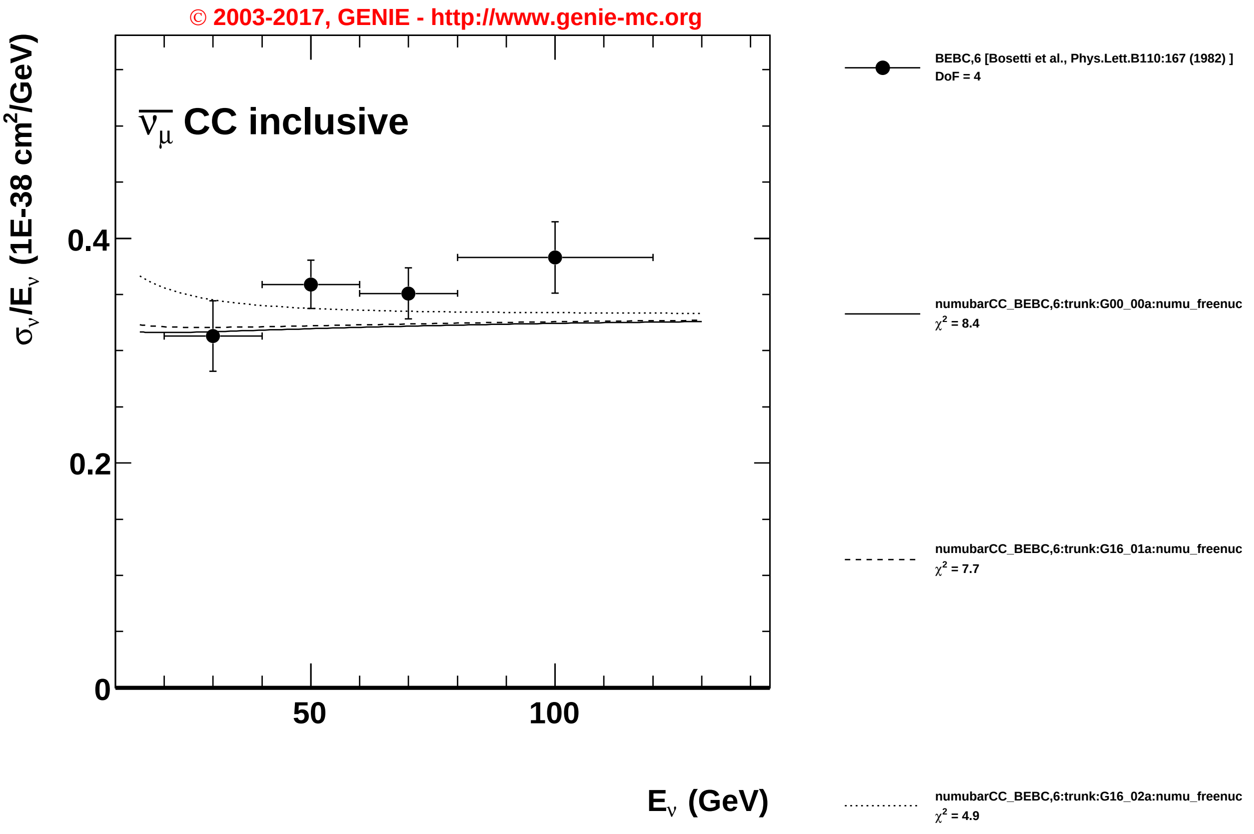
$\overline{\nu_\mu}$ CC inclusive, low energy data
σ_ν/E_ν (1E-38 cm^2/GeV)
0.6
0.4
0.2
0
5
10
E_ν (GeV)
BNL_7FT,1 [Fanourakis et al., Phys.Rev.D21:562 (1980)
Gargamelle,1 [Eichten et al., Phys.Lett.B46:274 (1973)]
Gargamelle,11 [Erriquez et al., Phys.Lett.B80:309 (1979)
IHEP_ITEP,3 [Vovenko et al., Sov.J.Nucl.Phys.30:528
IHEP_JINR,1 [Anikeev et al., Zeit.Phys.C70:39 (1996)]
MINOS,1 [Adamson et al., Phys.Rev.D81:072002 (2010)]
numubarCC_lowE:trunk:G00_00a:numu_freenuc
numubarCC_lowE:trunk:G16_01a:numu_freenuc
numubarCC_lowE:trunk:G16_02a:numu_freenuc

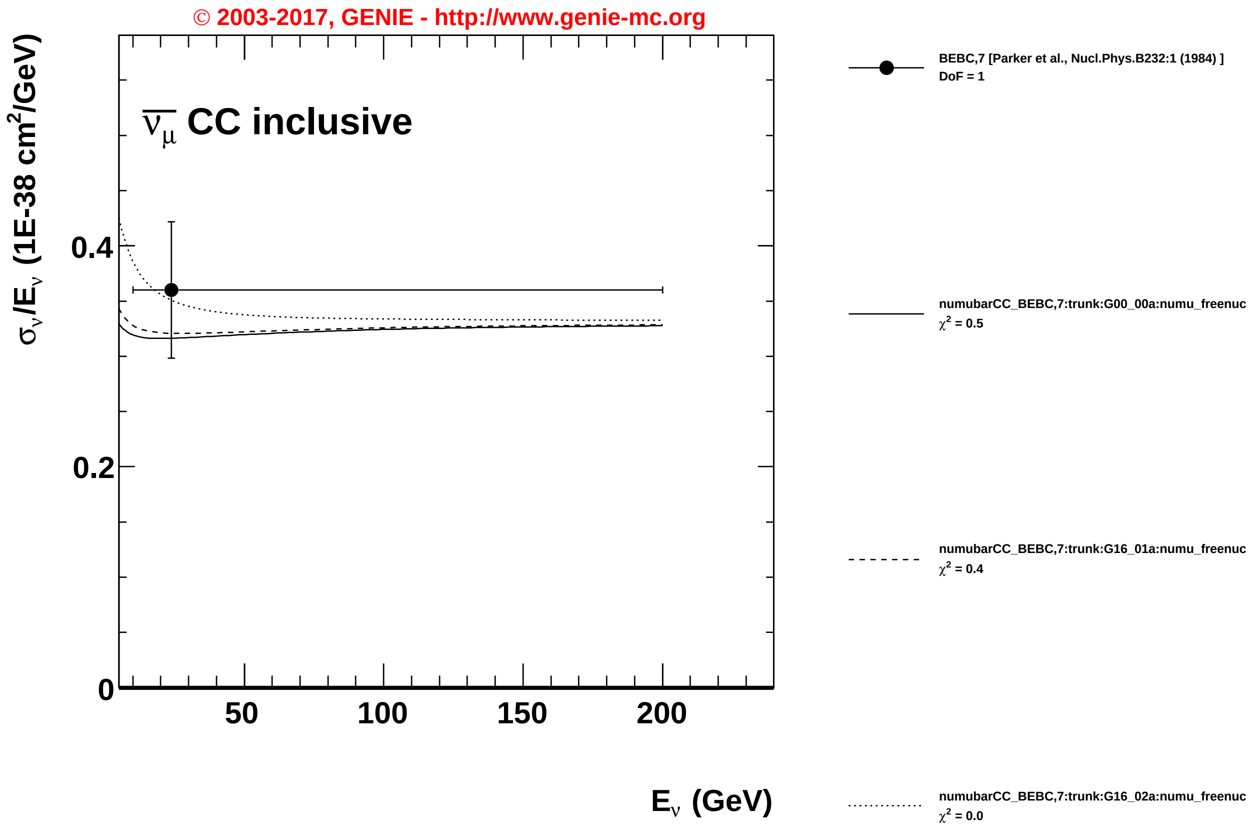

© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive, high energy data
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.2
0.4
0.6
10
10^2
BEBC,1 [Bosseti et al., Phys.Lett.B70:273 (1977)]
BEBC,3 [Colley et al., Zeit.Phys.C2:187 (1979)]
BEBC,6 [Bosetti et al., Phys.Lett.B110:167 (1982)]
BEBC,7 [Parker et al., Nucl.Phys.B232:1 (1984)]
CCFR,3 [Seligman et al., Nevis Report 292 (1996)]
CHARM,1 [Jonker et al., Phys.Lett.B99:265 (1981)]
CHARM,5 [Allaby et al., Zeit.Phys.C38:403 (1988)]
FNAL_15FT,4 [Taylor et al., Phys.Rev.Lett.51:739 (1983)
FNAL_15FT,5 [Asratyan et al., Phys.Lett.B137:122 (1984
Gargamelle,13 [Morfin et al., Phys.Lett.B104:235 (1981)
IHEP_ITEP,1 [Asratyan et al., Phys.Lett.B76:239 (1978)]
IHEP_ITEP,3 [Vovenko et al., Sov.J.Nucl.Phys.30:528 (1
IHEP_JINR,1 [Anikeev et al., Zeit.Phys.C70:39 (1996)]
MINOS,1 [Adamson et al., Phys.Rev.D81:072002 (2010)]
numubarCC_highE:trunk:G00_00a:numu_freenuc
numubarCC_highE:trunk:G16_01a:numu_freenuc
numubarCC_highE:trunk:G16_02a:numu_freenuc


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.1
0.2
0.3
0.4
50
100
E_ν (GeV)
BEBC,1 [Bosseti et al., Phys.Lett.B70:273 (1977)]
DoF = 2
numubarCC_BEBC,1:trunk:G00_00a:numu_freenuc
χ^2 = 3.7
numubarCC_BEBC,1:trunk:G16_01a:numu_freenuc
χ^2 = 3.9
numubarCC_BEBC,1:trunk:G16_02a:numu_freenuc
χ^2 = 5.8

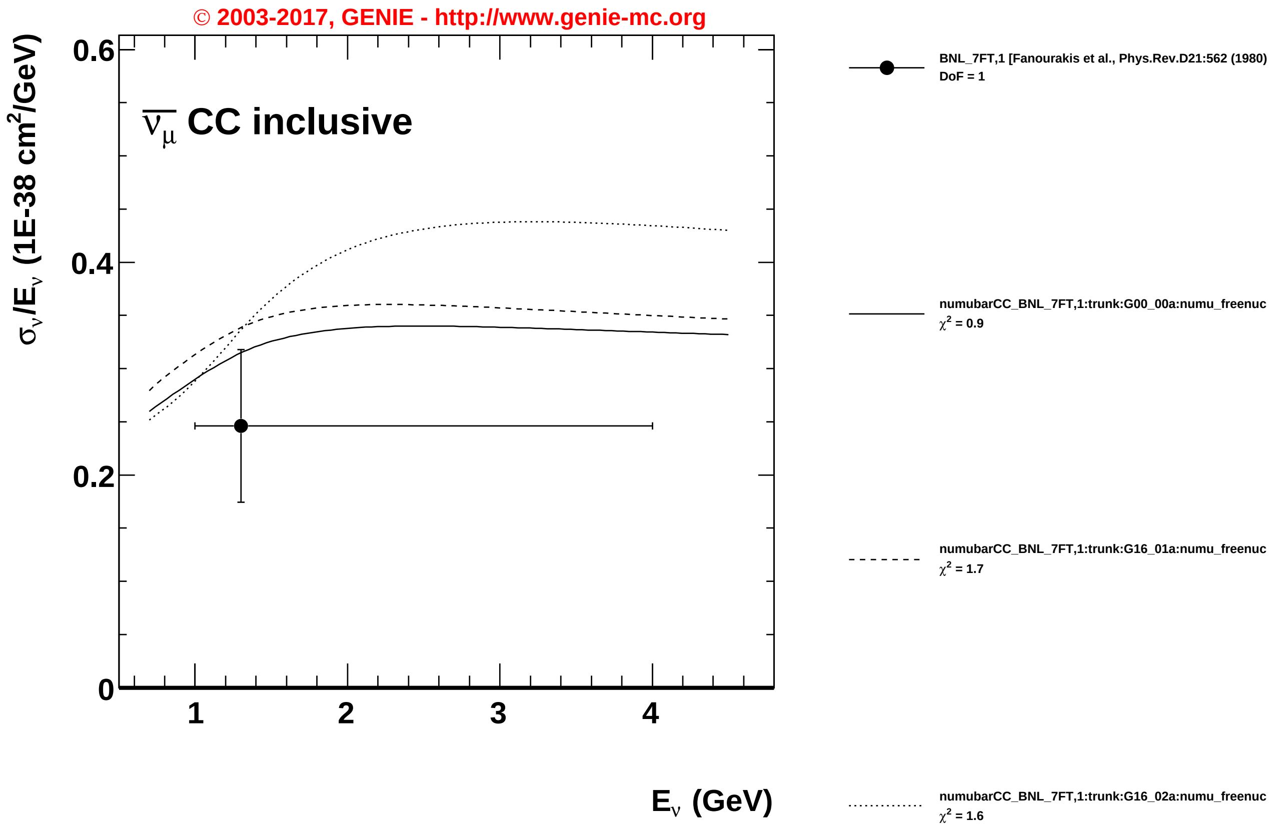


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.2
0.4
20
40
60
E_ν (GeV)
BEBC,3 [Colley et al., Zeit.Phys.C2:187 (1979)]
DoF = 1
numubarCC_BEBC,3:trunk:G00_00a:numu_freenuc
χ^2 = 0.0
numubarCC_BEBC,3:trunk:G16_01a:numu_freenuc
χ^2 = 0.0
numubarCC_BEBC,3:trunk:G16_02a:numu_freenuc
χ^2 = 0.1

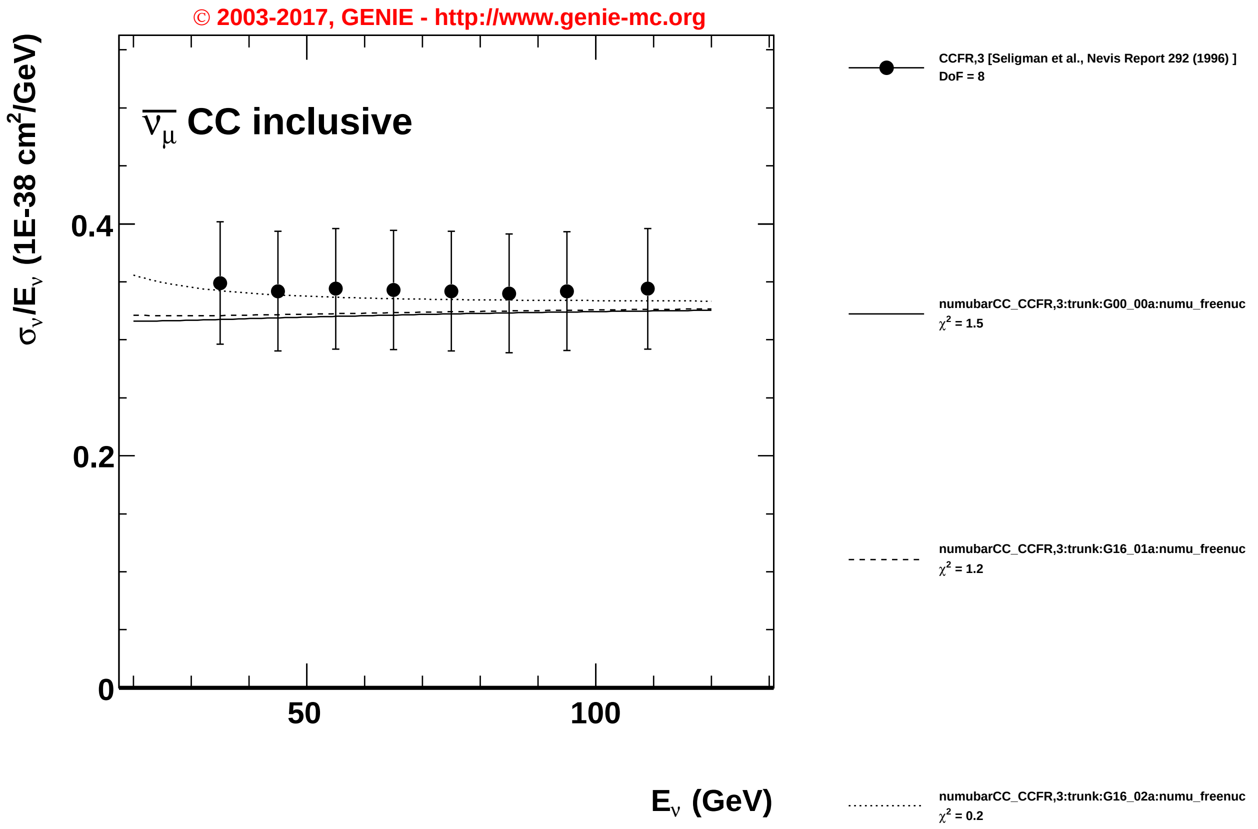

© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0.4
0.2
0
50
100
E_ν (GeV)
BEBC,6 [Bosetti et al., Phys.Lett.B110:167 (1982)]
DoF = 4
numubarCC_BEBC,6:trunk:G00_00a:numu_freenuc
χ^2 = 8.4
numubarCC_BEBC,6:trunk:G16_01a:numu_freenuc
χ^2 = 7.7
numubarCC_BEBC,6:trunk:G16_02a:numu_freenuc
χ^2 = 4.9

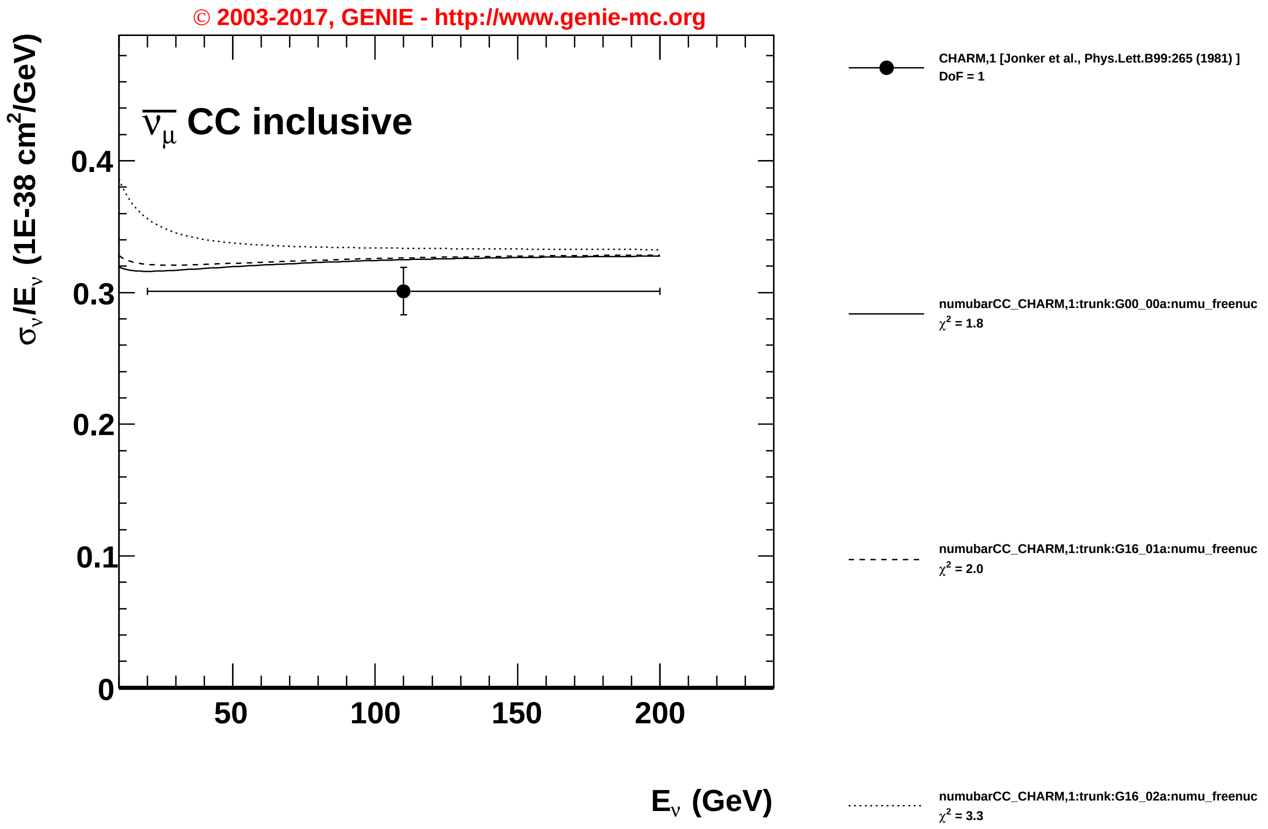


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.2
0.4
50
100
150
200
E_ν (GeV)
BEBC,7 [Parker et al., Nucl.Phys.B232:1 (1984)]
DoF = 1
numubarCC_BEBC,7:trunk:G00_00a:numu_freenuc
χ^2 = 0.5
numubarCC_BEBC,7:trunk:G16_01a:numu_freenuc
χ^2 = 0.4
numubarCC_BEBC,7:trunk:G16_02a:numu_freenuc
χ^2 = 0.0

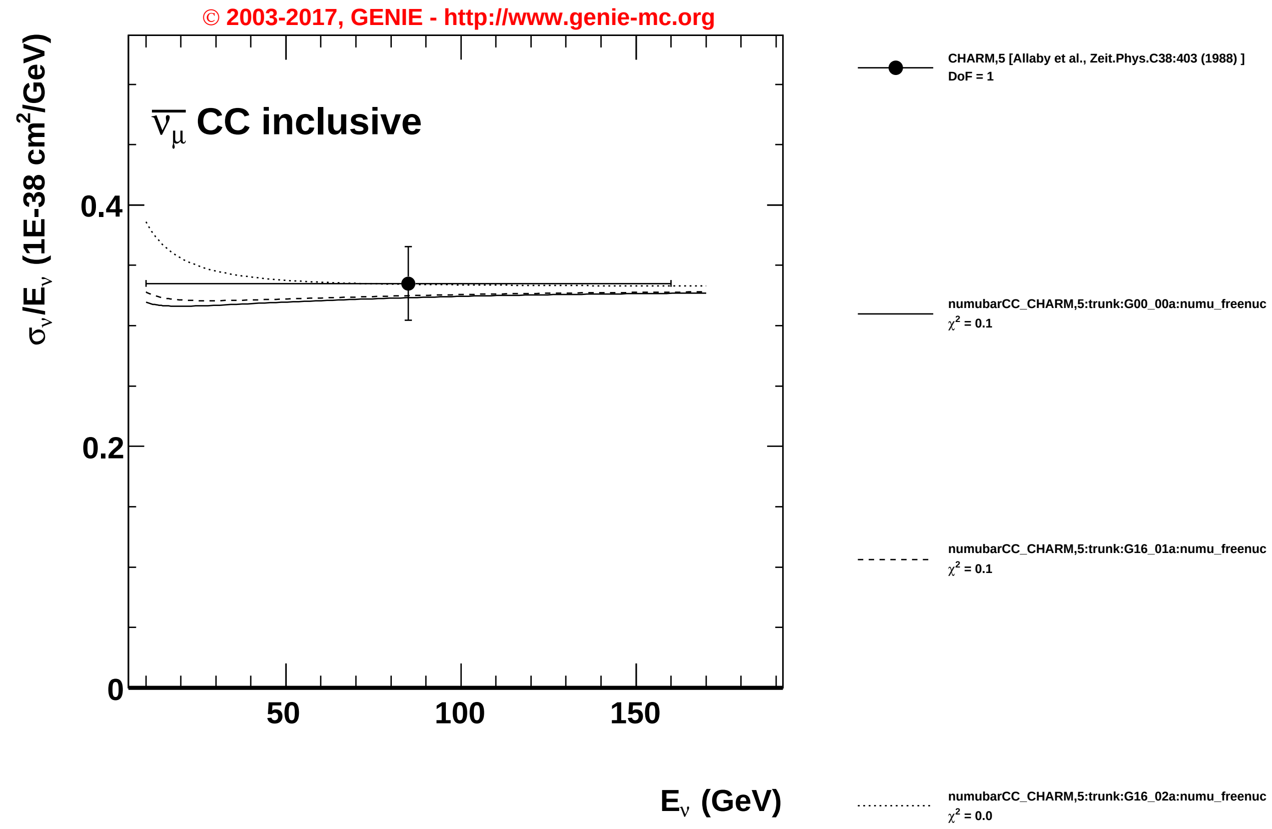


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.2
0.4
0.6
1
2
3
4
BNL_7FT,1 [Fanourakis et al., Phys.Rev.D21:562 (1980)
DoF = 1
numubarCC_BNL_7FT,1:trunk:G00_00a:numu_freenuc
χ^2 = 0.9
numubarCC_BNL_7FT,1:trunk:G16_01a:numu_freenuc
χ^2 = 1.7
numubarCC_BNL_7FT,1:trunk:G16_02a:numu_freenuc
χ^2 = 1.6

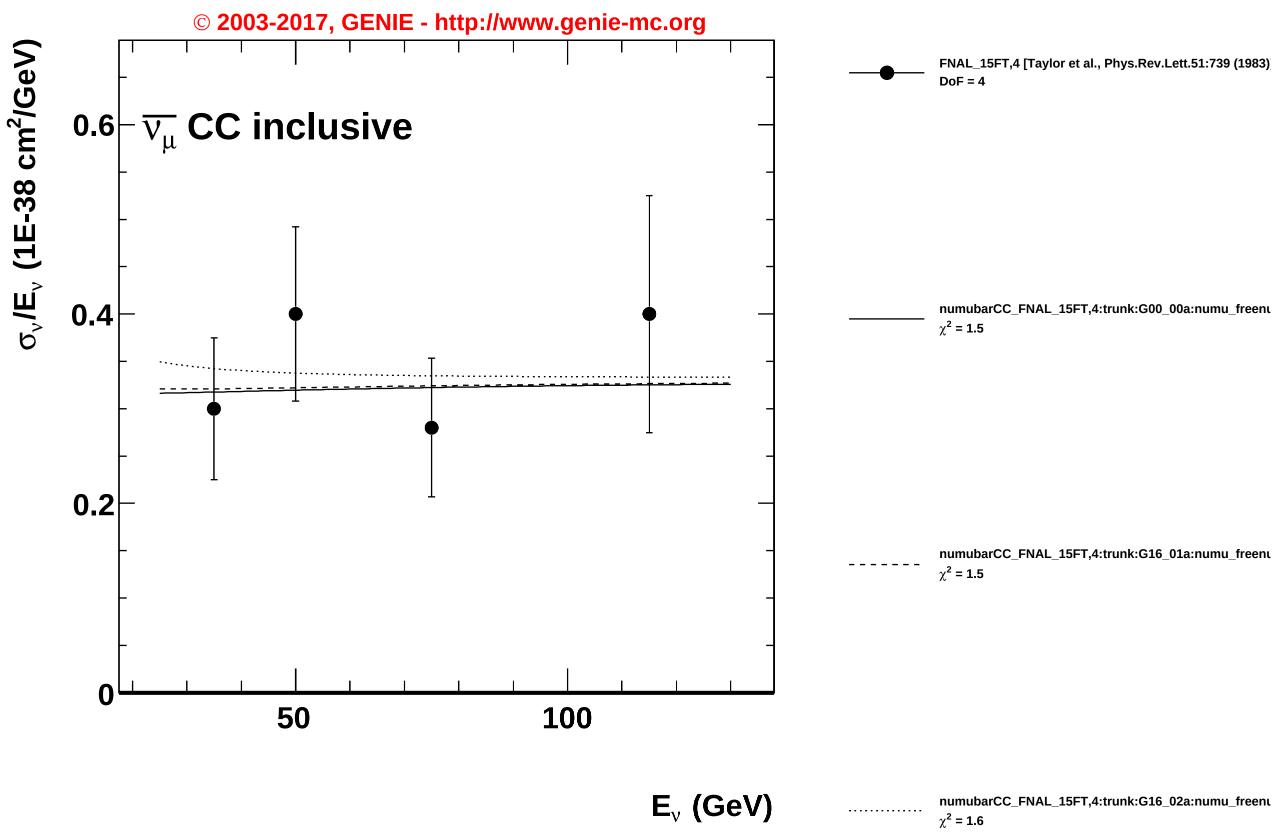

© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0.4
0.2
0
50
100
E_ν (GeV)
CCFR,3 [Seligman et al., Nevis Report 292 (1996)]
DoF = 8
numubarCC_CCFR,3:trunk:G00_00a:numu_freenuc
χ^2 = 1.5
numubarCC_CCFR,3:trunk:G16_01a:numu_freenuc
χ^2 = 1.2
numubarCC_CCFR,3:trunk:G16_02a:numu_freenuc
χ^2 = 0.2

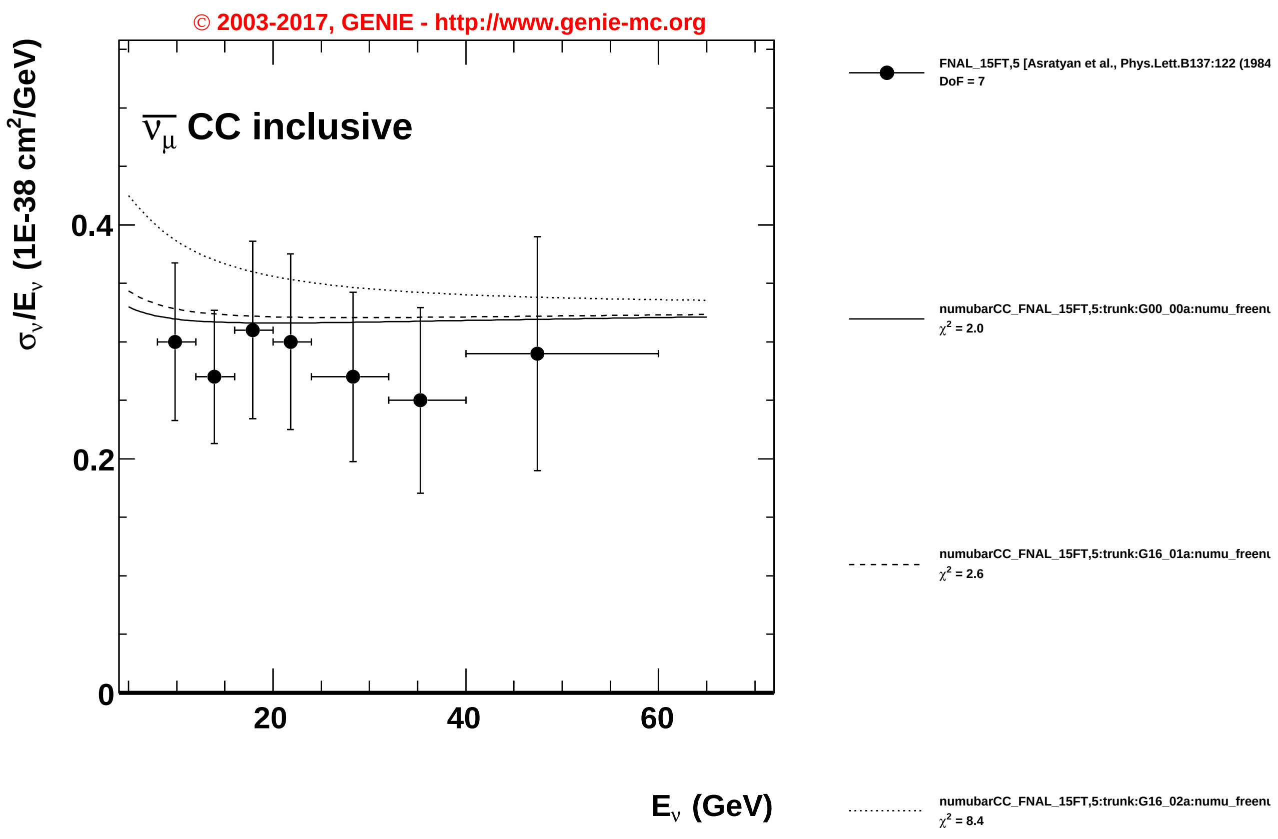


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0.4
0.3
0.2
0.1
0
50
100
150
200
E_ν (GeV)
CHARM,1 [Jonker et al., Phys.Lett.B99:265 (1981)]
DoF = 1
numubarCC_CHARM,1:trunk:G00_00a:numu_freenuc
χ^2 = 1.8
numubarCC_CHARM,1:trunk:G16_01a:numu_freenuc
χ^2 = 2.0
numubarCC_CHARM,1:trunk:G16_02a:numu_freenuc
χ^2 = 3.3

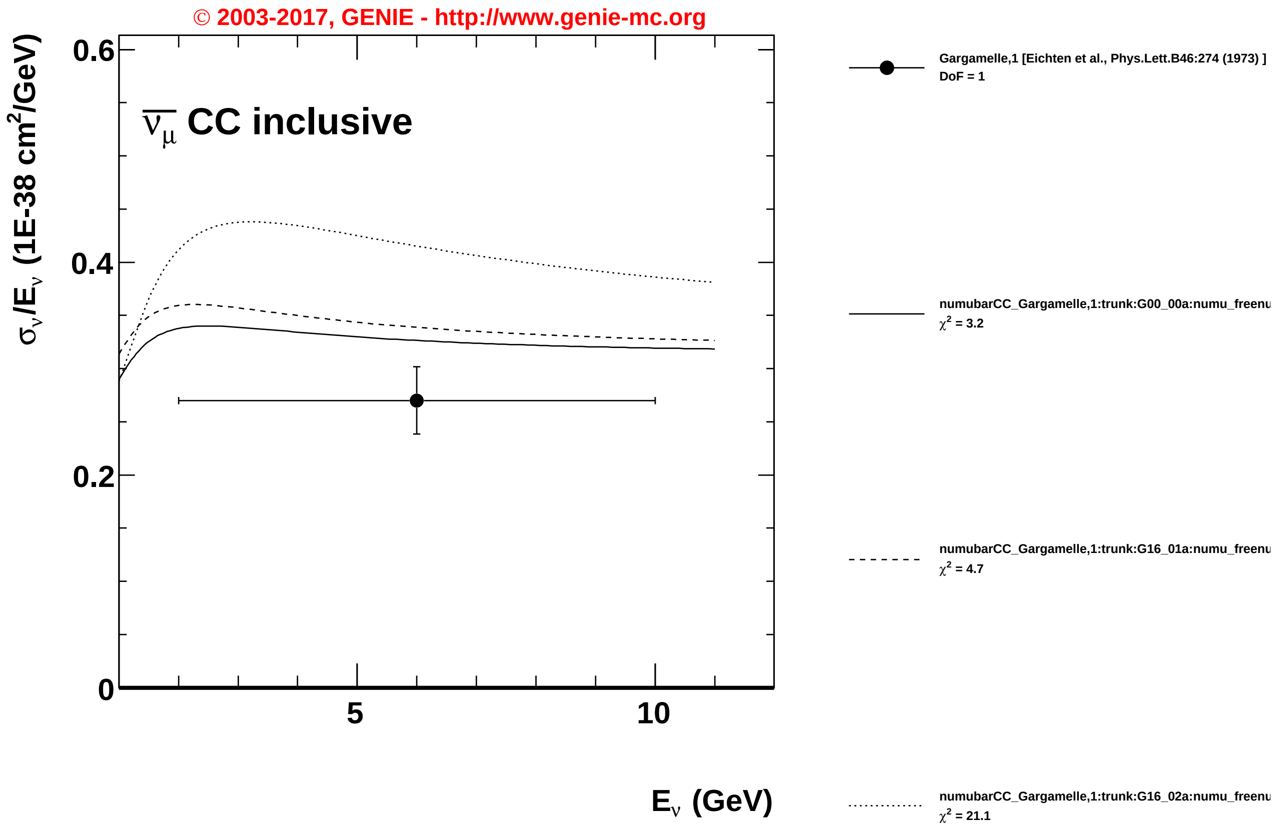


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0.4
0.2
0
50
100
150
E_ν (GeV)
CHARM,5 [Allaby et al., Zeit.Phys.C38:403 (1988)]
DoF = 1
numubarCC_CHARM,5:trunk:G00_00a:numu_freenuc
χ^2 = 0.1
numubarCC_CHARM,5:trunk:G16_01a:numu_freenuc
χ^2 = 0.1
numubarCC_CHARM,5:trunk:G16_02a:numu_freenuc
χ^2 = 0.0

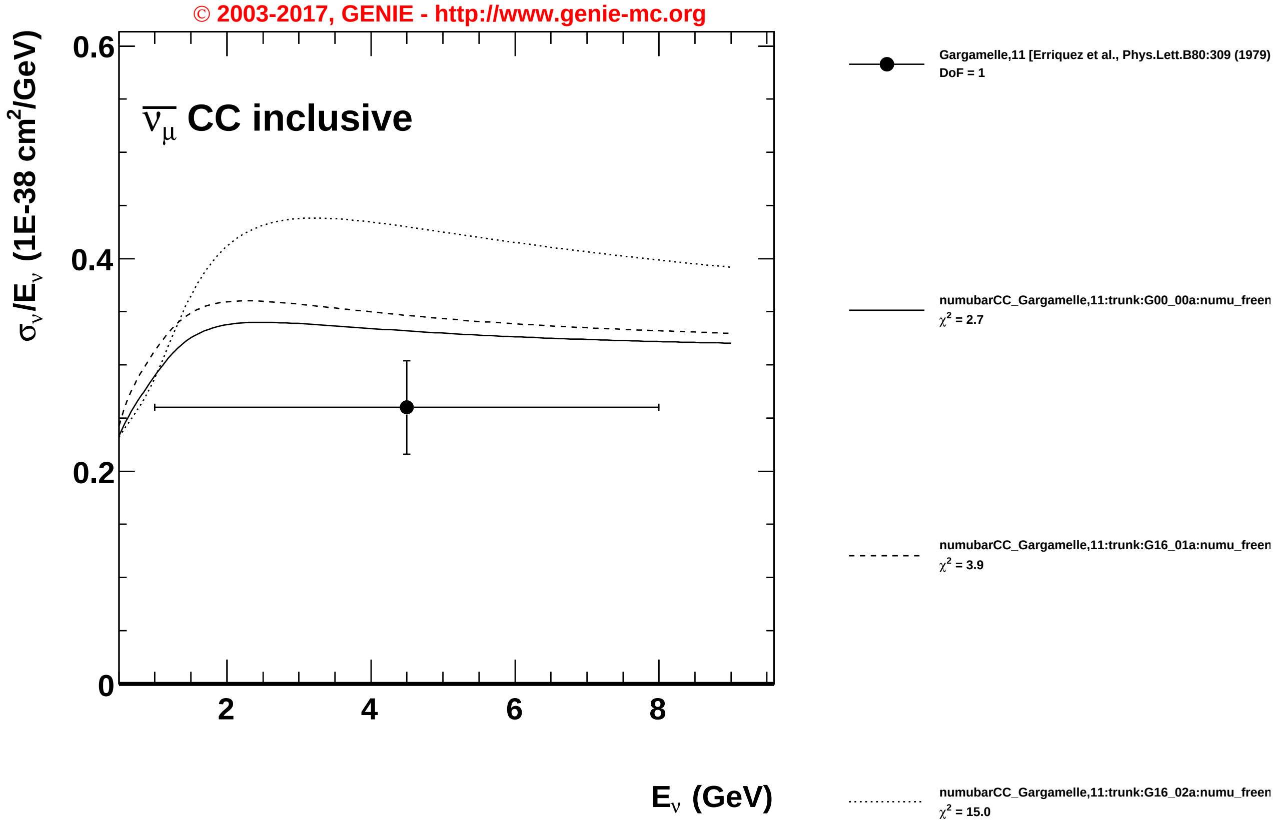

© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.2
0.4
0.6
50
100
FNAL_15FT,4 [Taylor et al., Phys.Rev.Lett.51:739 (1983)
DoF = 4
numubarCC_FNAL_15FT,4:trunk:G00_00a:numu_freenu
χ^2 = 1.5
numubarCC_FNAL_15FT,4:trunk:G16_01a:numu_freenu
χ^2 = 1.5
numubarCC_FNAL_15FT,4:trunk:G16_02a:numu_freenu
χ^2 = 1.6



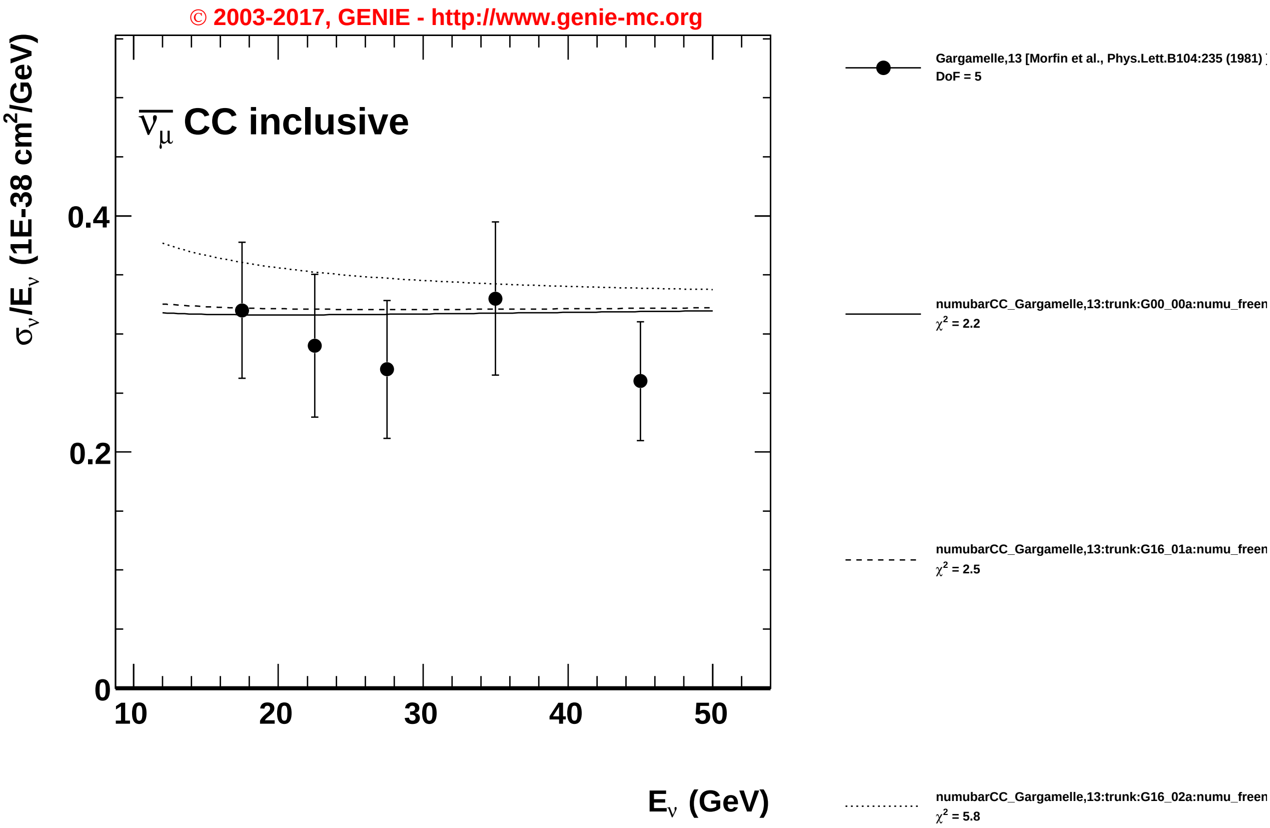
© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.2
0.4
20
40
60
E_ν (GeV)
FNAL_15FT,5 [Asratyan et al., Phys.Lett.B137:122 (1984
DoF = 7
numubarCC_FNAL_15FT,5:trunk:G00_00a:numu_freenu
χ^2 = 2.0
numubarCC_FNAL_15FT,5:trunk:G16_01a:numu_freenu
χ^2 = 2.6
numubarCC_FNAL_15FT,5:trunk:G16_02a:numu_freenu
χ^2 = 8.4



© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.2
0.4
0.6
5
10
E_ν (GeV)
Gargamelle,1 [Eichten et al., Phys.Lett.B46:274 (1973)]
DoF = 1
numubarCC_Gargamelle,1:trunk:G00_00a:numu_freenu
χ^2 = 3.2
numubarCC_Gargamelle,1:trunk:G16_01a:numu_freenu
χ^2 = 4.7
numubarCC_Gargamelle,1:trunk:G16_02a:numu_freenu
χ^2 = 21.1



© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0.6
0.4
0.2
0
2
4
6
8
E_ν (GeV)
Gargamelle,11 [Erriquez et al., Phys.Lett.B80:309 (1979)
DoF = 1
numubarCC_Gargamelle,11:trunk:G00_00a:numu_freen
χ^2 = 2.7
numubarCC_Gargamelle,11:trunk:G16_01a:numu_freen
χ^2 = 3.9
numubarCC_Gargamelle,11:trunk:G16_02a:numu_freen
χ^2 = 15.0



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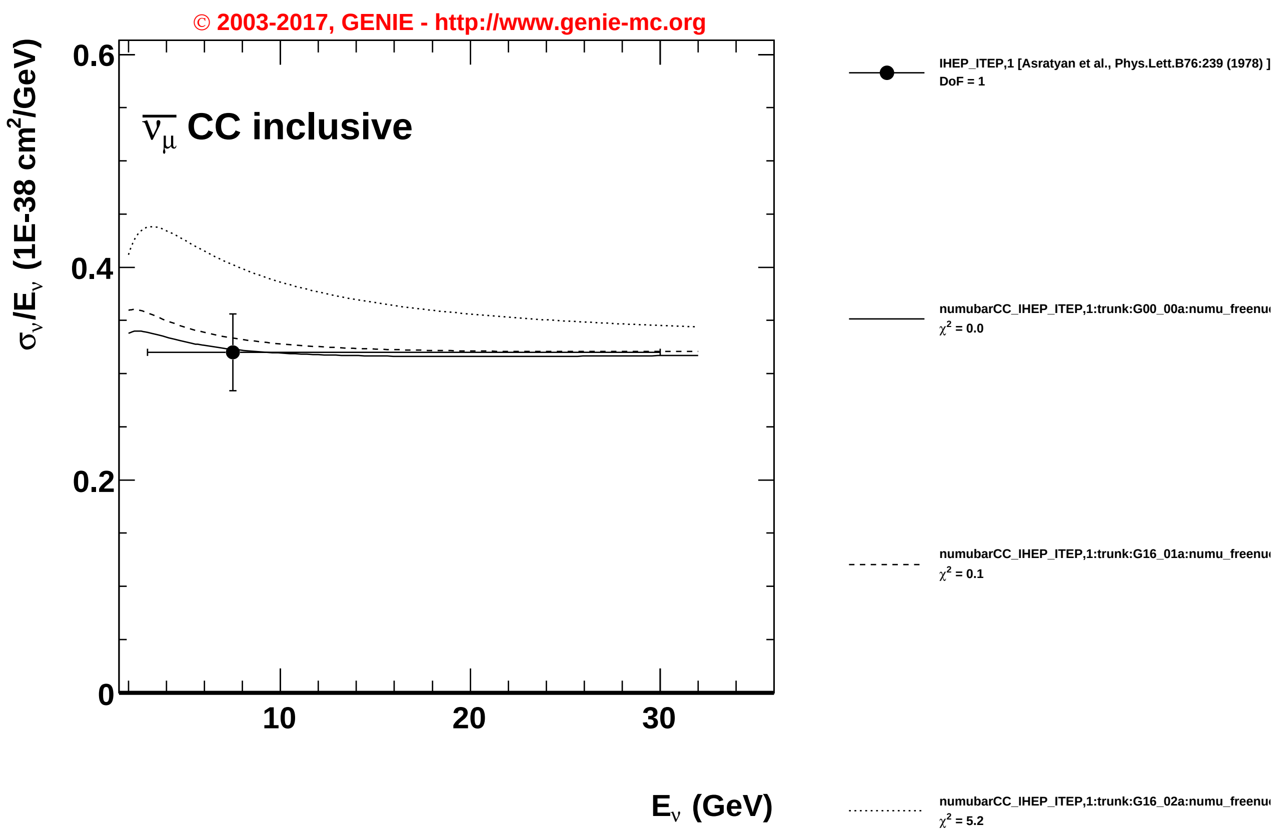
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
E_ν (GeV)
0
0.2
0.4
10
20
30
40
50
Gargamelle,13 [Morfin et al., Phys.Lett.B104:235 (1981)
DoF = 5
numubarCC_Gargamelle,13:trunk:G00_00a:numu_freen
χ^2 = 2.2
numubarCC_Gargamelle,13:trunk:G16_01a:numu_freen
χ^2 = 2.5
numubarCC_Gargamelle,13:trunk:G16_02a:numu_freen
χ^2 = 5.8



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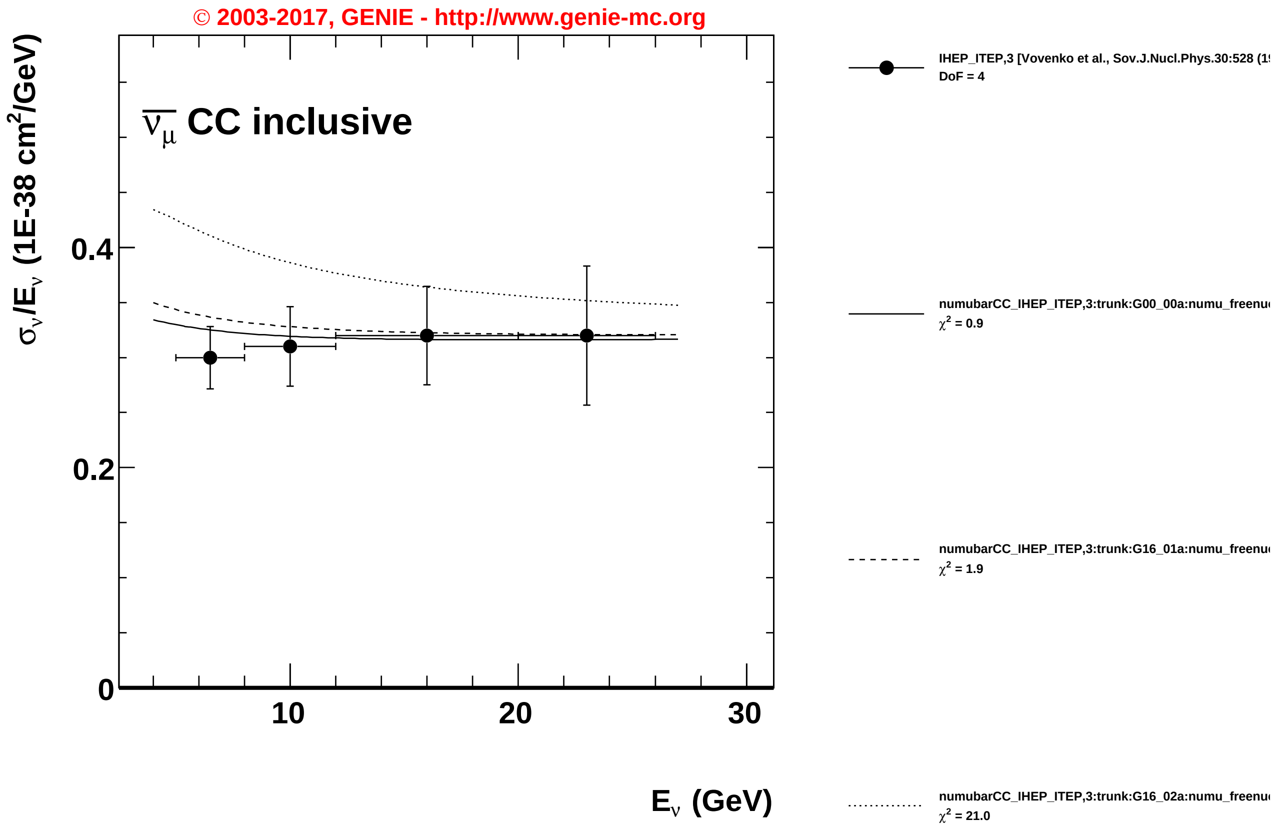
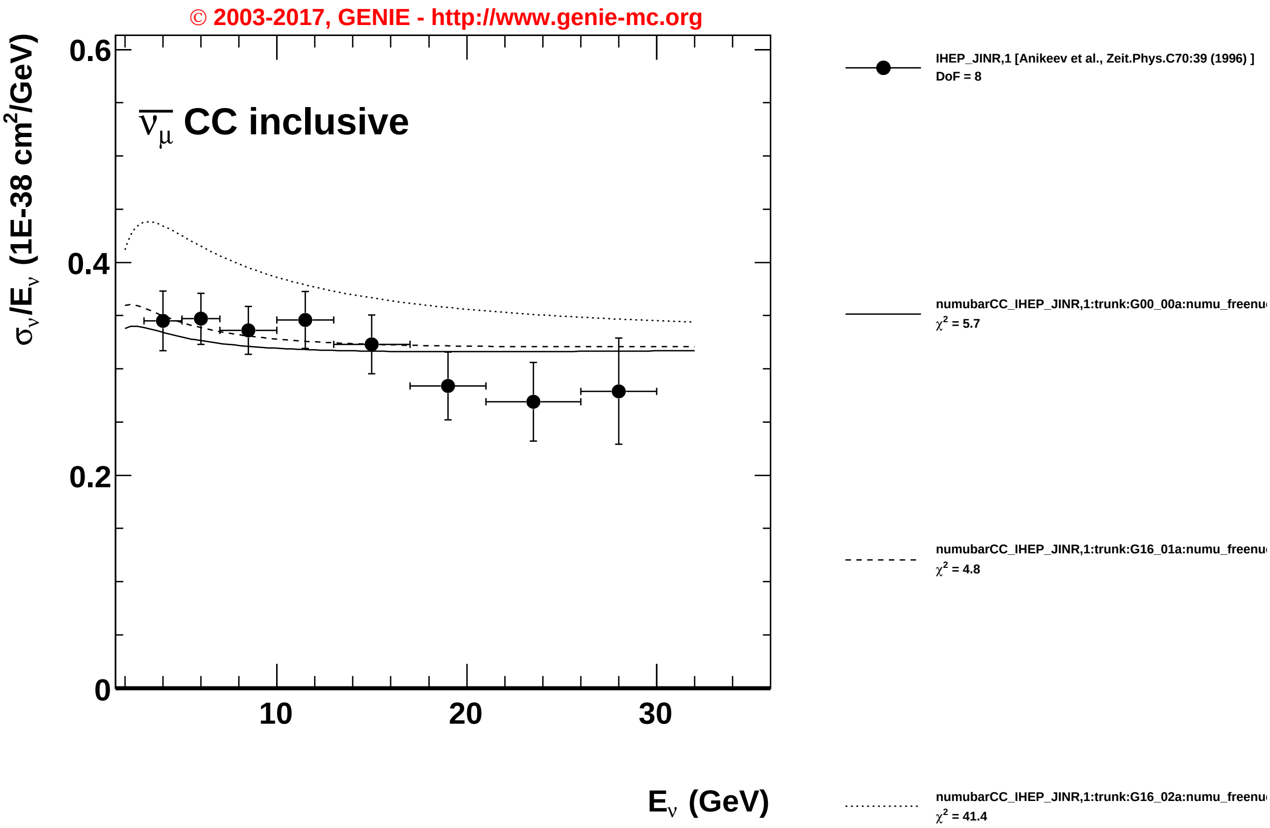
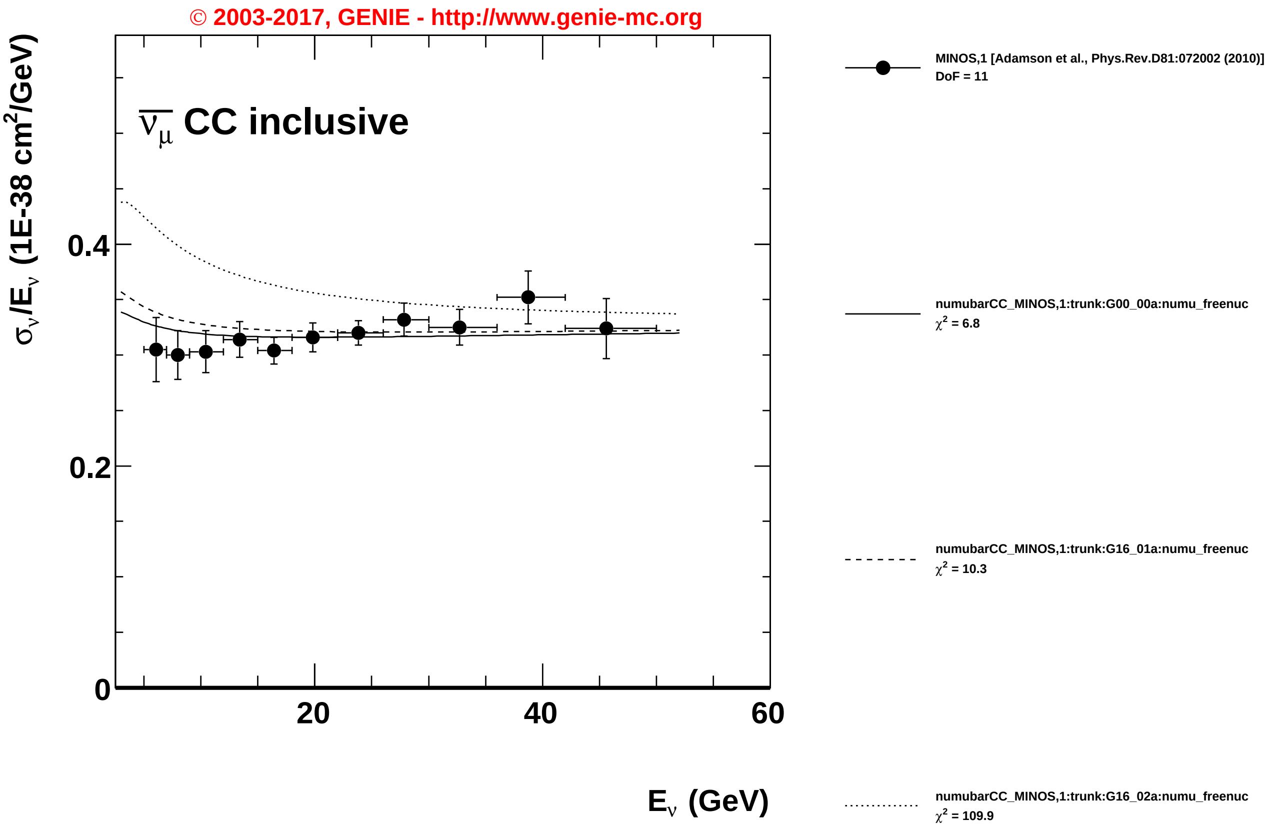
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0.6
0.4
0.2
0
10
20
30
E_ν (GeV)
IHEP_ITEP,1 [Asratyan et al., Phys.Lett.B76:239 (1978)]
DoF = 1
numubarCC_IHEP_ITEP,1:trunk:G00_00a:numu_freenu
χ^2 = 0.0
numubarCC_IHEP_ITEP,1:trunk:G16_01a:numu_freenu
χ^2 = 0.1
numubarCC_IHEP_ITEP,1:trunk:G16_02a:numu_freenu
χ^2 = 5.2


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.2
0.4
10
20
30
E_ν (GeV)
IHEP_ITEP,3 [Vovenko et al., Sov.J.Nucl.Phys.30:528 (1
DoF = 4
numubarCC_IHEP_ITEP,3:trunk:G00_00a:numu_freenu
χ^2 = 0.9
numubarCC_IHEP_ITEP,3:trunk:G16_01a:numu_freenu
χ^2 = 1.9
numubarCC_IHEP_ITEP,3:trunk:G16_02a:numu_freenu
χ^2 = 21.0


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0.6
0.4
0.2
0
10
20
30
E_ν (GeV)
IHEP_JINR,1 [Anikeev et al., Zeit.Phys.C70:39 (1996)]
DoF = 8
numubarCC_IHEP_JINR,1:trunk:G00_00a:numu_freenu
χ^2 = 5.7
numubarCC_IHEP_JINR,1:trunk:G16_01a:numu_freenu
χ^2 = 4.8
numubarCC_IHEP_JINR,1:trunk:G16_02a:numu_freenu
χ^2 = 41.4



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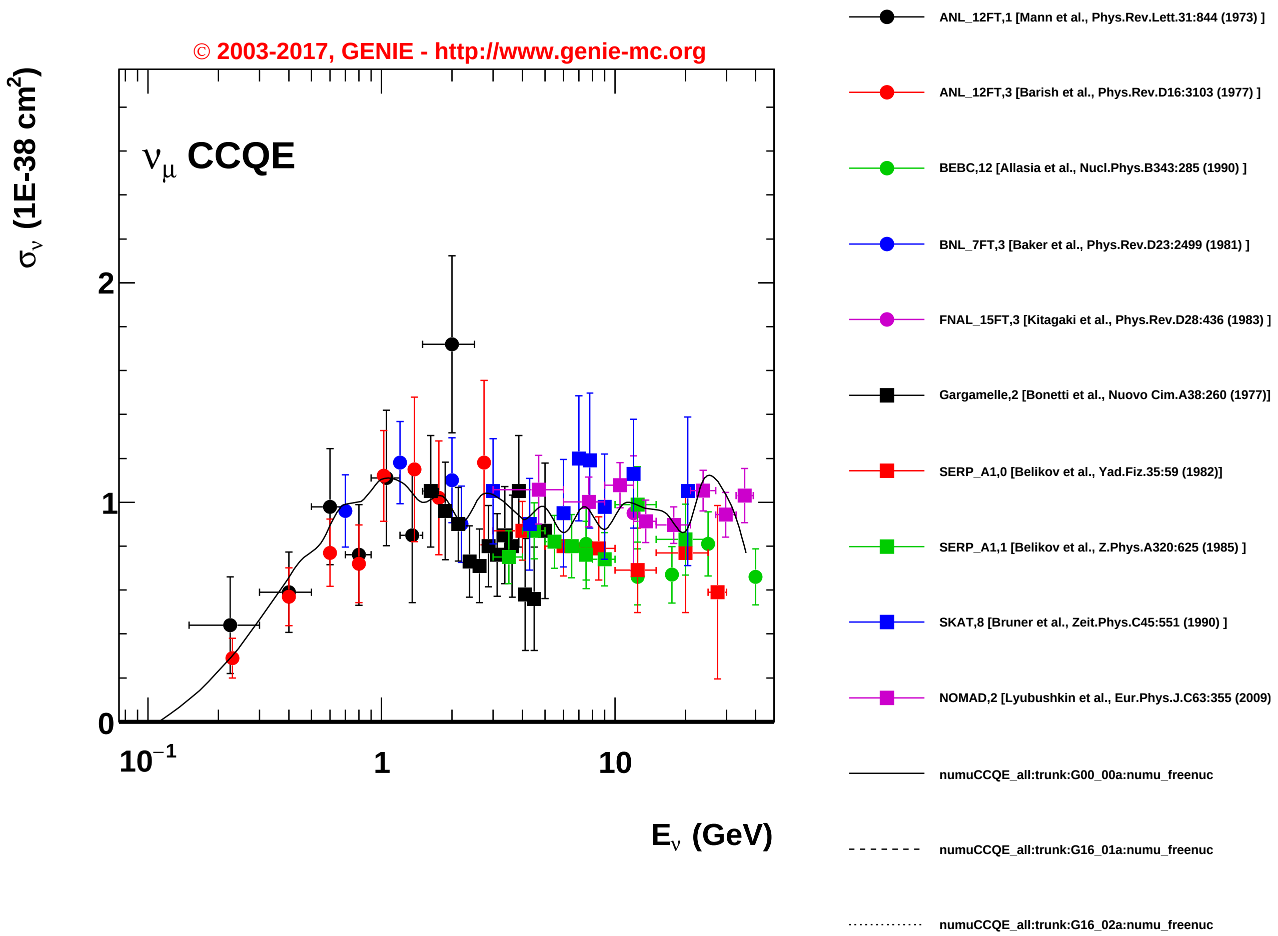
$\overline{\nu_\mu}$ CC inclusive
σ_ν/E_ν (1E-38 cm^2/GeV)
0
0.2
0.4
20
40
60
E_ν (GeV)
MINOS,1 [Adamson et al., Phys.Rev.D81:072002 (2010)]
DoF = 11
numubarCC_MINOS,1:trunk:G00_00a:numu_freenuc
χ^2 = 6.8
numubarCC_MINOS,1:trunk:G16_01a:numu_freenuc
χ^2 = 10.3
numubarCC_MINOS,1:trunk:G16_02a:numu_freenuc
χ^2 = 109.9



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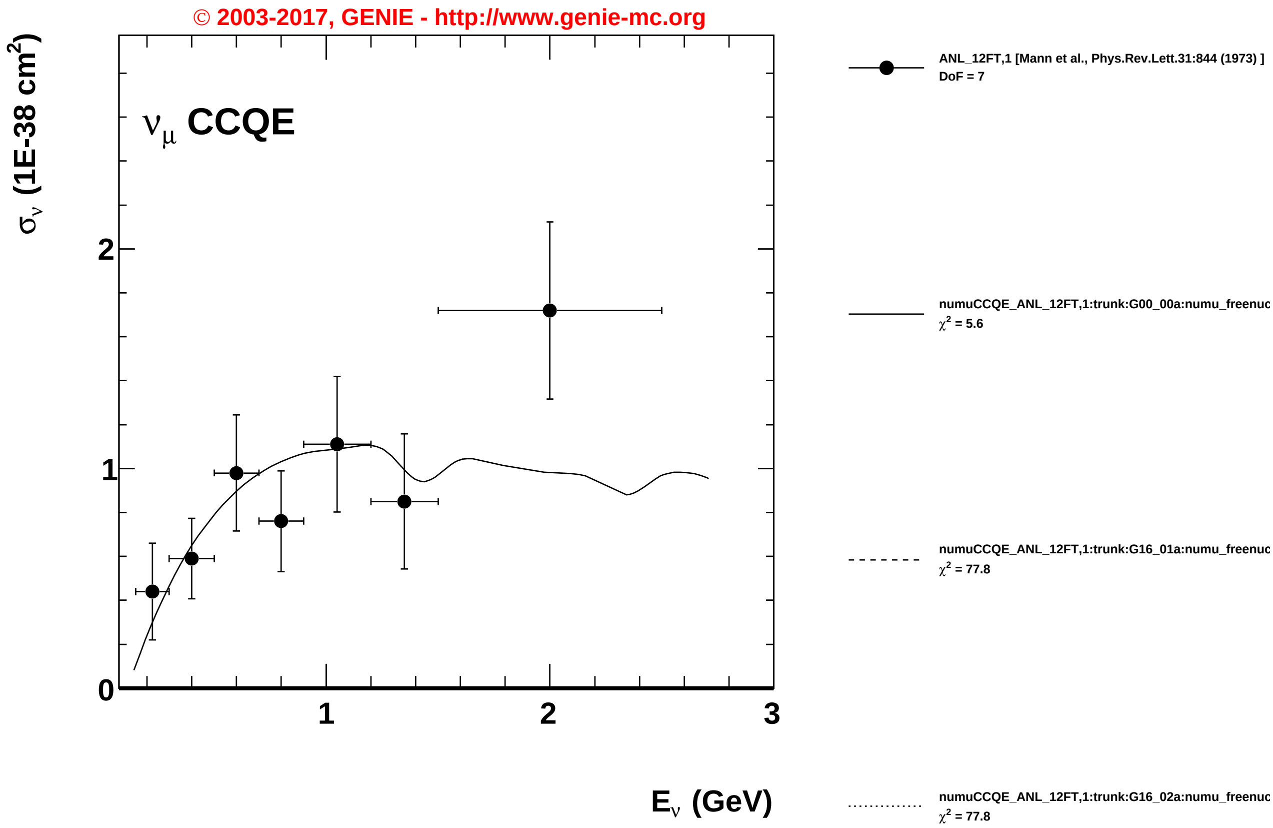
ν_μ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
1
2
10^{-1}
1
10
ANL_12FT,1 [Mann et al., Phys.Rev.Lett.31:844 (1973)]
ANL_12FT,3 [Barish et al., Phys.Rev.D16:3103 (1977)]
BEBC,12 [Allasia et al., Nucl.Phys.B343:285 (1990)]
BNL_7FT,3 [Baker et al., Phys.Rev.D23:2499 (1981)]
FNAL_15FT,3 [Kitagaki et al., Phys.Rev.D28:436 (1983)]
Gargamelle,2 [Bonetti et al., Nuovo Cim.A38:260 (1977)]
SERP_A1,0 [Belikov et al., Yad.Fiz.35:59 (1982)]
SERP_A1,1 [Belikov et al., Z.Phys.A320:625 (1985)]
SKAT,8 [Bruner et al., Zeit.Phys.C45:551 (1990)]
NOMAD,2 [Lyubushkin et al., Eur.Phys.J.C63:355 (2009)
numuCCQE_all:trunk:G00_00a:numu_freenuc
numuCCQE_all:trunk:G16_01a:numu_freenuc
numuCCQE_all:trunk:G16_02a:numu_freenuc



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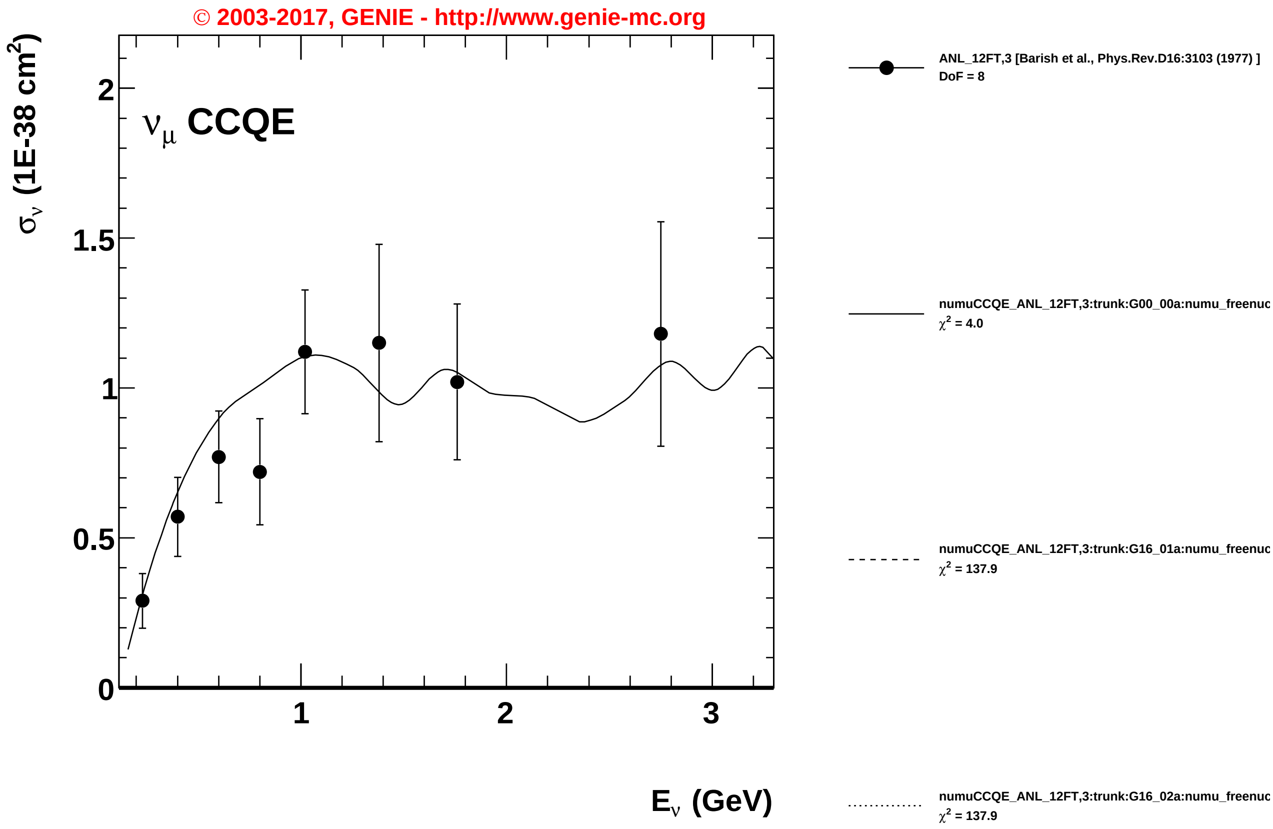
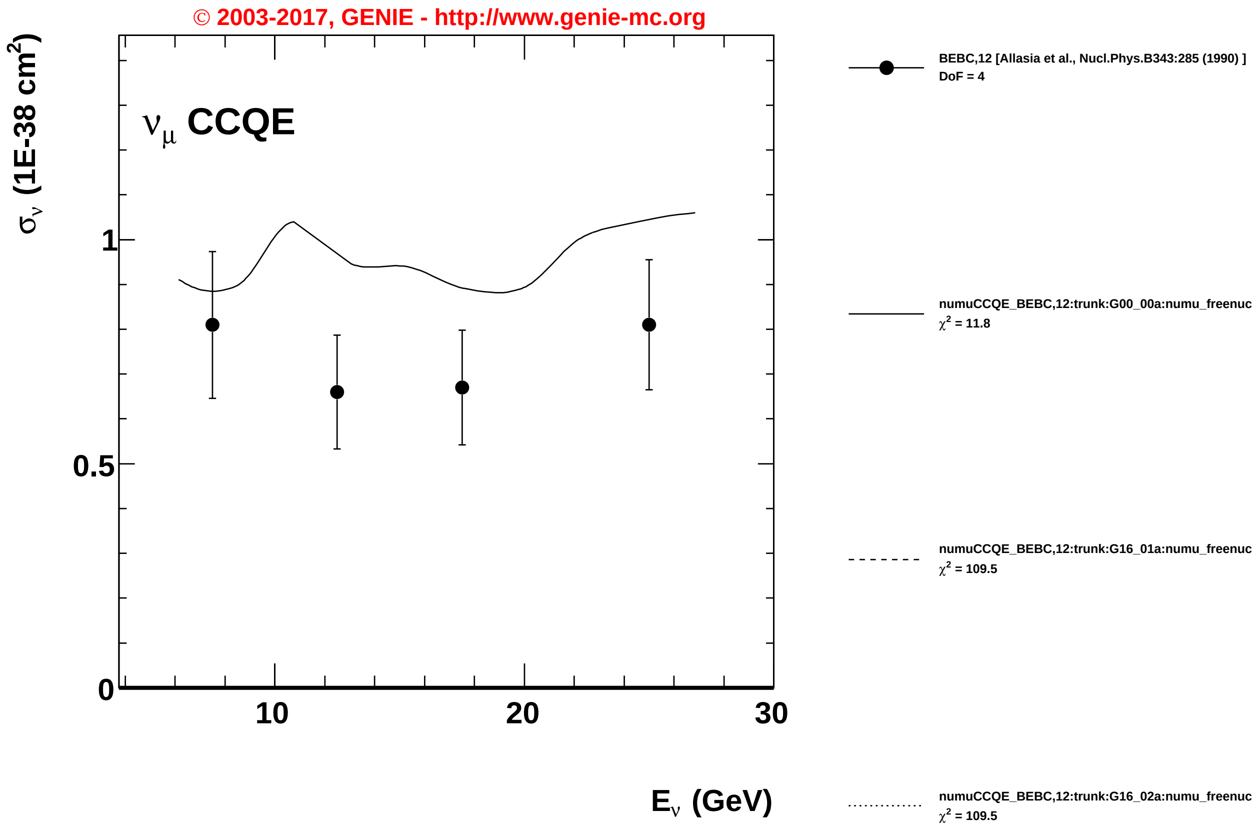
σ_ν (1E-38 cm^2)
ν_μ CCQE
0
1
2
1
2
3
E_ν (GeV)
ANL_12FT,1 [Mann et al., Phys.Rev.Lett.31:844 (1973)]
DoF = 7
numuCCQE_ANL_12FT,1:trunk:G00_00a:numu_freenuc
χ^2 = 5.6
numuCCQE_ANL_12FT,1:trunk:G16_01a:numu_freenuc
χ^2 = 77.8
numuCCQE_ANL_12FT,1:trunk:G16_02a:numu_freenuc
χ^2 = 77.8


© 2003-2017, GENIE - http://www.genie-mc.org
σ_ν (1E-38 cm^2)
ν_μ CCQE
E_ν (GeV)
0
0.5
1
1.5
2
1
2
3
ANL_12FT,3 [Barish et al., Phys.Rev.D16:3103 (1977)]
DoF = 8
numuCCQE_ANL_12FT,3:trunk:G00_00a:numu_freenuc
χ^2 = 4.0
numuCCQE_ANL_12FT,3:trunk:G16_01a:numu_freenuc
χ^2 = 137.9
numuCCQE_ANL_12FT,3:trunk:G16_02a:numu_freenuc
χ^2 = 137.9



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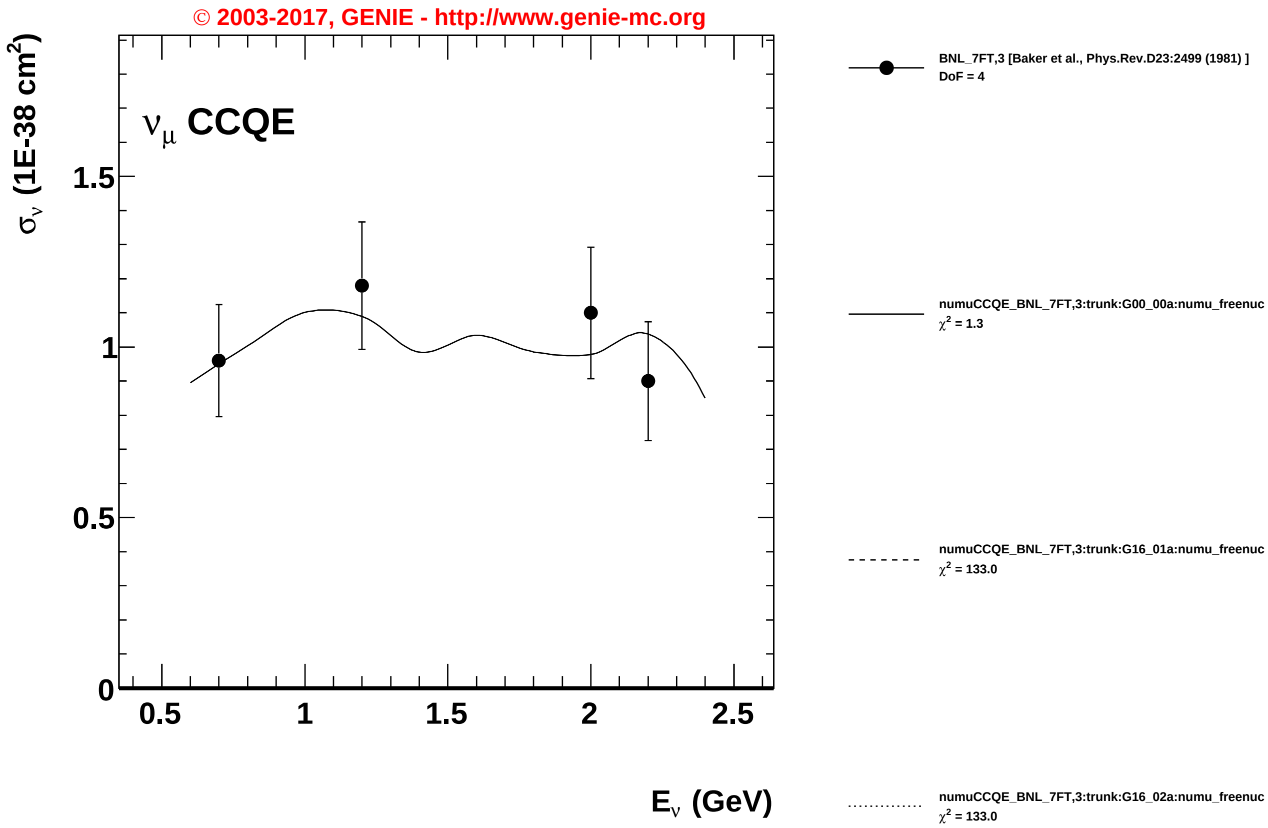
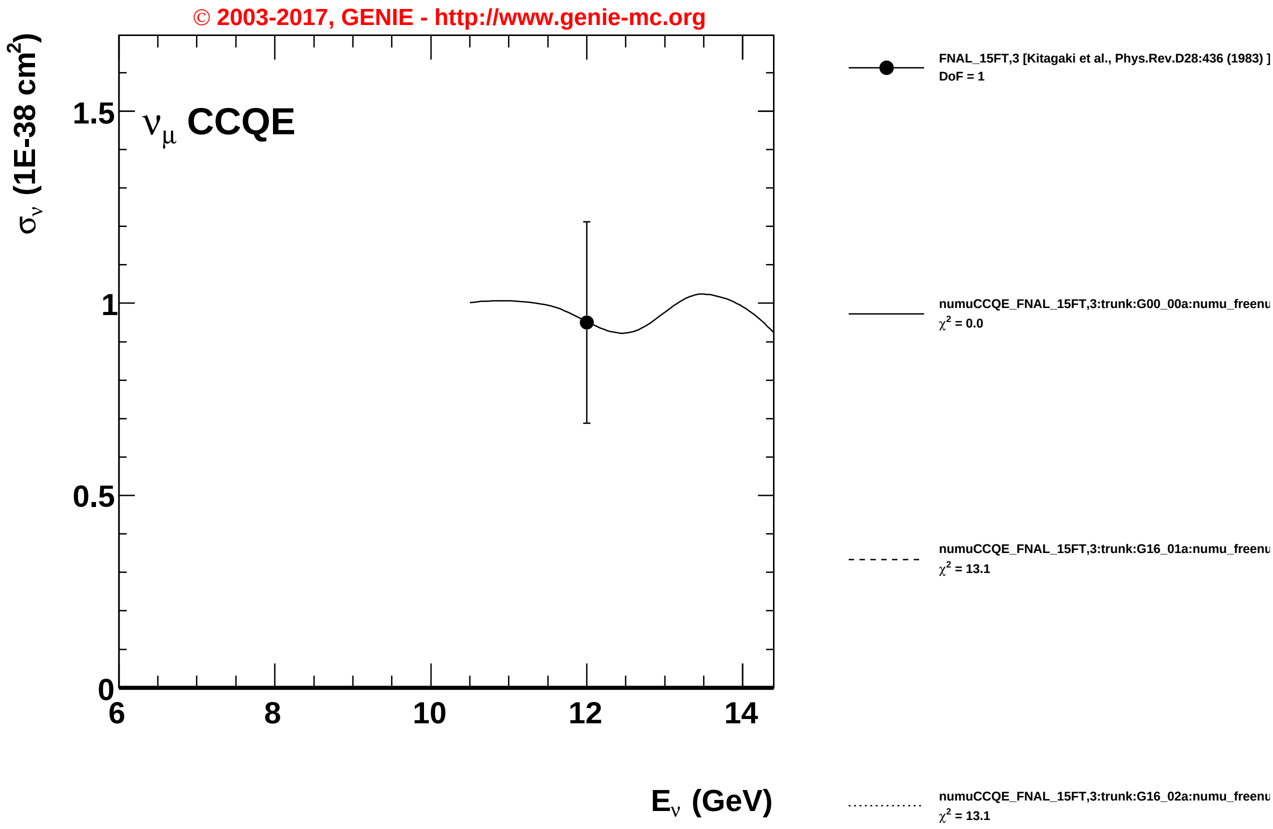
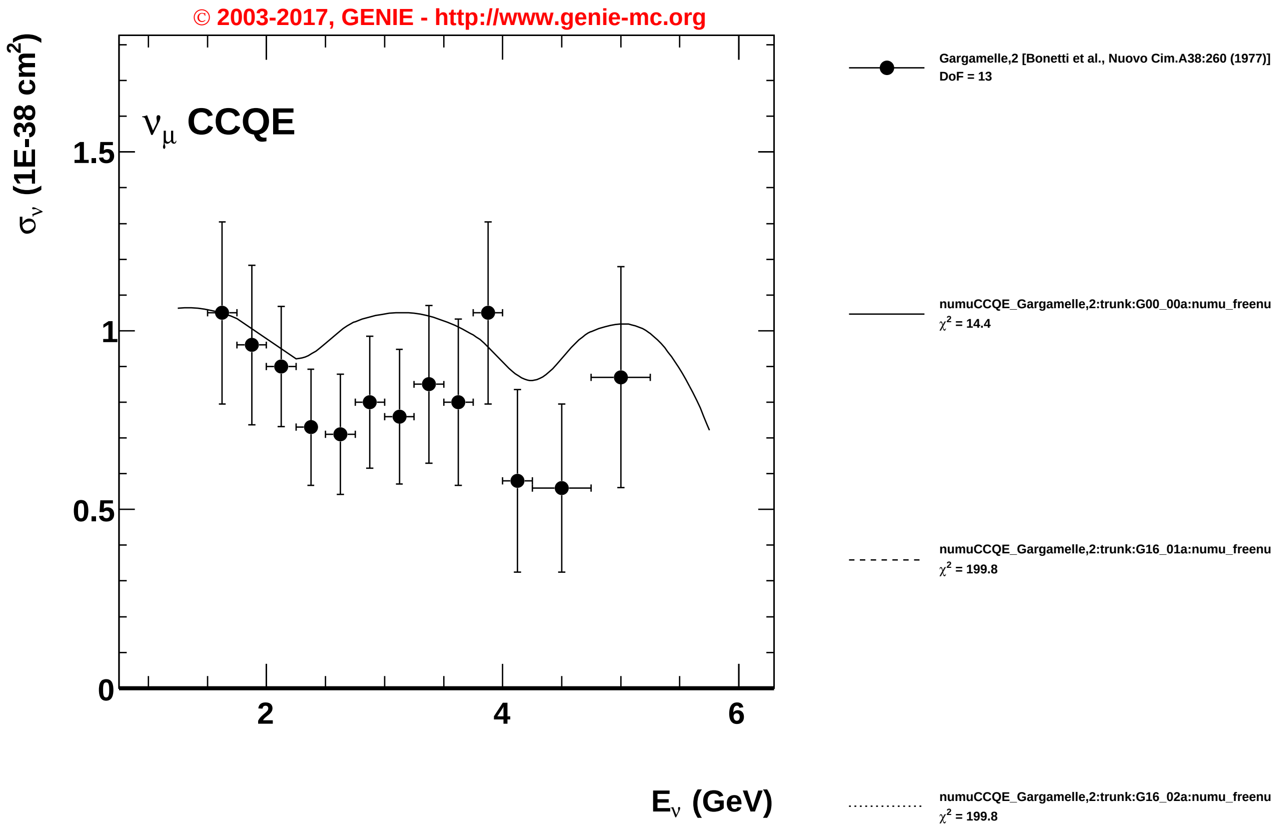
ν_μ CCQE
σ_ν (1E-38 cm^2)
0
0.5
1
10
20
30
E_ν (GeV)
BEBC,12 [Allasia et al., Nucl.Phys.B343:285 (1990)]
DoF = 4
numuCCQE_BEBC,12:trunk:G00_00a:numu_freenuc
χ^2 = 11.8
numuCCQE_BEBC,12:trunk:G16_01a:numu_freenuc
χ^2 = 109.5
numuCCQE_BEBC,12:trunk:G16_02a:numu_freenuc
χ^2 = 109.5

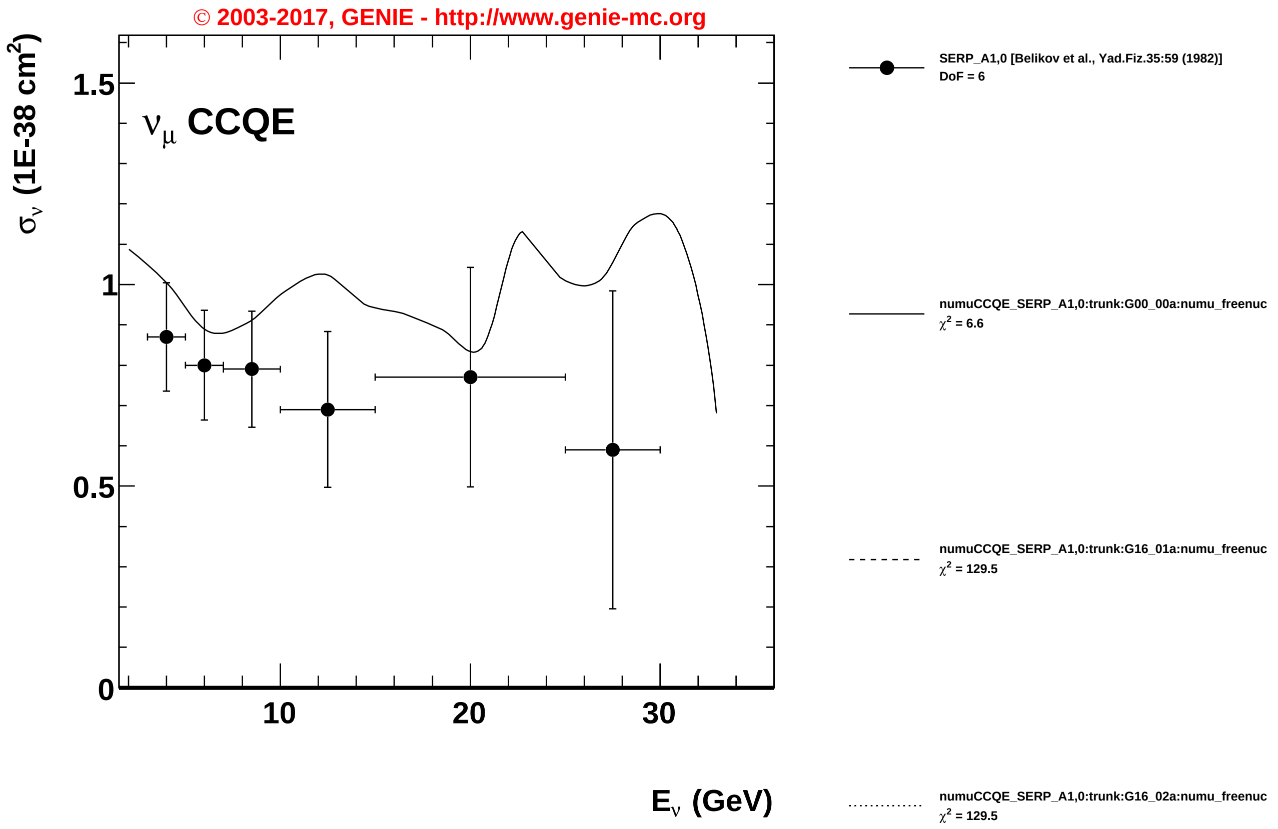


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CCQE
σ_ν (1E-38 cm^2)
1.5
1
0.5
0
0.5
1
1.5
2
2.5
E_ν (GeV)
BNL_7FT,3 [Baker et al., Phys.Rev.D23:2499 (1981)]
DoF = 4
numuCCQE_BNL_7FT,3:trunk:G00_00a:numu_freenuc
χ^2 = 1.3
numuCCQE_BNL_7FT,3:trunk:G16_01a:numu_freenuc
χ^2 = 133.0
numuCCQE_BNL_7FT,3:trunk:G16_02a:numu_freenuc
χ^2 = 133.0

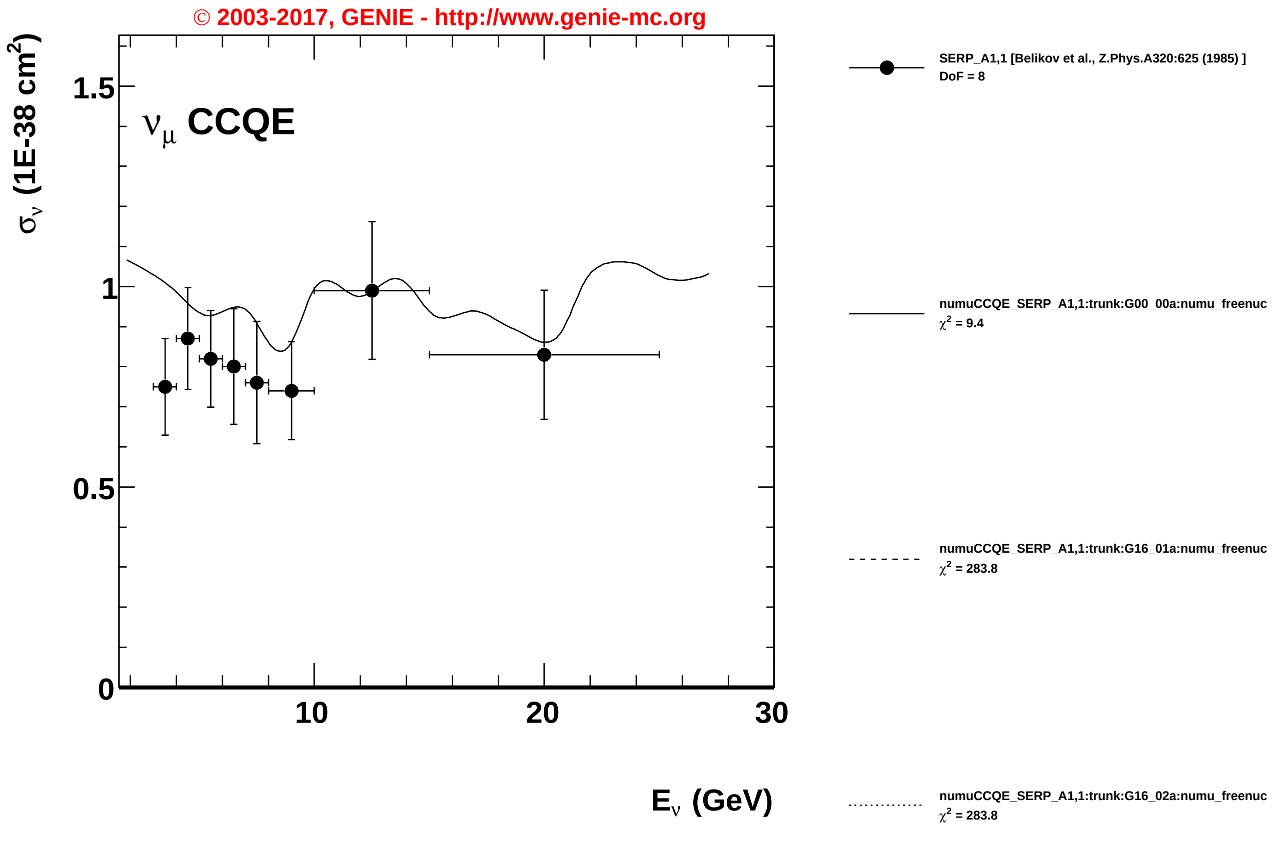

© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
6
8
10
12
14
FNAL_15FT,3 [Kitagaki et al., Phys.Rev.D28:436 (1983)]
DoF = 1
numuCCQE_FNAL_15FT,3:trunk:G00_00a:numu_freenu
χ^2 = 0.0
numuCCQE_FNAL_15FT,3:trunk:G16_01a:numu_freenu
χ^2 = 13.1
numuCCQE_FNAL_15FT,3:trunk:G16_02a:numu_freenu
χ^2 = 13.1

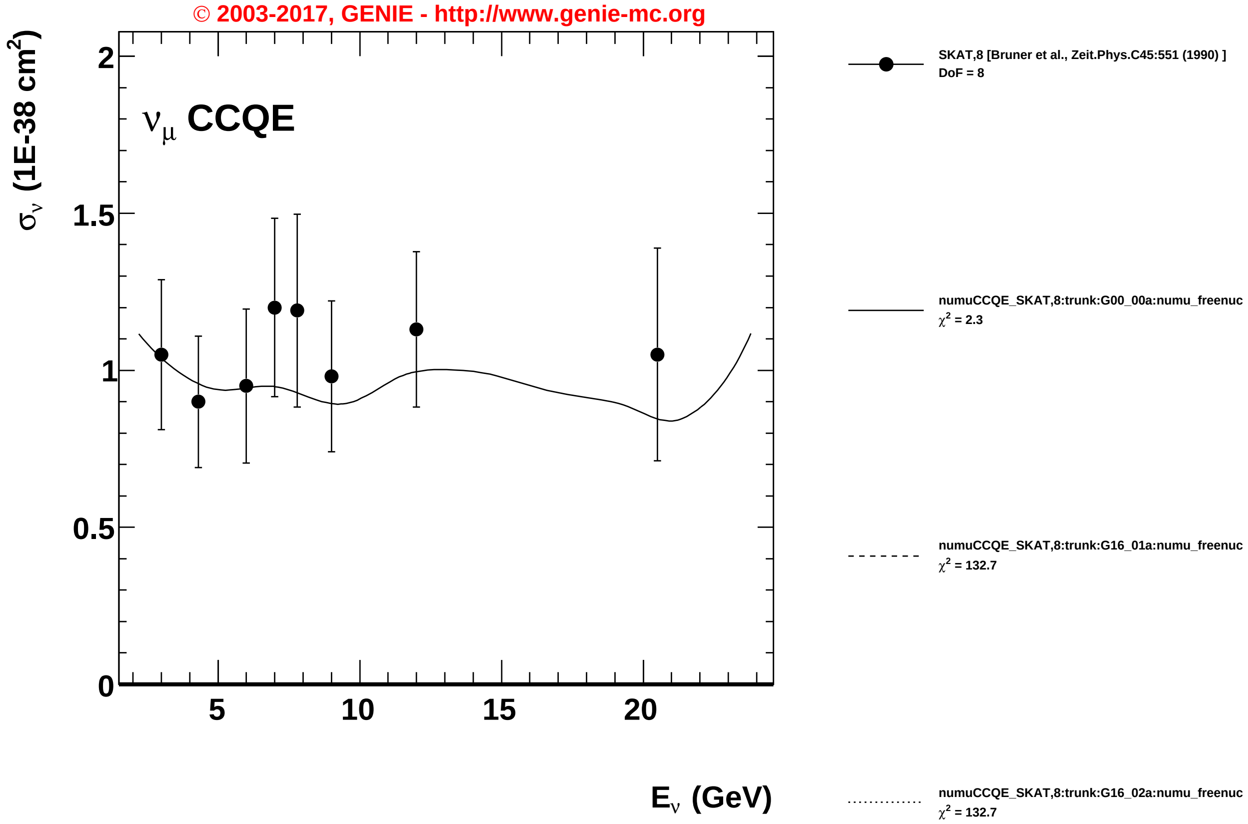


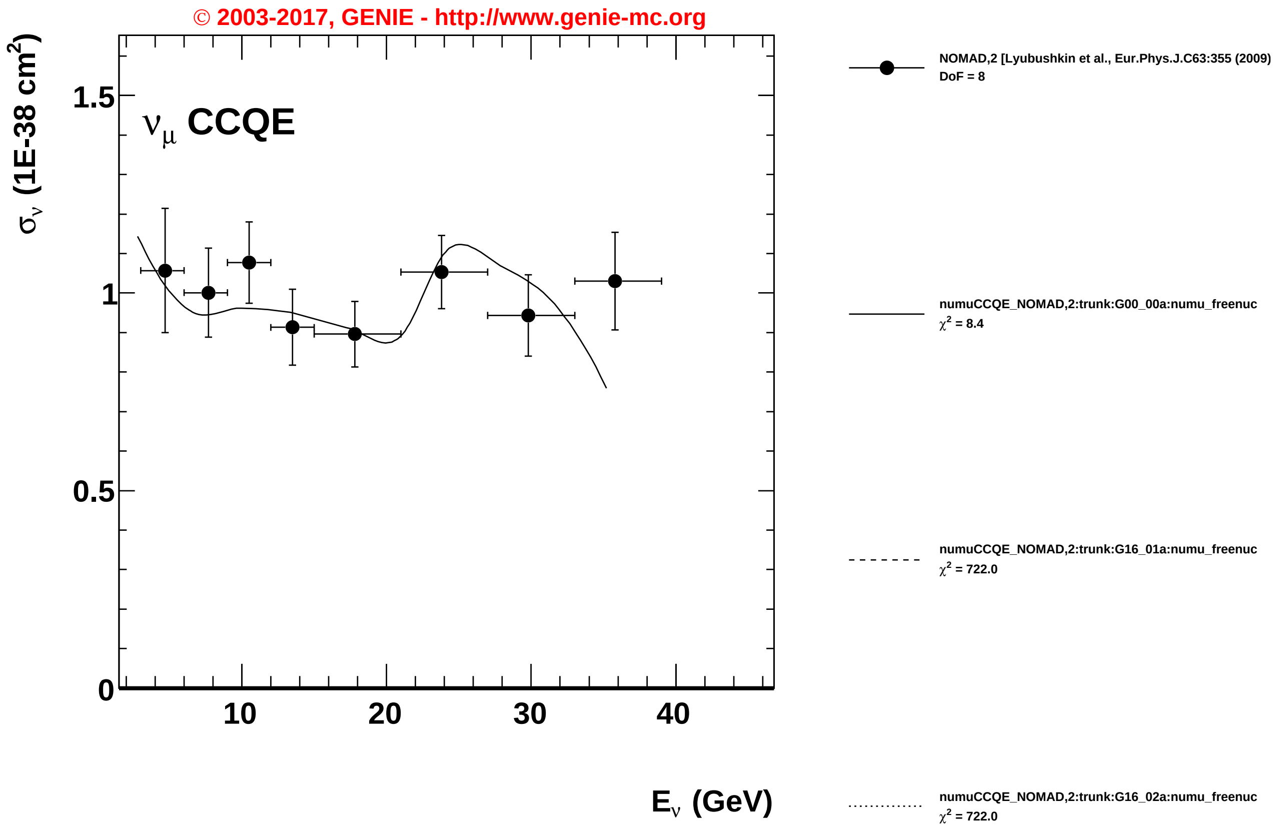
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
4
6
Gargamelle,2 [Bonetti et al., Nuovo Cim.A38:260 (1977)]
DoF = 13
numuCCQE_Gargamelle,2:trunk:G00_00a:numu_freenu
χ^2 = 14.4
numuCCQE_Gargamelle,2:trunk:G16_01a:numu_freenu
χ^2 = 199.8
numuCCQE_Gargamelle,2:trunk:G16_02a:numu_freenu
χ^2 = 199.8

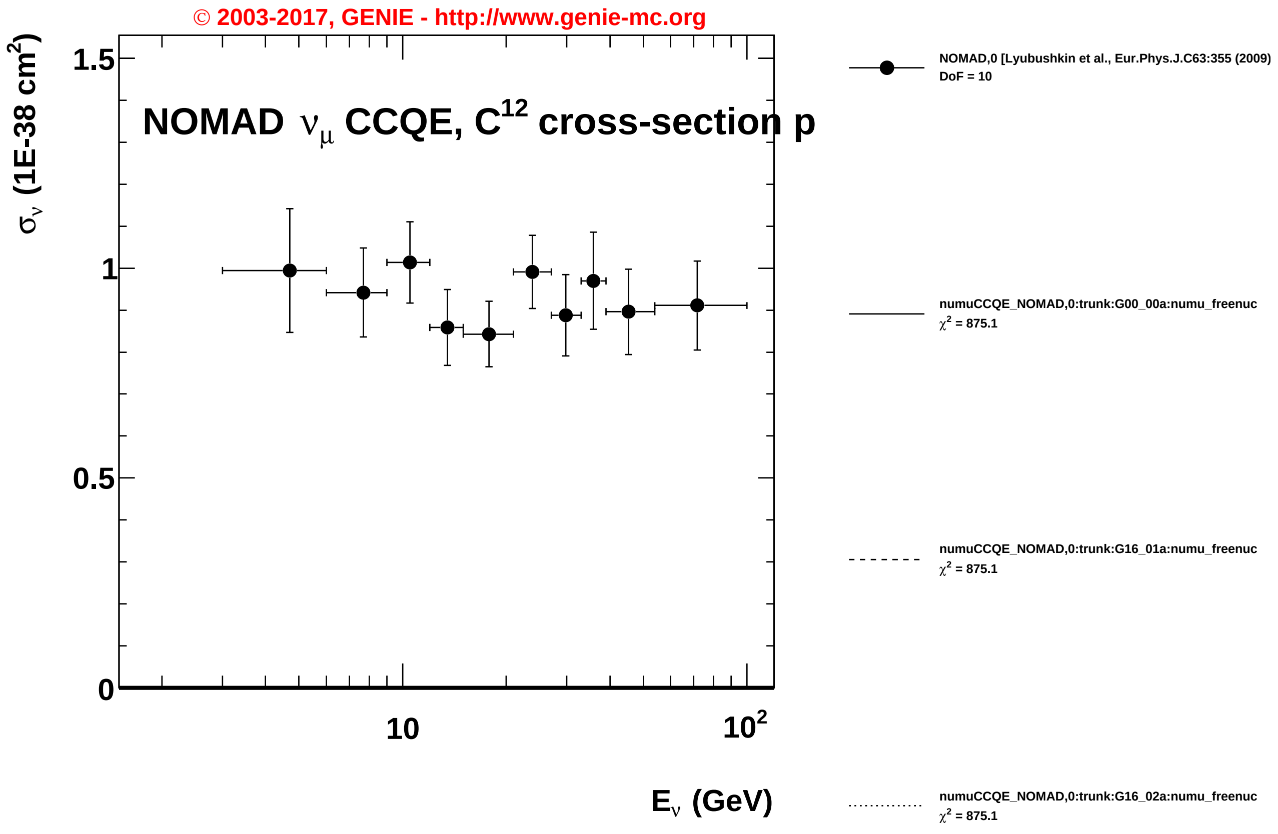


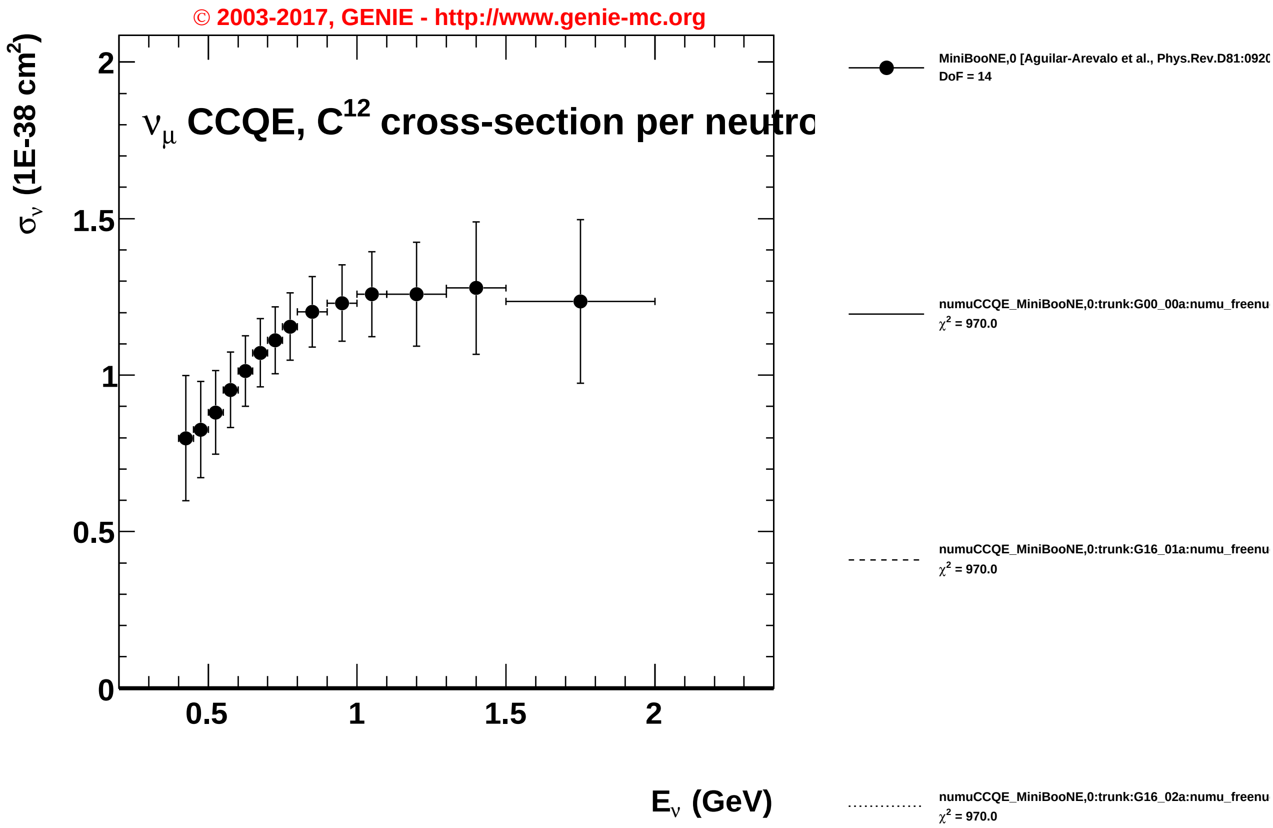
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
10
20
30
SERP_A1,0 [Belikov et al., Yad.Fiz.35:59 (1982)]
DoF = 6
numuCCQE_SERP_A1,0:trunk:G00_00a:numu_freenuc
χ^2 = 6.6
numuCCQE_SERP_A1,0:trunk:G16_01a:numu_freenuc
χ^2 = 129.5
numuCCQE_SERP_A1,0:trunk:G16_02a:numu_freenuc
χ^2 = 129.5


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
10
20
30
SERP_A1,1 [Belikov et al., Z.Phys.A320:625 (1985)]
DoF = 8
numuCCQE_SERP_A1,1:trunk:G00_00a:numu_freenuc
χ^2 = 9.4
numuCCQE_SERP_A1,1:trunk:G16_01a:numu_freenuc
χ^2 = 283.8
numuCCQE_SERP_A1,1:trunk:G16_02a:numu_freenuc
χ^2 = 283.8


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
5
10
15
20
SKAT,8 [Bruner et al., Zeit.Phys.C45:551 (1990)]
DoF = 8
numuCCQE_SKAT,8:trunk:G00_00a:numu_freenuc
χ^2 = 2.3
numuCCQE_SKAT,8:trunk:G16_01a:numu_freenuc
χ^2 = 132.7
numuCCQE_SKAT,8:trunk:G16_02a:numu_freenuc
χ^2 = 132.7


© 2003-2017, GENIE - http://www.genie-mc.org
σ_ν (1E-38 cm^2)
ν_μ CCQE
1.5
1
0.5
0
10
20
30
40
E_ν (GeV)
NOMAD,2 [Lyubushkin et al., Eur.Phys.J.C63:355 (2009)
DoF = 8
numuCCQE_NOMAD,2:trunk:G00_00a:numu_freenuc
χ^2 = 8.4
numuCCQE_NOMAD,2:trunk:G16_01a:numu_freenuc
χ^2 = 722.0
numuCCQE_NOMAD,2:trunk:G16_02a:numu_freenuc
χ^2 = 722.0


© 2003-2017, GENIE - http://www.genie-mc.org
NOMAD ν_μ CCQE, C^12 cross-section p
σ_ν (1E-38 cm^2)
1.5
1
0.5
0
10
10^2
E_ν (GeV)
NOMAD,0 [Lyubushkin et al., Eur.Phys.J.C63:355 (2009)
DoF = 10
numuCCQE_NOMAD,0:trunk:G00_00a:numu_freenuc
χ^2 = 875.1
numuCCQE_NOMAD,0:trunk:G16_01a:numu_freenuc
χ^2 = 875.1
numuCCQE_NOMAD,0:trunk:G16_02a:numu_freenuc
χ^2 = 875.1



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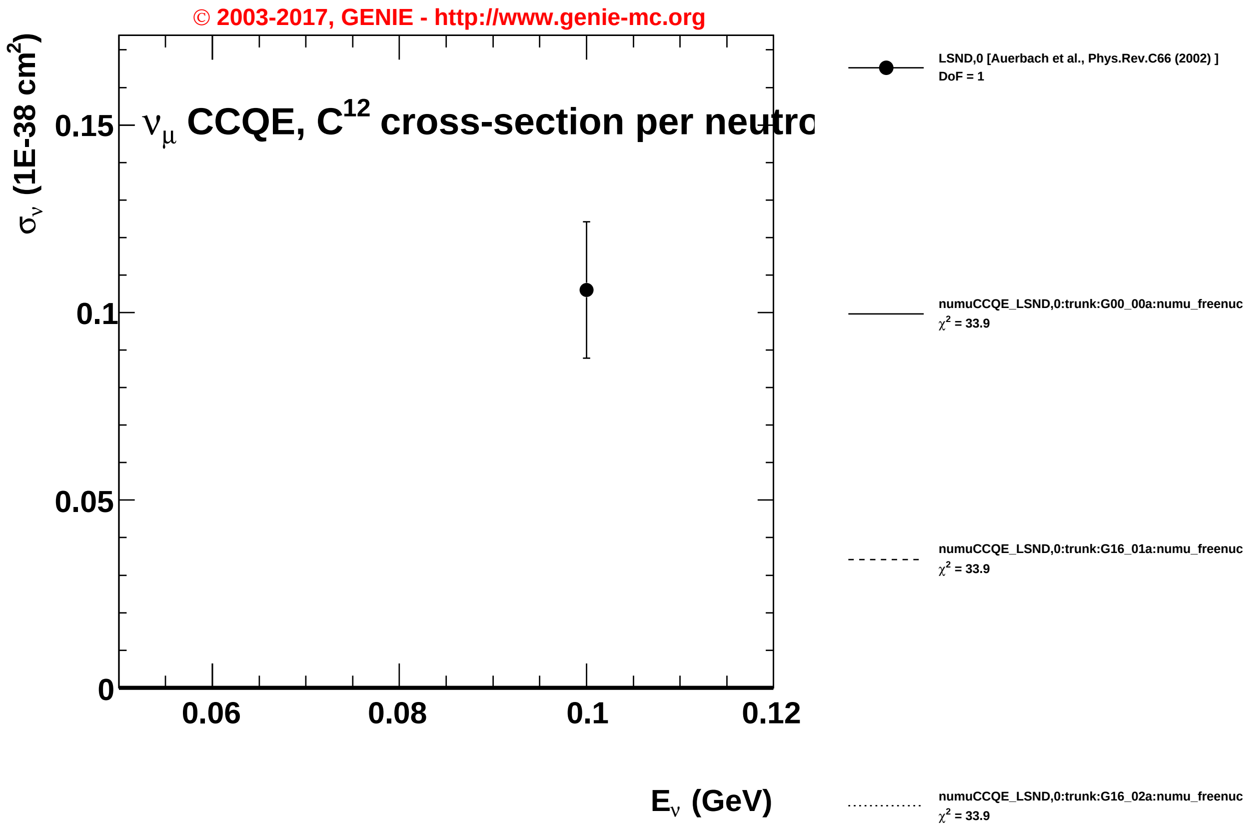
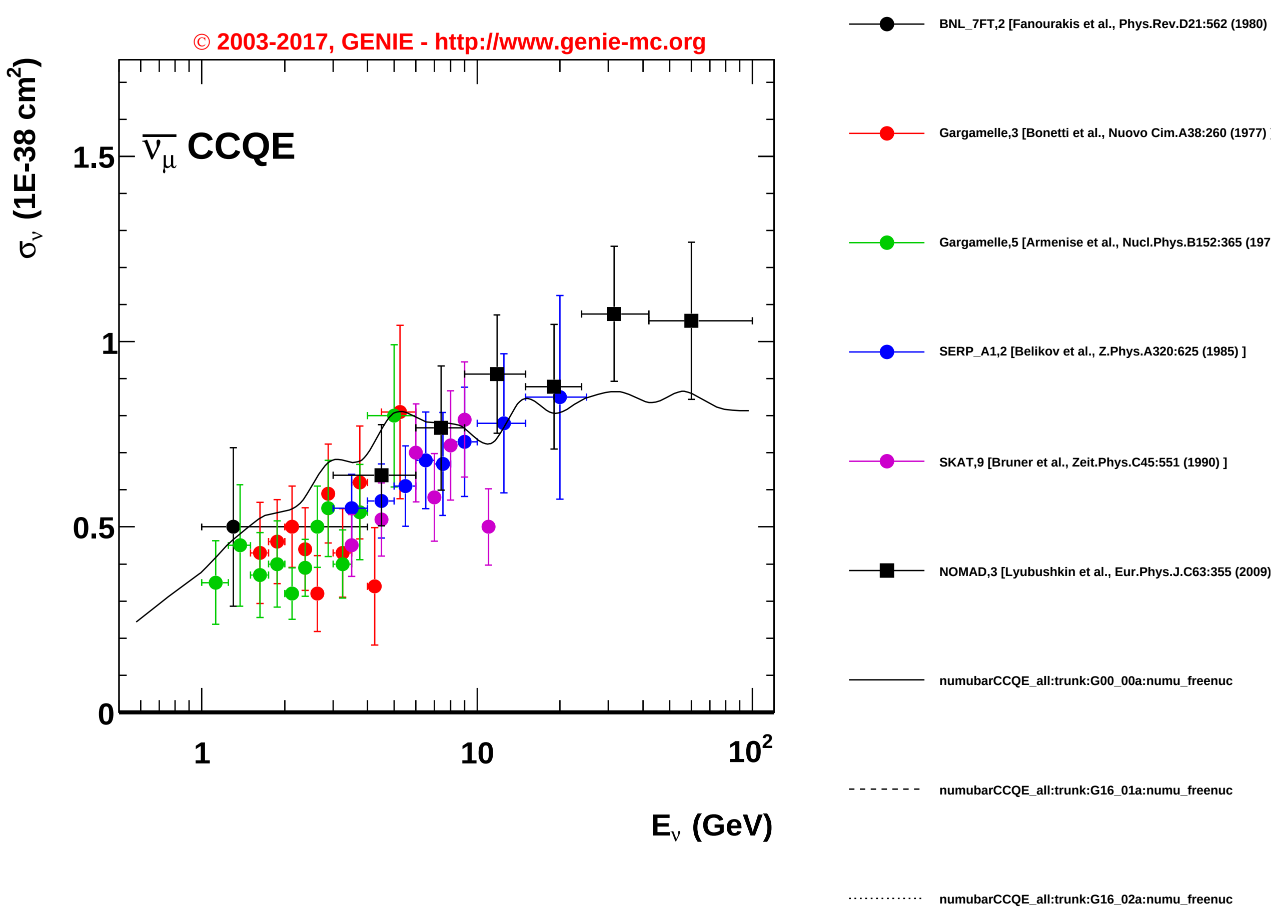
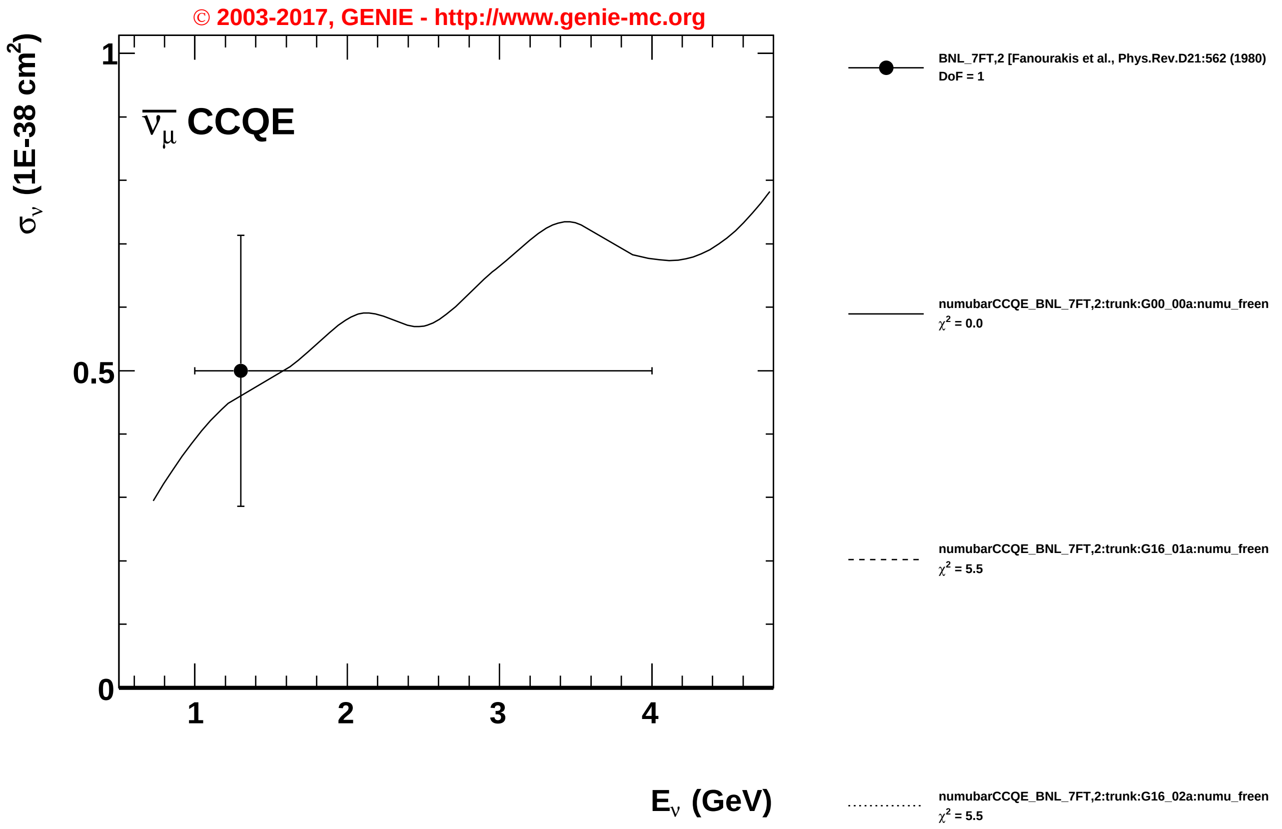
ν_μ CCQE, C^{12} cross-section per neutro
σ_ν (1E-38 cm^2)
2
1.5
1
0.5
0
0.5
1
1.5
2
E_ν (GeV)
MiniBooNE,0 [Aguilar-Arevalo et al., Phys.Rev.D81:0920
DoF = 14
numuCCQE_MiniBooNE,0:trunk:G00_00a:numu_freenu
χ^2 = 970.0
numuCCQE_MiniBooNE,0:trunk:G16_01a:numu_freenu
χ^2 = 970.0
numuCCQE_MiniBooNE,0:trunk:G16_02a:numu_freenu
χ^2 = 970.0


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CCQE, C^{12} cross-section per neutro
σ_ν (1E-38 cm^2)
0.15
0.1
0.05
0
0.06
0.08
0.1
0.12
E_ν (GeV)
LSND,0 [Auerbach et al., Phys.Rev.C66 (2002)]
DoF = 1
numuCCQE_LSND,0:trunk:G00_00a:numu_freenuc
χ^2 = 33.9
numuCCQE_LSND,0:trunk:G16_01a:numu_freenuc
χ^2 = 33.9
numuCCQE_LSND,0:trunk:G16_02a:numu_freenuc
χ^2 = 33.9


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
1
10
10^2
BNL_7FT,2 [Fanourakis et al., Phys.Rev.D21:562 (1980)
Gargamelle,3 [Bonetti et al., Nuovo Cim.A38:260 (1977)
Gargamelle,5 [Armenise et al., Nucl.Phys.B152:365 (197
SERP_A1,2 [Belikov et al., Z.Phys.A320:625 (1985)]
SKAT,9 [Bruner et al., Zeit.Phys.C45:551 (1990)]
NOMAD,3 [Lyubushkin et al., Eur.Phys.J.C63:355 (2009)
numubarCCQE_all:trunk:G00_00a:numu_freenuc
numubarCCQE_all:trunk:G16_01a:numu_freenuc
numubarCCQE_all:trunk:G16_02a:numu_freenuc



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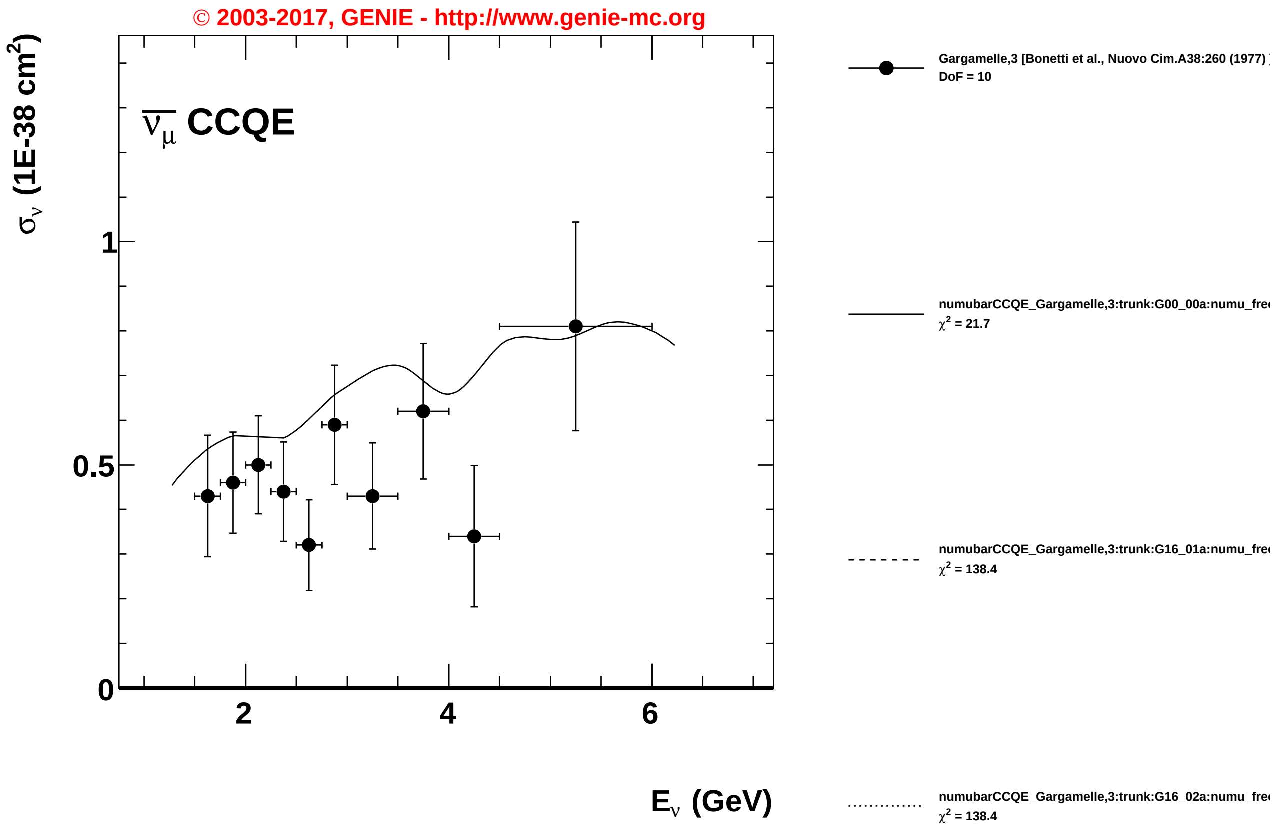
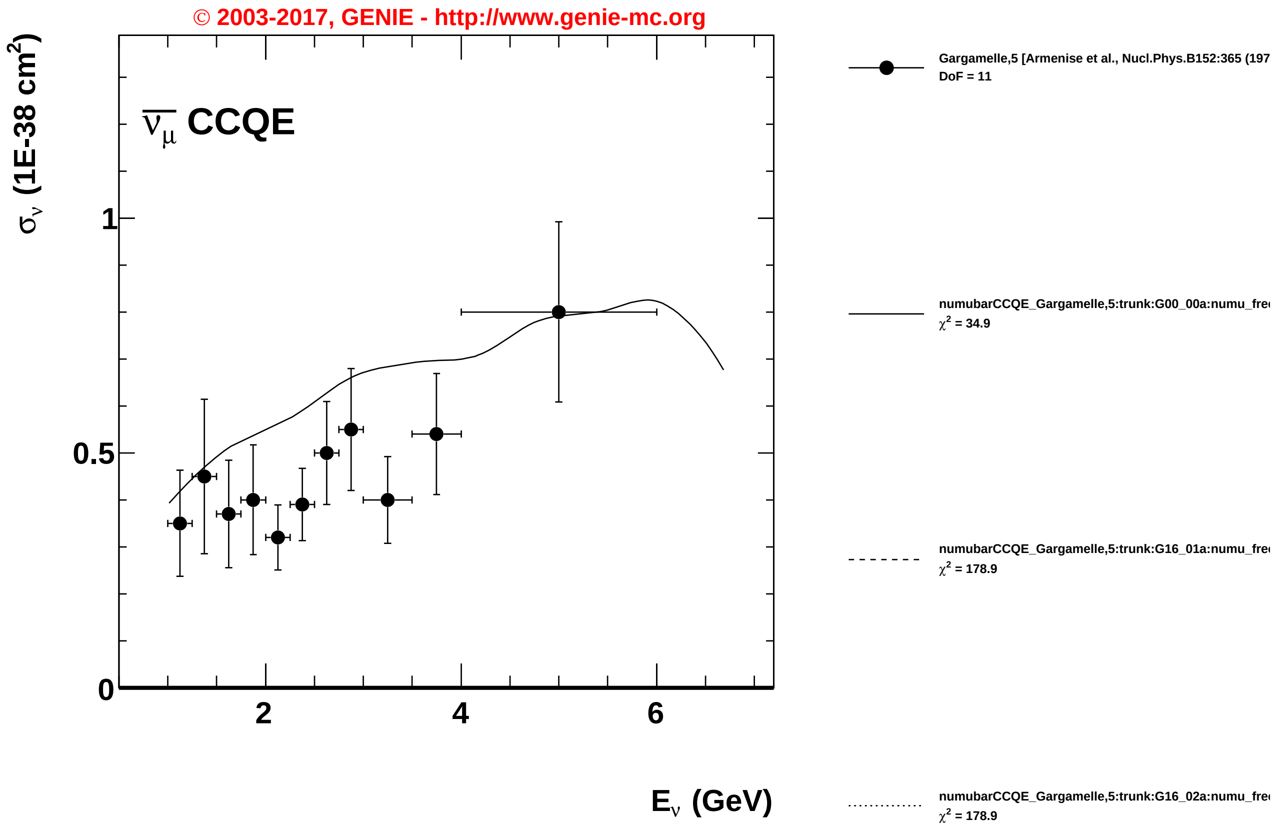
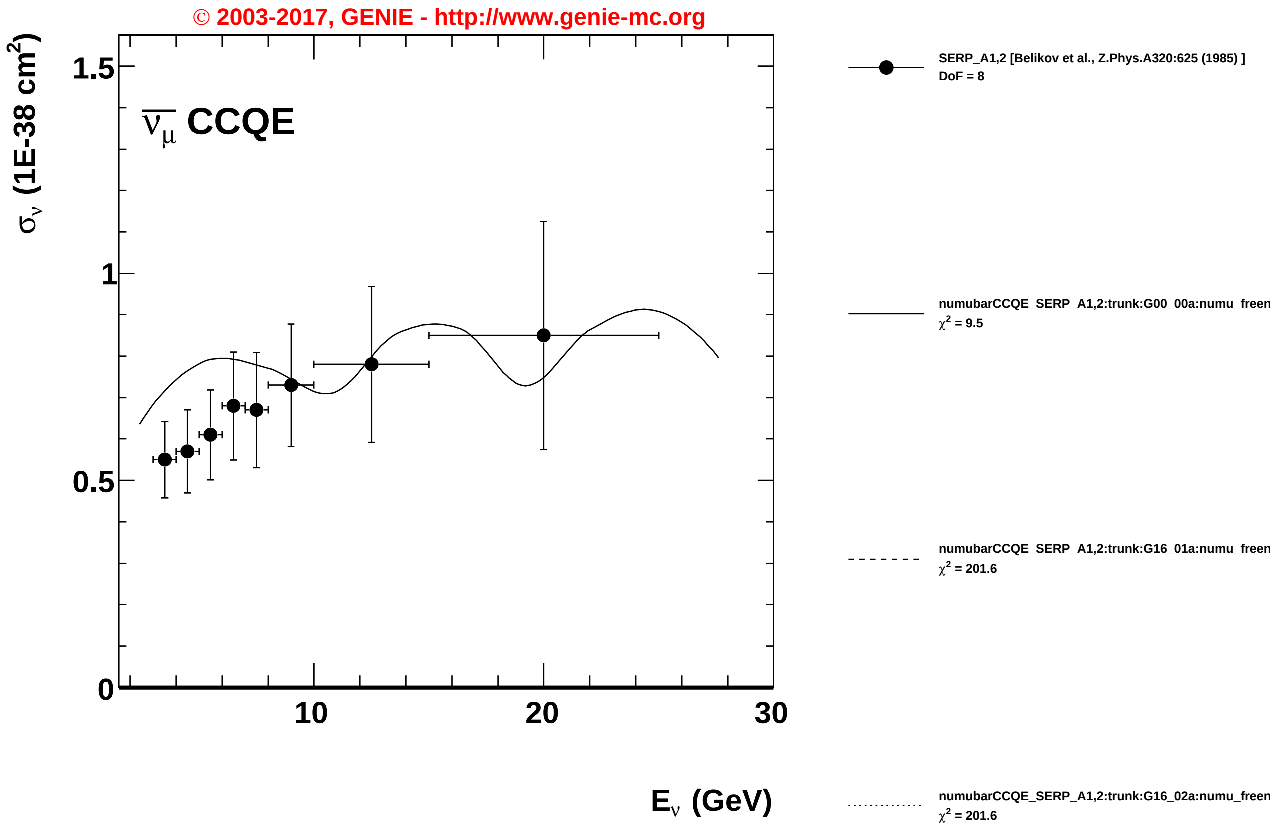
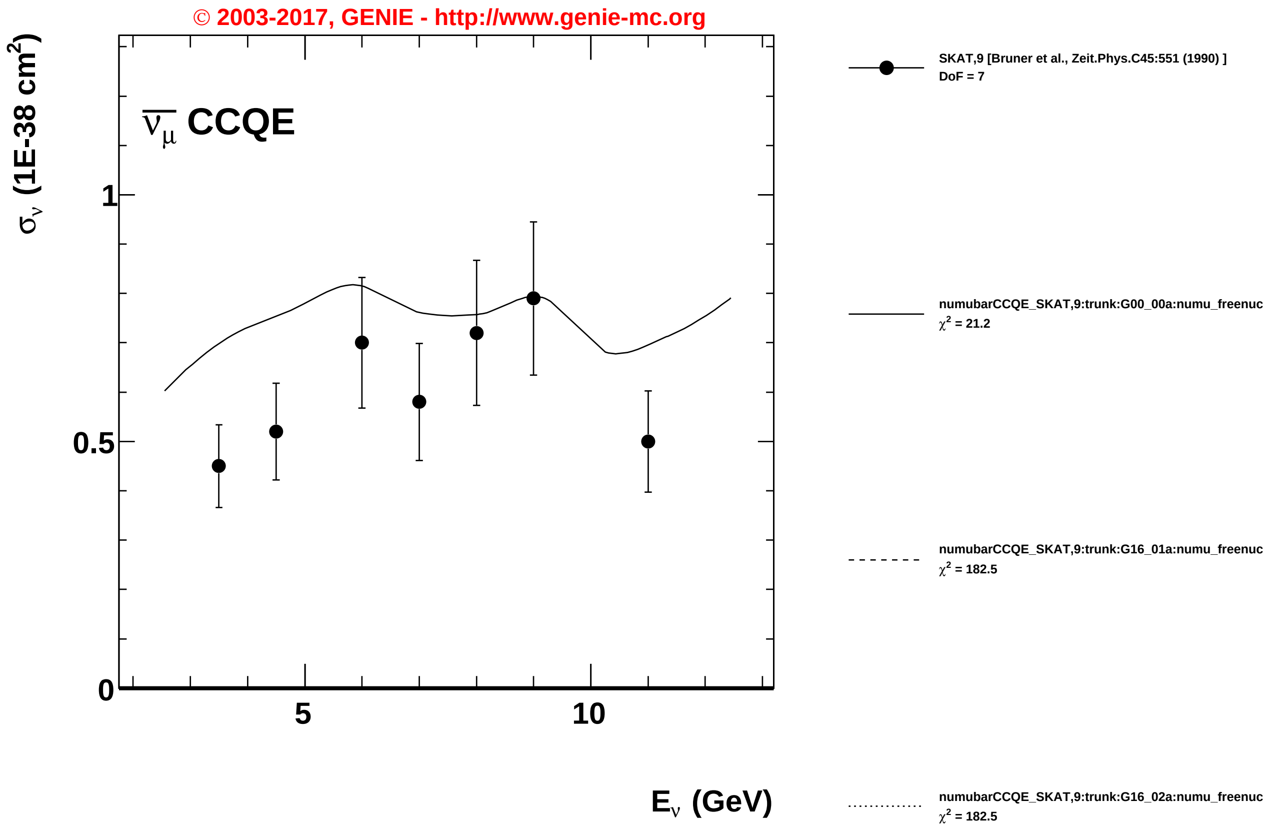
σ_ν (1E-38 cm^2)
$\overline{\nu_\mu}$ CCQE
1
0.5
0
1
2
3
4
E_ν (GeV)
BNL_7FT,2 [Fanourakis et al., Phys.Rev.D21:562 (1980)
DoF = 1
numubarCCQE_BNL_7FT,2:trunk:G00_00a:numu_freen
χ^2 = 0.0
numubarCCQE_BNL_7FT,2:trunk:G16_01a:numu_freen
χ^2 = 5.5
numubarCCQE_BNL_7FT,2:trunk:G16_02a:numu_freen
χ^2 = 5.5


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
2
4
6
Gargamelle,3 [Bonetti et al., Nuovo Cim.A38:260 (1977)
DoF = 10
numubarCCQE_Gargamelle,3:trunk:G00_00a:numu_fre
χ^2 = 21.7
numubarCCQE_Gargamelle,3:trunk:G16_01a:numu_fre
χ^2 = 138.4
numubarCCQE_Gargamelle,3:trunk:G16_02a:numu_fre
χ^2 = 138.4


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
2
4
6
Gargamelle,5 [Armenise et al., Nucl.Phys.B152:365 (197
DoF = 11
numubarCCQE_Gargamelle,5:trunk:G00_00a:numu_fre
χ^2 = 34.9
numubarCCQE_Gargamelle,5:trunk:G16_01a:numu_fre
χ^2 = 178.9
numubarCCQE_Gargamelle,5:trunk:G16_02a:numu_fre
χ^2 = 178.9


© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
10
20
30
SERP_A1,2 [Belikov et al., Z.Phys.A320:625 (1985)]
DoF = 8
numubarCCQE_SERP_A1,2:trunk:G00_00a:numu_freen
χ^2 = 9.5
numubarCCQE_SERP_A1,2:trunk:G16_01a:numu_freen
χ^2 = 201.6
numubarCCQE_SERP_A1,2:trunk:G16_02a:numu_freen
χ^2 = 201.6



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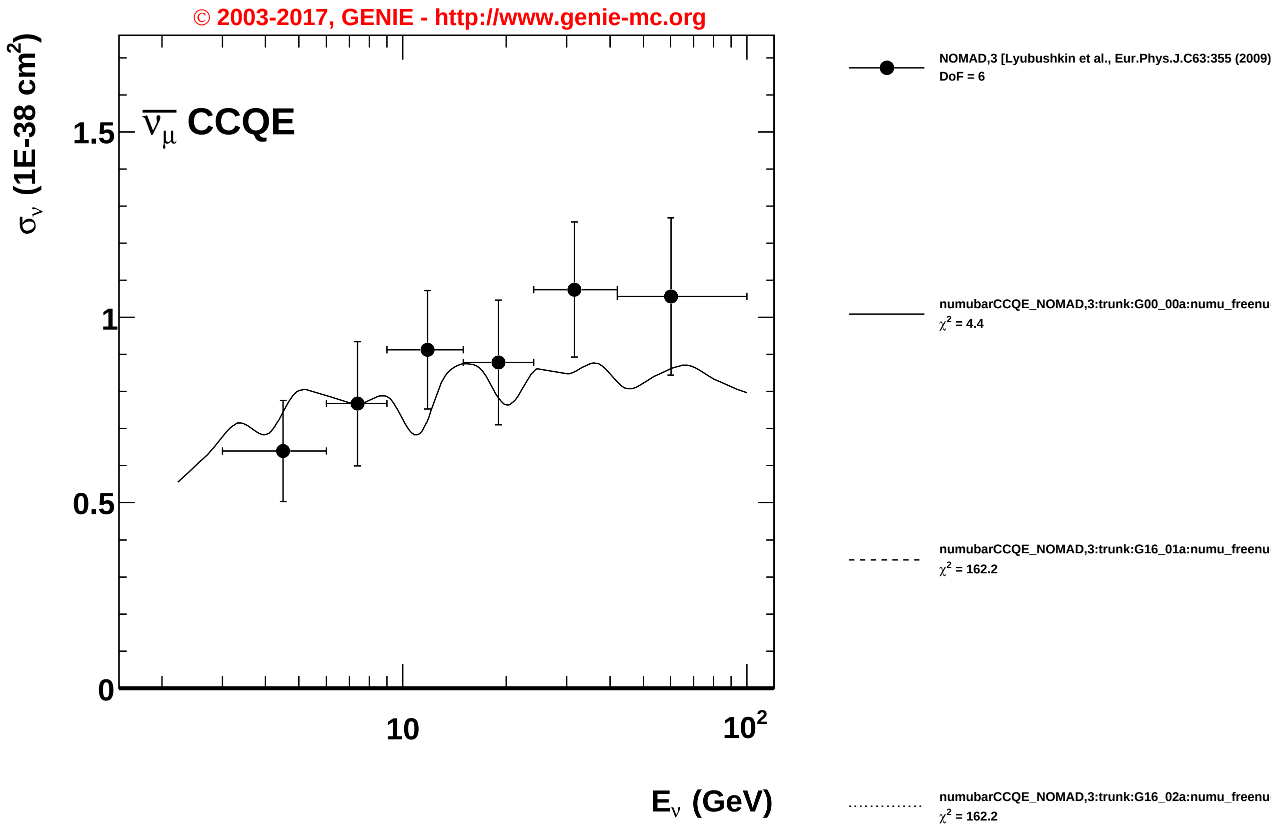
$\overline{\nu_\mu}$ CCQE
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
5
10
SKAT,9 [Bruner et al., Zeit.Phys.C45:551 (1990)]
DoF = 7
numubarCCQE_SKAT,9:trunk:G00_00a:numu_freenuc
χ^2 = 21.2
numubarCCQE_SKAT,9:trunk:G16_01a:numu_freenuc
χ^2 = 182.5
numubarCCQE_SKAT,9:trunk:G16_02a:numu_freenuc
χ^2 = 182.5



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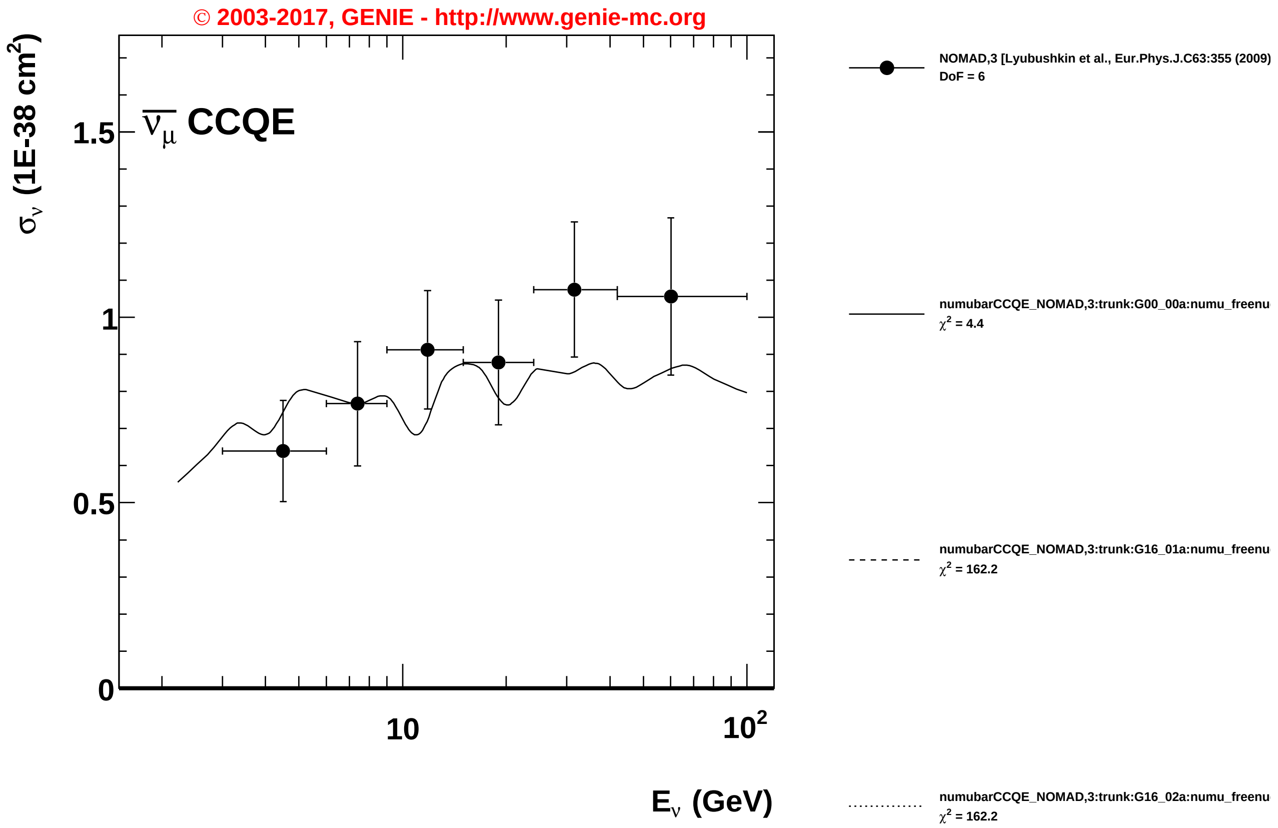
$\overline{\nu_\mu}$ CCQE
σ_ν (1E-38 cm^2)
1.5
1
0.5
0
10
10^2
E_ν (GeV)
NOMAD,3 [Lyubushkin et al., Eur.Phys.J.C63:355 (2009)
DoF = 6
numubarCCQE_NOMAD,3:trunk:G00_00a:numu_freenu
χ^2 = 4.4
numubarCCQE_NOMAD,3:trunk:G16_01a:numu_freenu
χ^2 = 162.2
numubarCCQE_NOMAD,3:trunk:G16_02a:numu_freenu
χ^2 = 162.2



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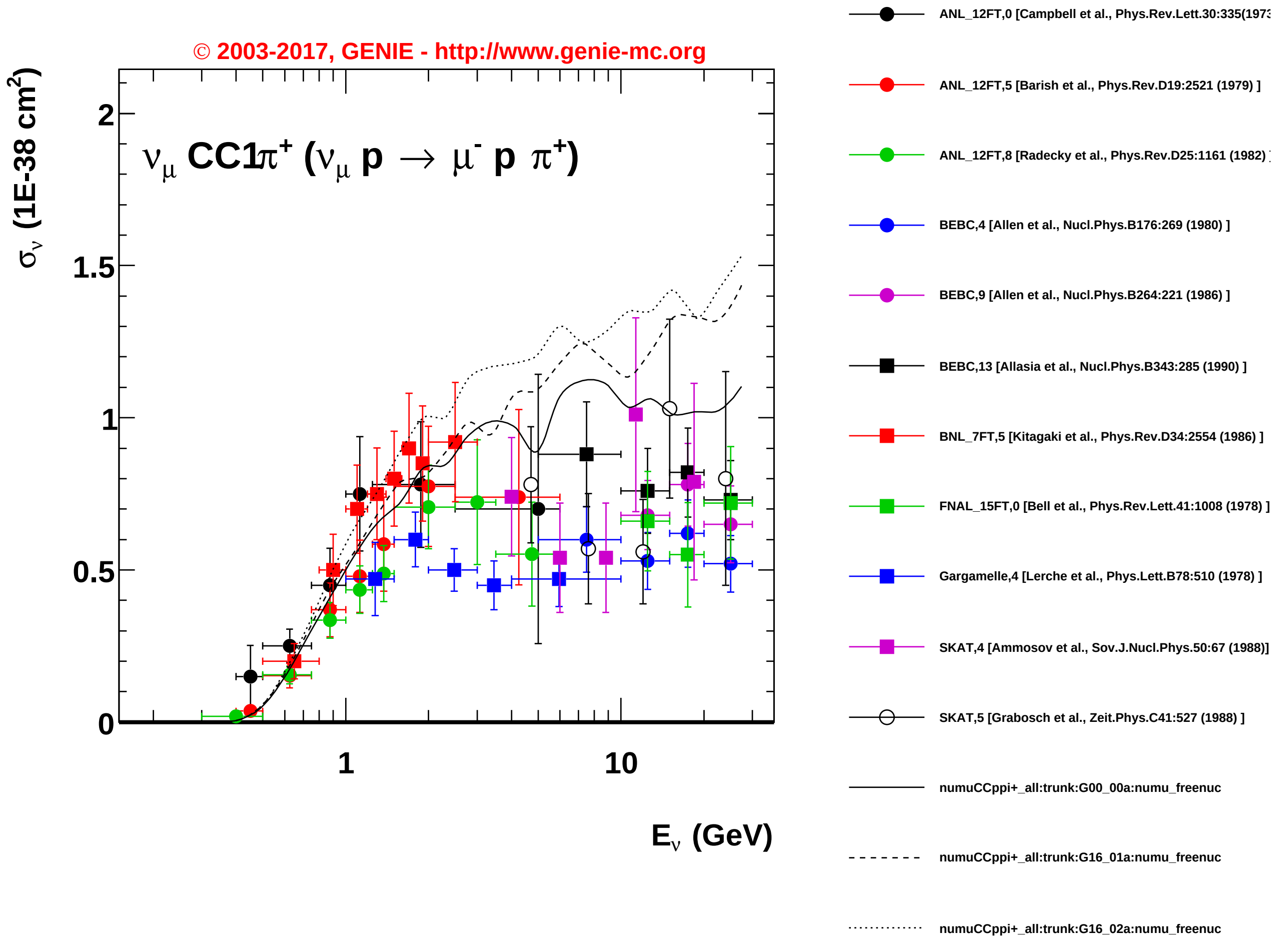
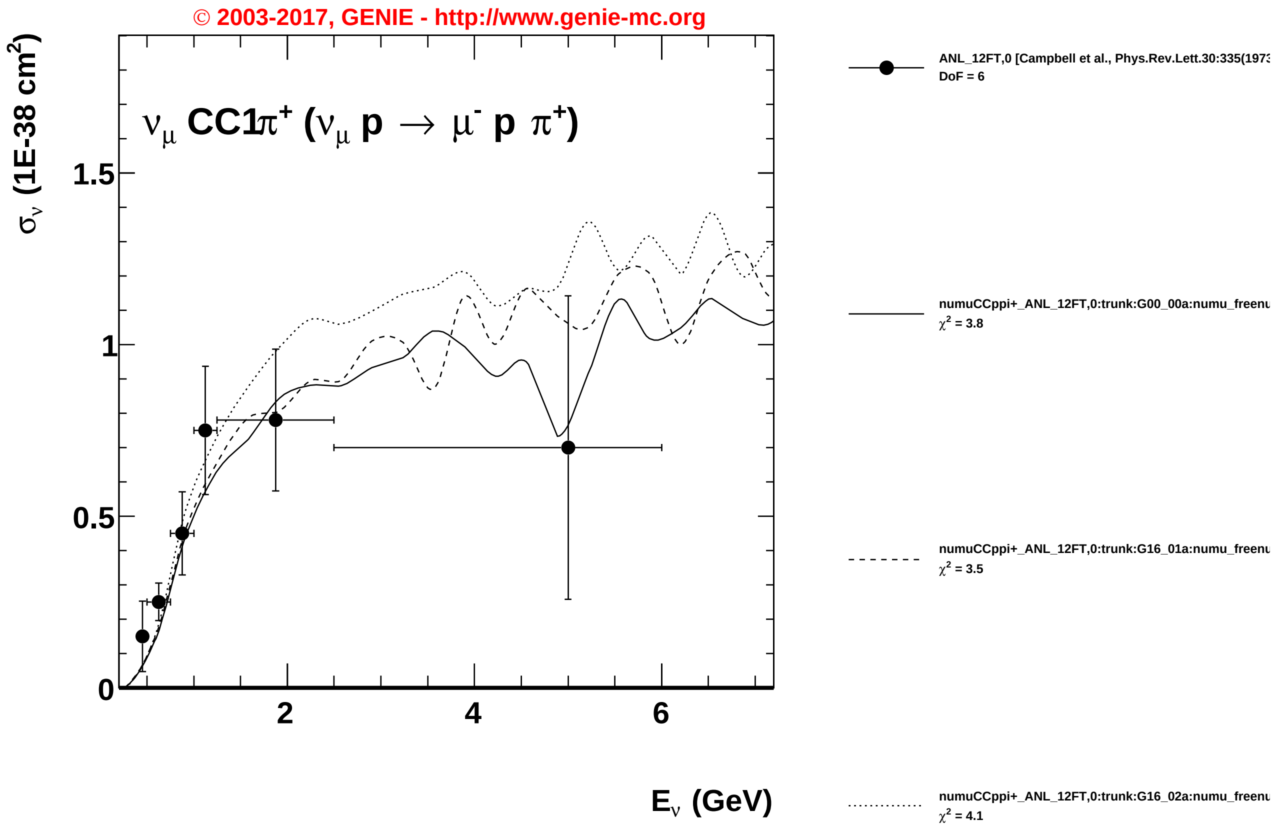
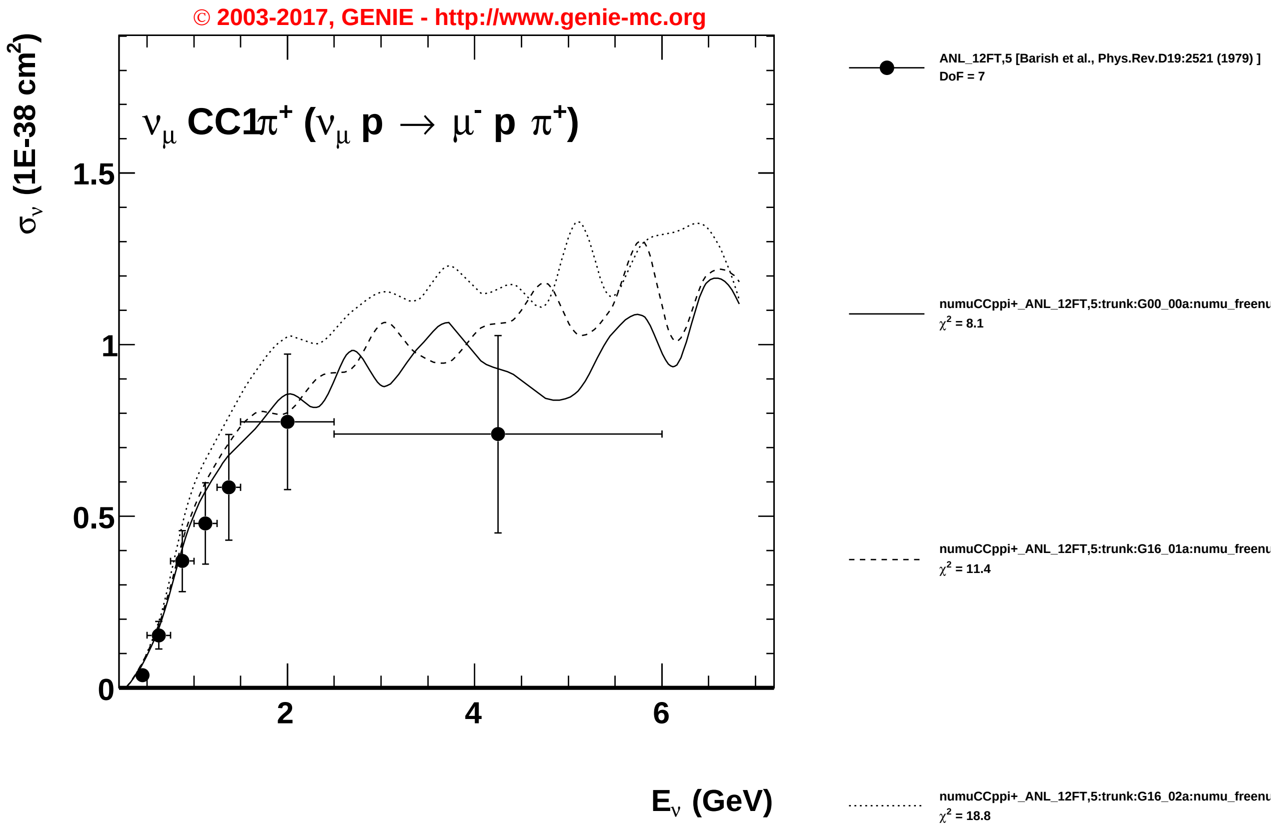
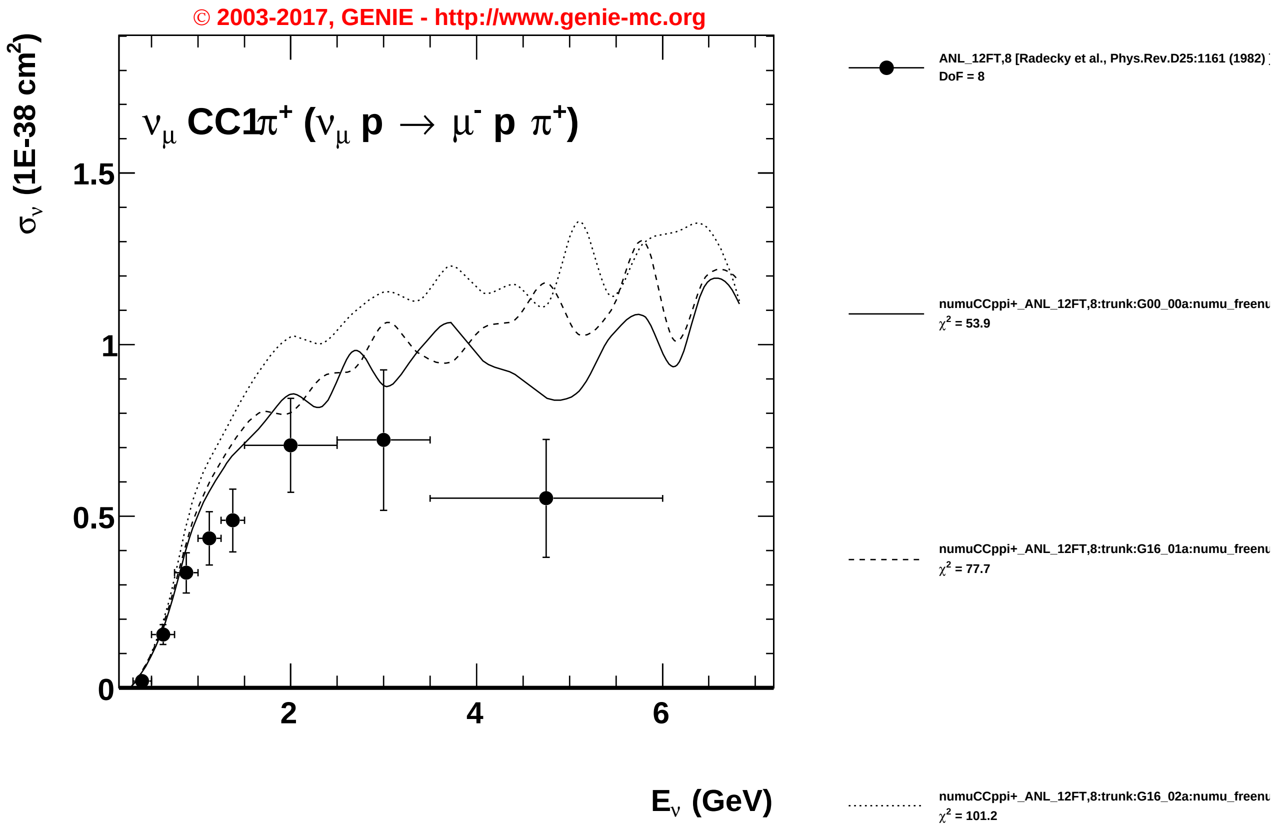
$\overline{\nu_\mu}$ CCQE
σ_ν (1E-38 cm^2)
1.5
1
0.5
0
10
10^2
E_ν (GeV)
NOMAD,3 [Lyubushkin et al., Eur.Phys.J.C63:355 (2009)
DoF = 6
numubarCCQE_NOMAD,3:trunk:G00_00a:numu_freenu
χ^2 = 4.4
numubarCCQE_NOMAD,3:trunk:G16_01a:numu_freenu
χ^2 = 162.2
numubarCCQE_NOMAD,3:trunk:G16_02a:numu_freenu
χ^2 = 162.2


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
1
10
ANL_12FT,0 [Campbell et al., Phys.Rev.Lett.30:335(1973
ANL_12FT,5 [Barish et al., Phys.Rev.D19:2521 (1979)]
ANL_12FT,8 [Radecky et al., Phys.Rev.D25:1161 (1982)
BEBC,4 [Allen et al., Nucl.Phys.B176:269 (1980)]
BEBC,9 [Allen et al., Nucl.Phys.B264:221 (1986)]
BEBC,13 [Allasia et al., Nucl.Phys.B343:285 (1990)]
BNL_7FT,5 [Kitagaki et al., Phys.Rev.D34:2554 (1986)]
FNAL_15FT,0 [Bell et al., Phys.Rev.Lett.41:1008 (1978)]
Gargamelle,4 [Lerche et al., Phys.Lett.B78:510 (1978)]
SKAT,4 [Ammosov et al., Sov.J.Nucl.Phys.50:67 (1988)]
SKAT,5 [Grabosch et al., Zeit.Phys.C41:527 (1988)]
numuCCppi+_all:trunk:G00_00a:numu_freenuc
numuCCppi+_all:trunk:G16_01a:numu_freenuc
numuCCppi+_all:trunk:G16_02a:numu_freenuc


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
4
6
ANL_12FT,0 [Campbell et al., Phys.Rev.Lett.30:335(1973
DoF = 6
numuCCppi+_ANL_12FT,0:trunk:G00_00a:numu_freenu
χ^2 = 3.8
numuCCppi+_ANL_12FT,0:trunk:G16_01a:numu_freenu
χ^2 = 3.5
numuCCppi+_ANL_12FT,0:trunk:G16_02a:numu_freenu
χ^2 = 4.1


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
4
6
ANL_12FT,5 [Barish et al., Phys.Rev.D19:2521 (1979)]
DoF = 7
numuCCppi+_ANL_12FT,5:trunk:G00_00a:numu_freenu
χ^2 = 8.1
numuCCppi+_ANL_12FT,5:trunk:G16_01a:numu_freenu
χ^2 = 11.4
numuCCppi+_ANL_12FT,5:trunk:G16_02a:numu_freenu
χ^2 = 18.8



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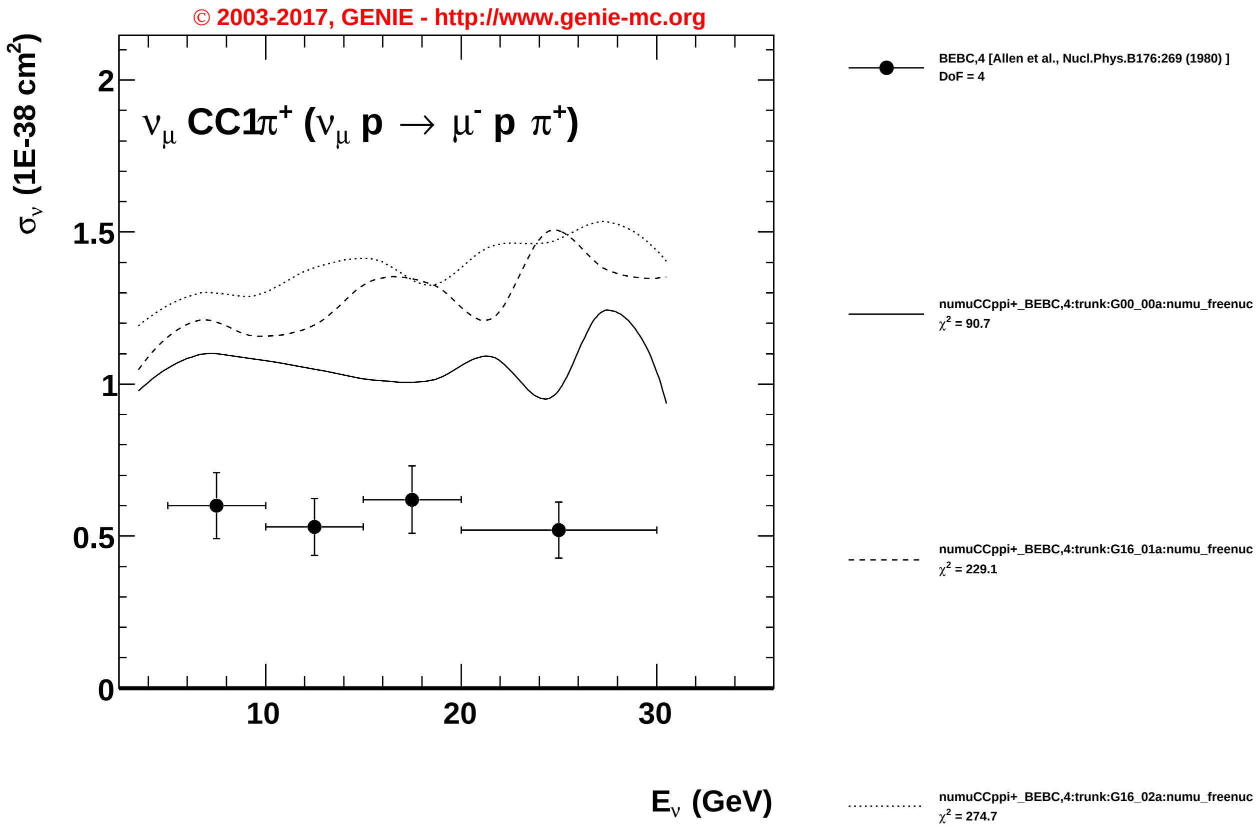
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
4
6
ANL_12FT,8 [Radecky et al., Phys.Rev.D25:1161 (1982)
DoF = 8
numuCCppi+_ANL_12FT,8:trunk:G00_00a:numu_freenu
χ^2 = 53.9
numuCCppi+_ANL_12FT,8:trunk:G16_01a:numu_freenu
χ^2 = 77.7
numuCCppi+_ANL_12FT,8:trunk:G16_02a:numu_freenu
χ^2 = 101.2



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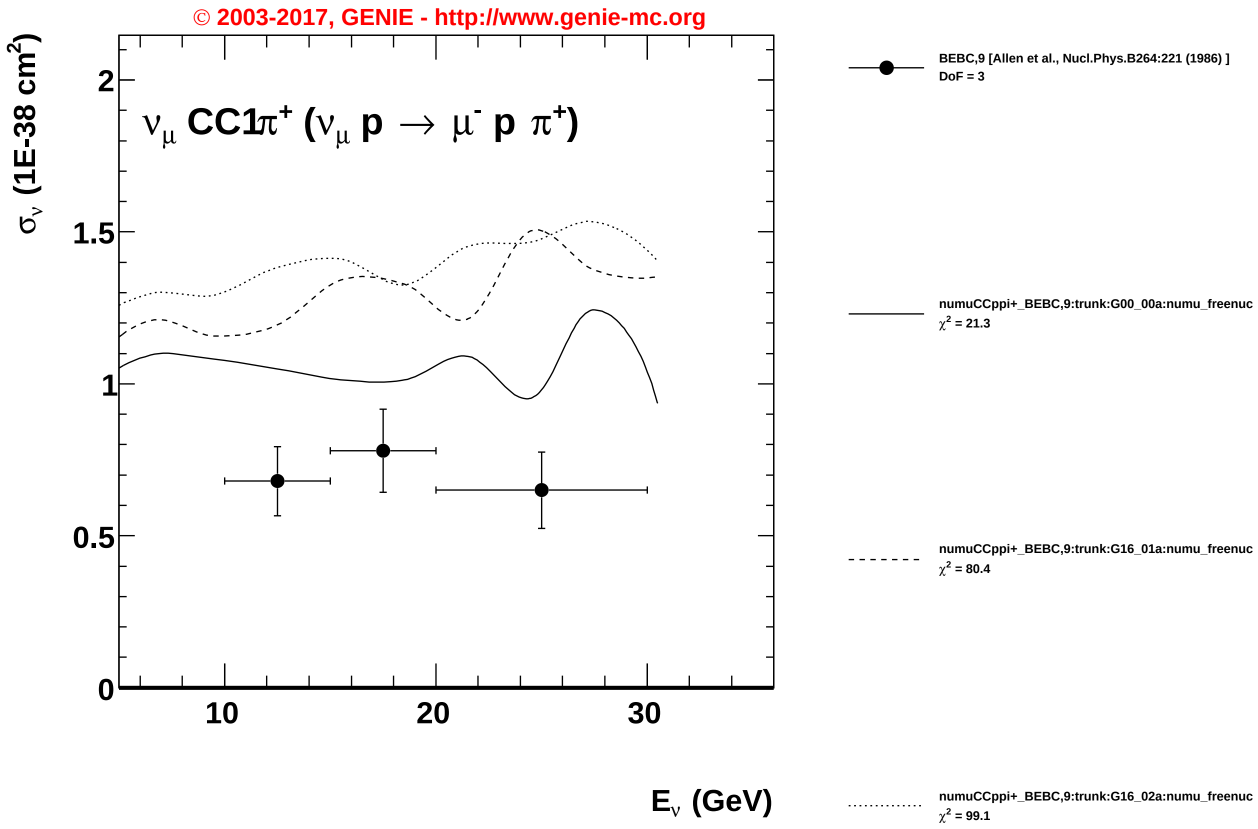
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
10
20
30
BEBC,4 [Allen et al., Nucl.Phys.B176:269 (1980)]
DoF = 4
numuCCppi+_BEBC,4:trunk:G00_00a:numu_freenuc
χ^2 = 90.7
numuCCppi+_BEBC,4:trunk:G16_01a:numu_freenuc
χ^2 = 229.1
numuCCppi+_BEBC,4:trunk:G16_02a:numu_freenuc
χ^2 = 274.7



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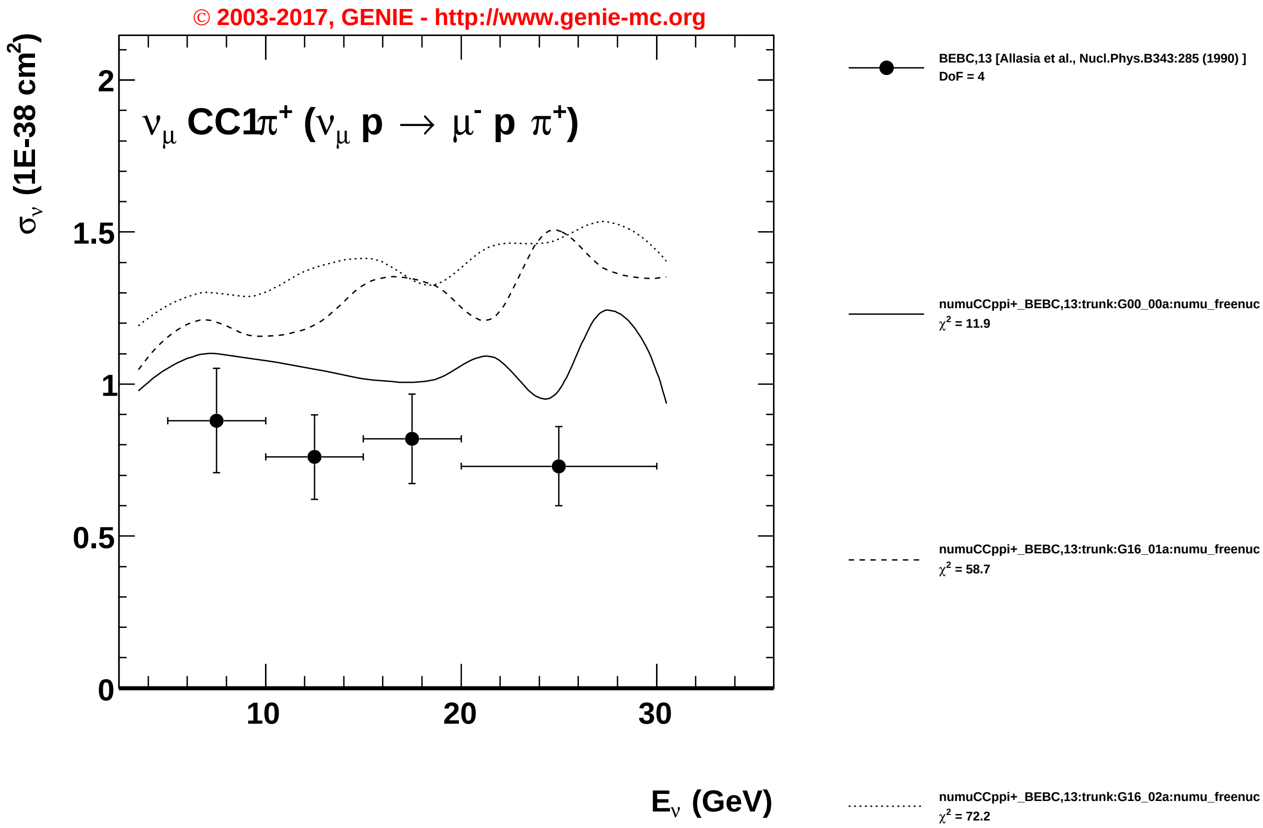
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
10
20
30
BEBC,9 [Allen et al., Nucl.Phys.B264:221 (1986)]
DoF = 3
numuCCppi+_BEBC,9:trunk:G00_00a:numu_freenuc
χ^2 = 21.3
numuCCppi+_BEBC,9:trunk:G16_01a:numu_freenuc
χ^2 = 80.4
numuCCppi+_BEBC,9:trunk:G16_02a:numu_freenuc
χ^2 = 99.1



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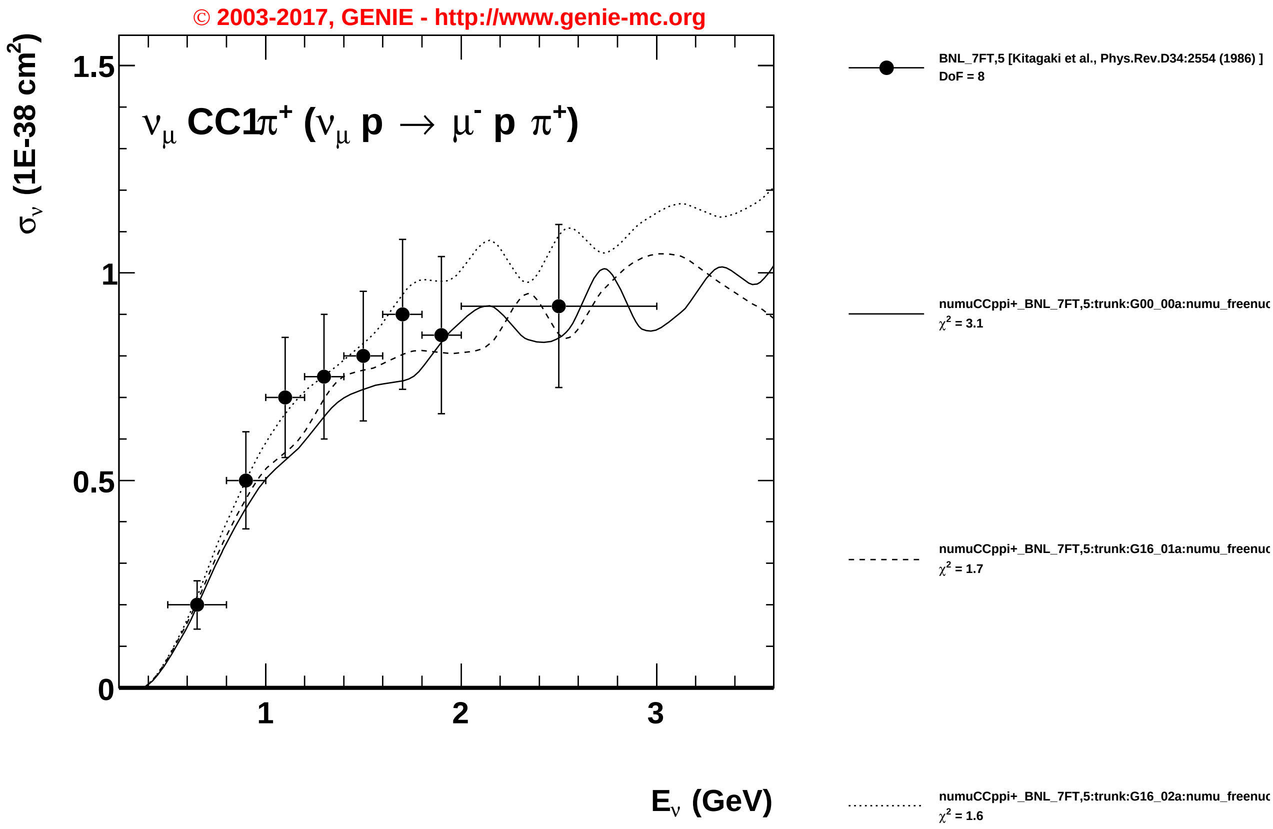
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
10
20
30
BEBC,13 [Allasia et al., Nucl.Phys.B343:285 (1990)]
DoF = 4
numuCCppi+_BEBC,13:trunk:G00_00a:numu_freenuc
χ^2 = 11.9
numuCCppi+_BEBC,13:trunk:G16_01a:numu_freenuc
χ^2 = 58.7
numuCCppi+_BEBC,13:trunk:G16_02a:numu_freenuc
χ^2 = 72.2



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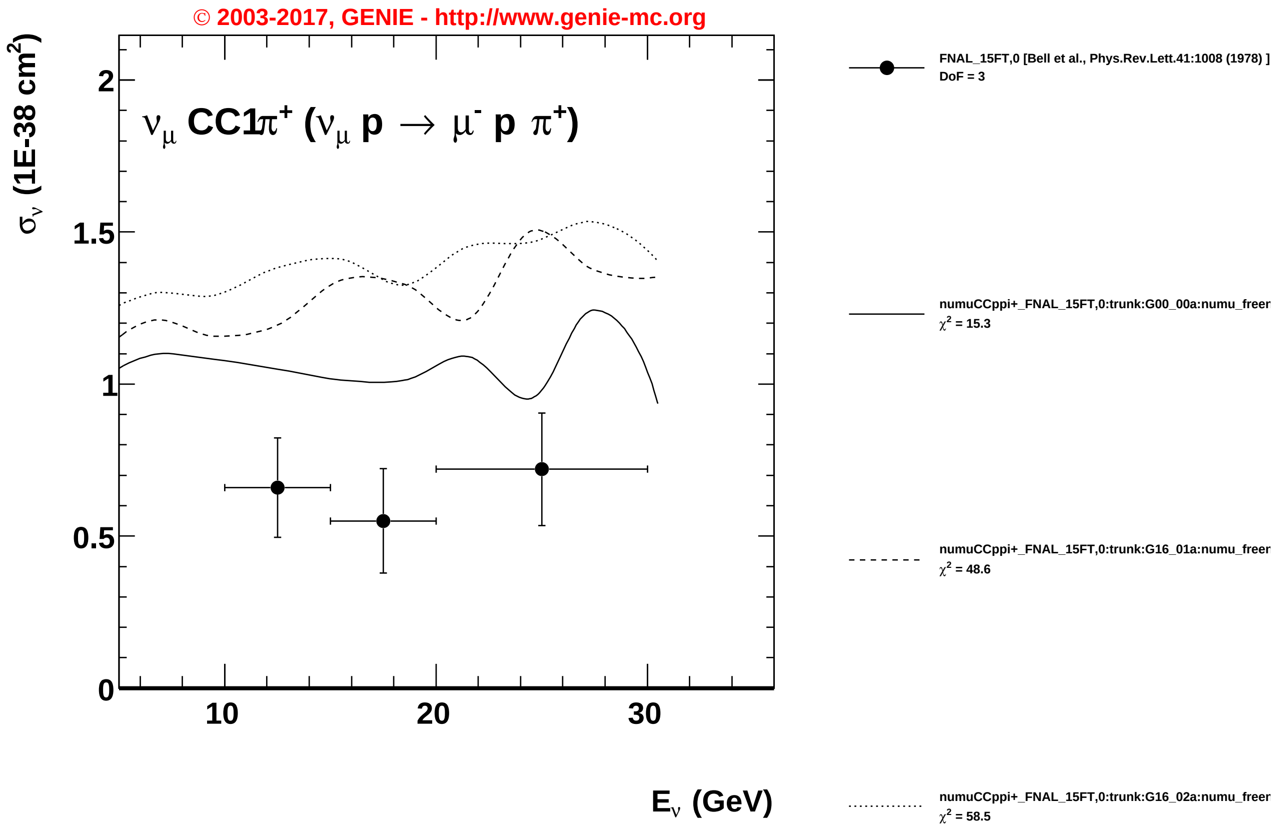
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
BNL_7FT,5 [Kitagaki et al., Phys.Rev.D34:2554 (1986)]
DoF = 8
numuCCppi+_BNL_7FT,5:trunk:G00_00a:numu_freenuc
χ^2 = 3.1
numuCCppi+_BNL_7FT,5:trunk:G16_01a:numu_freenuc
χ^2 = 1.7
numuCCppi+_BNL_7FT,5:trunk:G16_02a:numu_freenuc
χ^2 = 1.6



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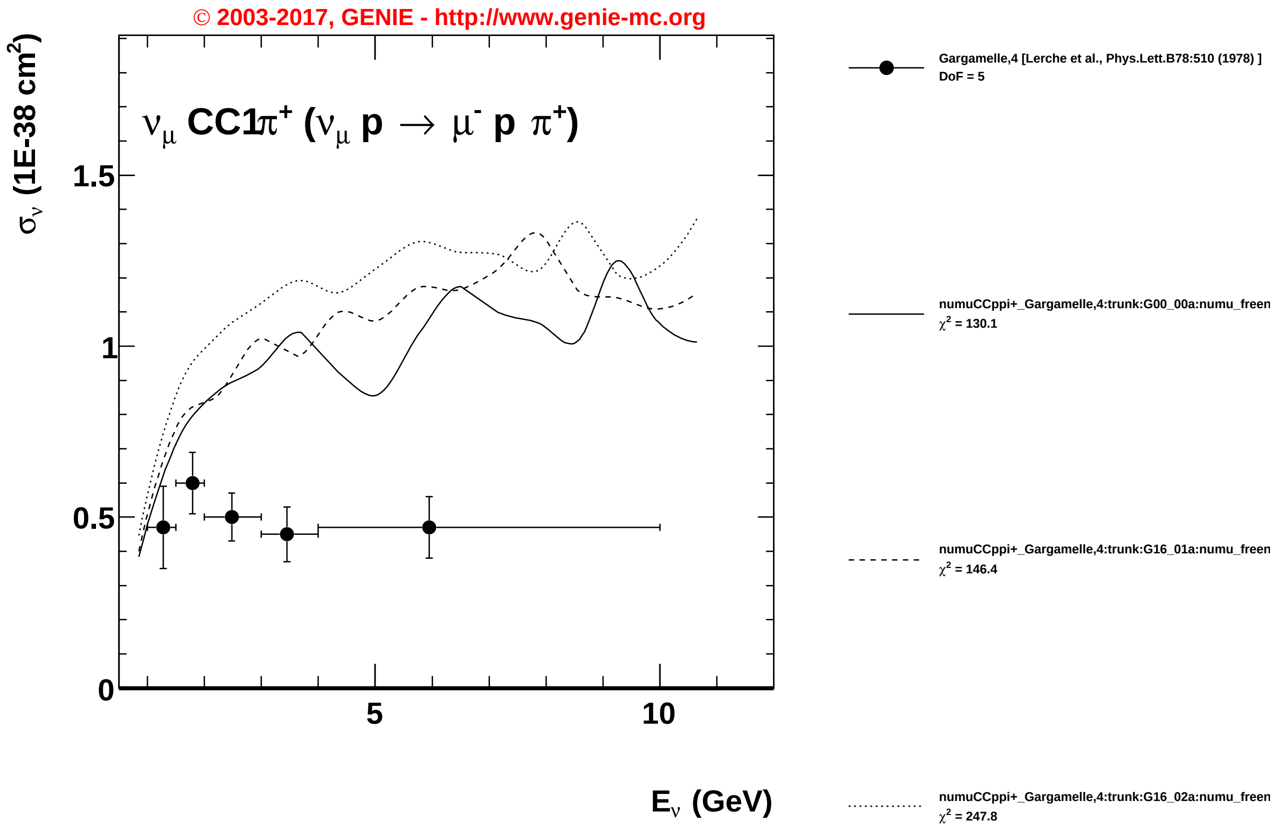
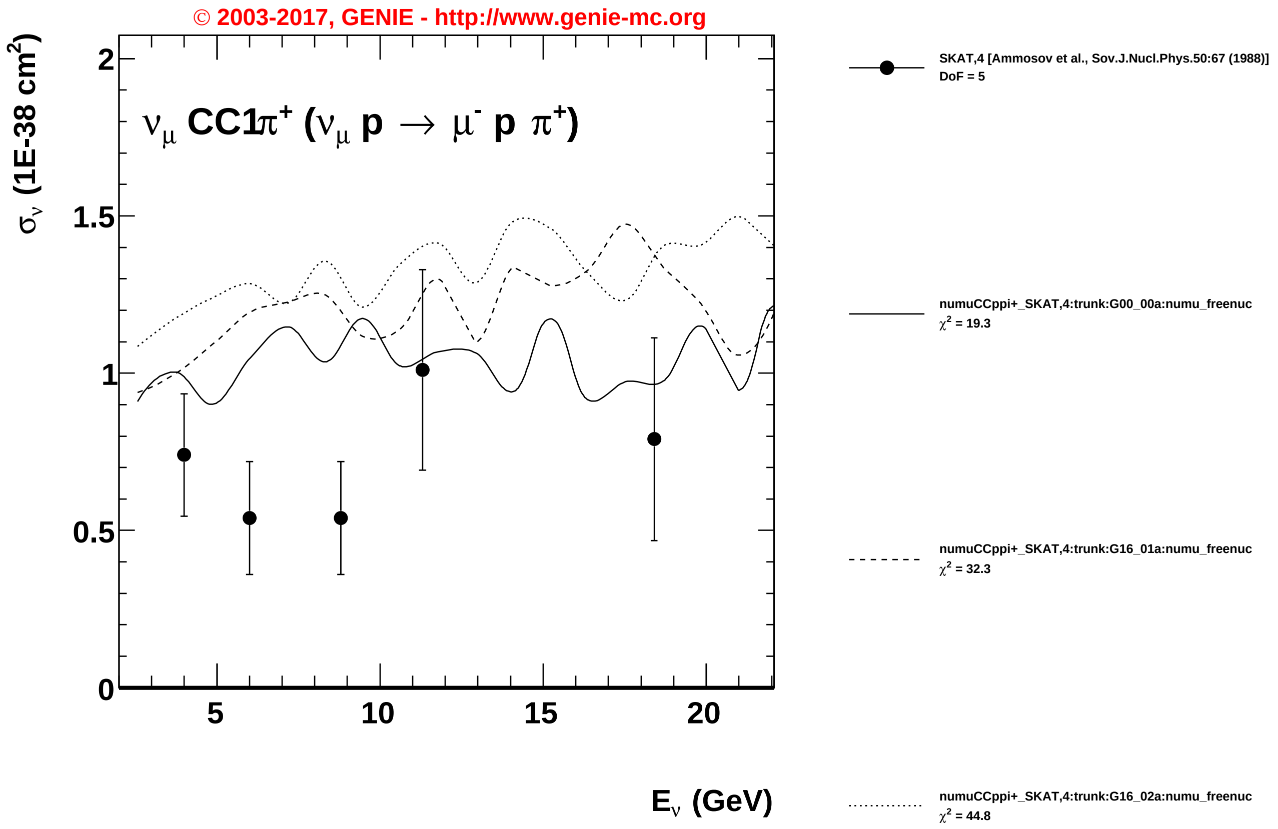
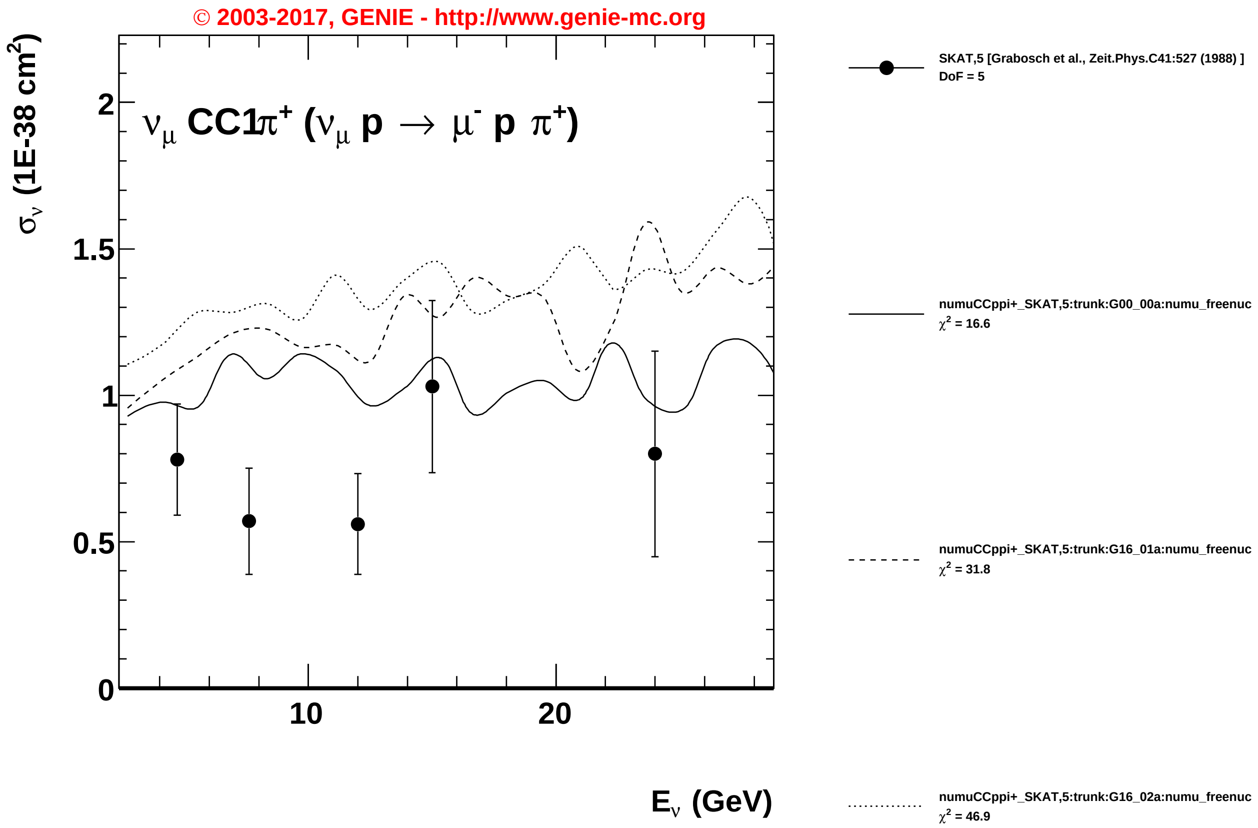
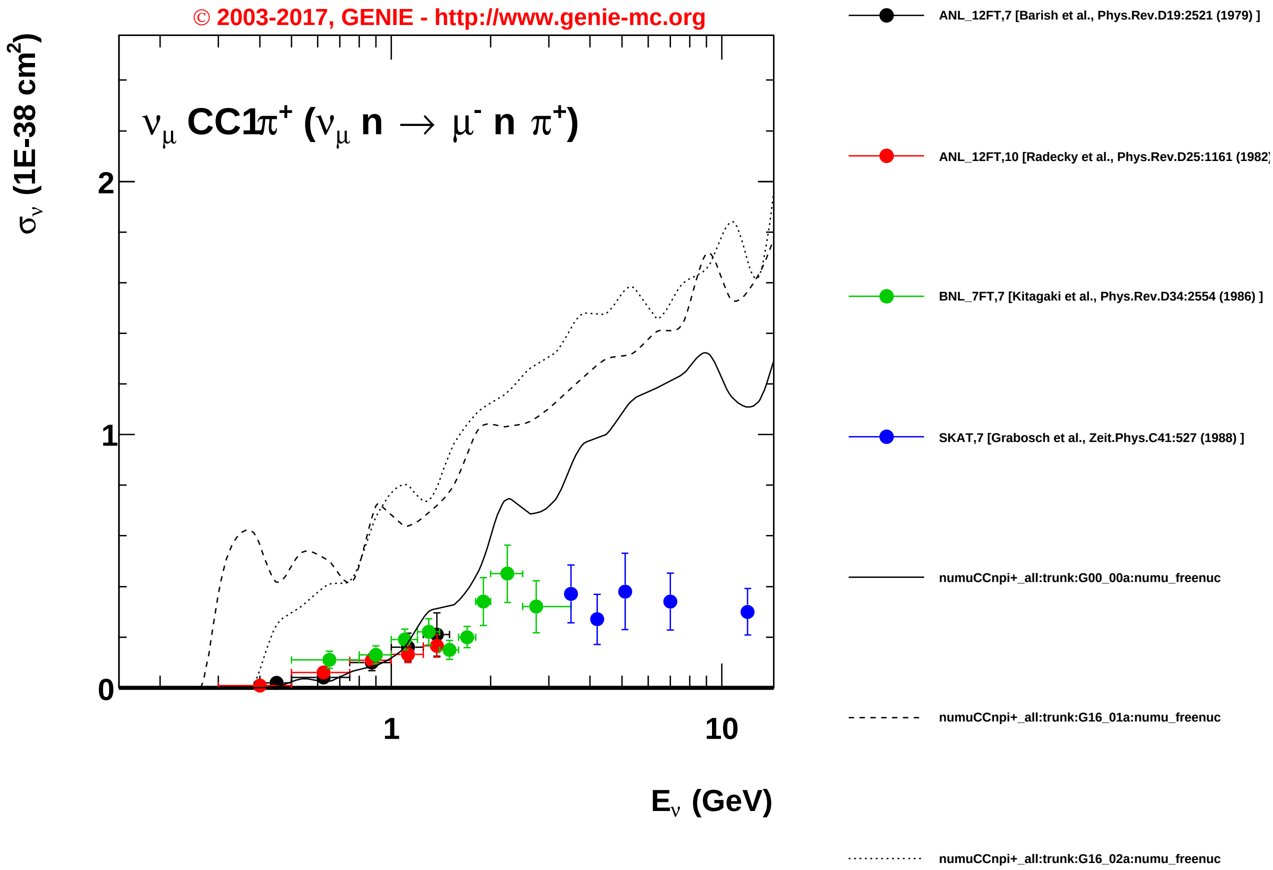
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
10
20
30
FNAL_15FT,0 [Bell et al., Phys.Rev.Lett.41:1008 (1978)]
DoF = 3
numuCCppi+_FNAL_15FT,0:trunk:G00_00a:numu_freer
χ^2 = 15.3
numuCCppi+_FNAL_15FT,0:trunk:G16_01a:numu_freer
χ^2 = 48.6
numuCCppi+_FNAL_15FT,0:trunk:G16_02a:numu_freer
χ^2 = 58.5


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
5
10
Gargamelle,4 [Lerche et al., Phys.Lett.B78:510 (1978)]
DoF = 5
numuCCppi+_Gargamelle,4:trunk:G00_00a:numu_freen
χ^2 = 130.1
numuCCppi+_Gargamelle,4:trunk:G16_01a:numu_freen
χ^2 = 146.4
numuCCppi+_Gargamelle,4:trunk:G16_02a:numu_freen
χ^2 = 247.8

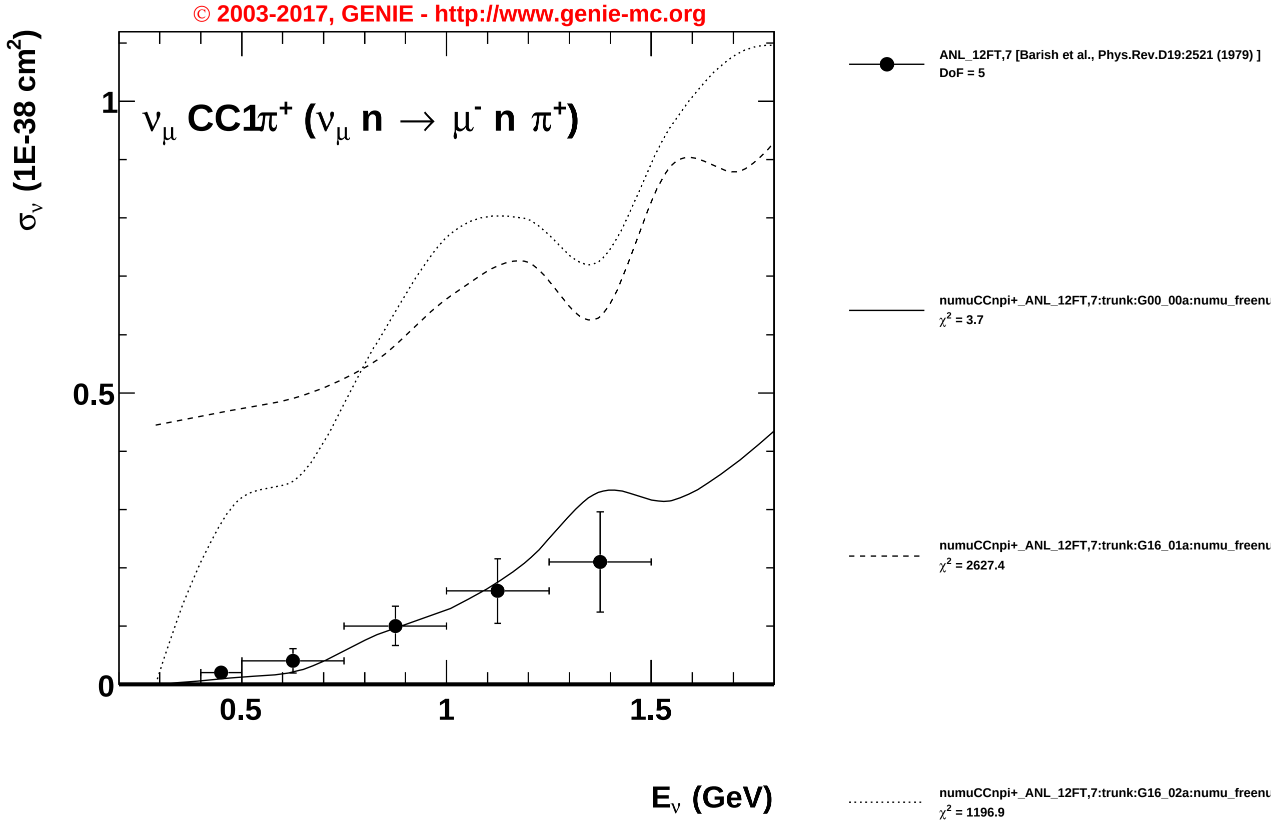


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
5
10
15
20
SKAT,4 [Ammosov et al., Sov.J.Nucl.Phys.50:67 (1988)]
DoF = 5
numuCCppi+_SKAT,4:trunk:G00_00a:numu_freenuc
χ^2 = 19.3
numuCCppi+_SKAT,4:trunk:G16_01a:numu_freenuc
χ^2 = 32.3
numuCCppi+_SKAT,4:trunk:G16_02a:numu_freenuc
χ^2 = 44.8

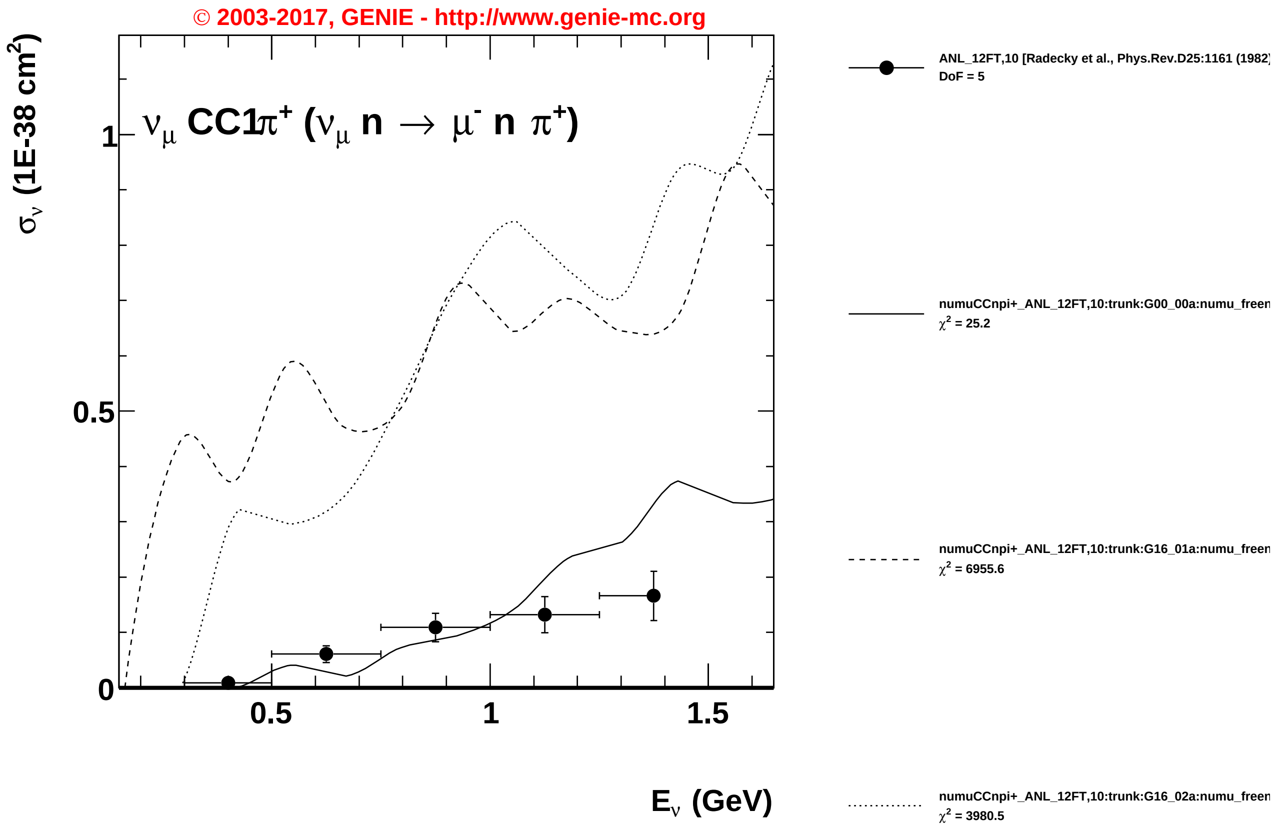

© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ p $\rightarrow$ μ^- p π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
2
10
20
SKAT,5 [Grabosch et al., Zeit.Phys.C41:527 (1988)]
DoF = 5
numuCCppi+_SKAT,5:trunk:G00_00a:numu_freenuc
χ^2 = 16.6
numuCCppi+_SKAT,5:trunk:G16_01a:numu_freenuc
χ^2 = 31.8
numuCCppi+_SKAT,5:trunk:G16_02a:numu_freenuc
χ^2 = 46.9



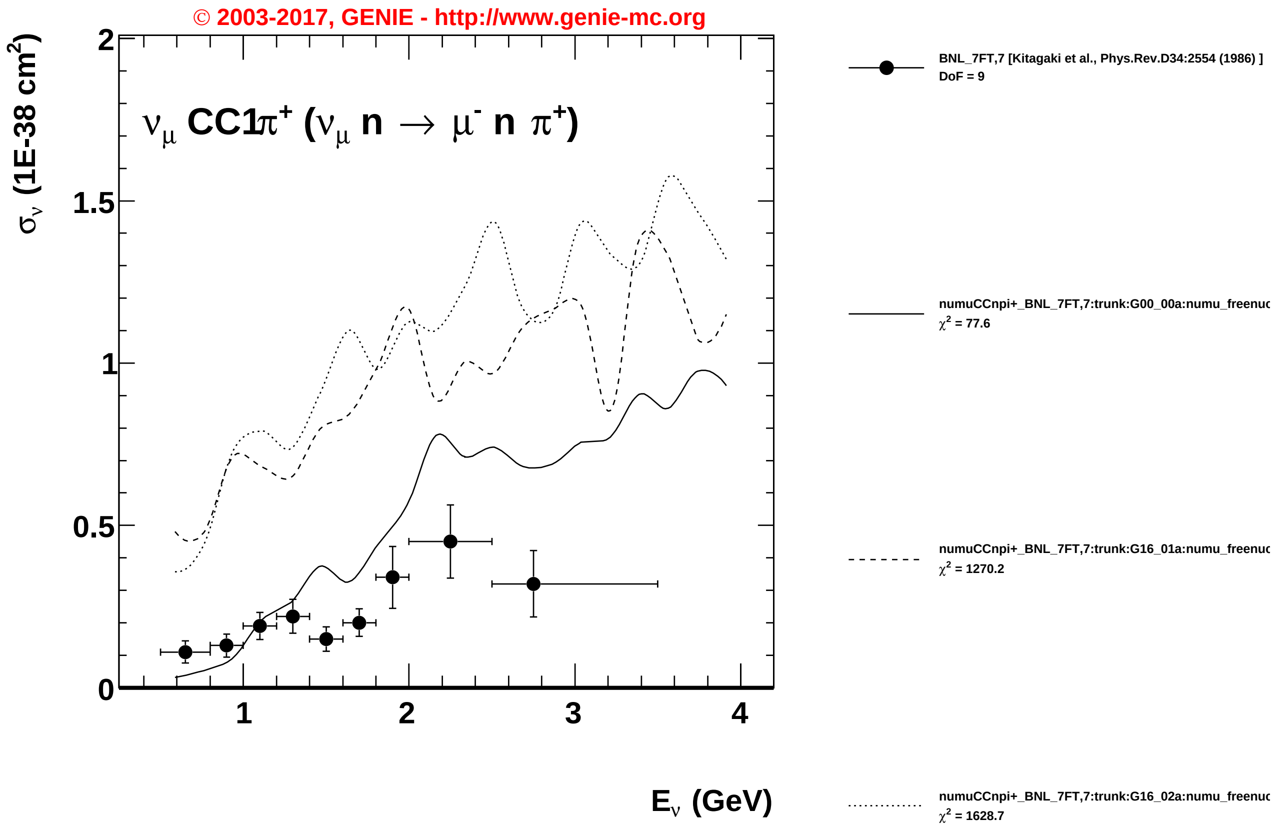
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ n $\rightarrow$ μ^- n π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
1
2
1
10
ANL_12FT,7 [Barish et al., Phys.Rev.D19:2521 (1979)]
ANL_12FT,10 [Radecky et al., Phys.Rev.D25:1161 (1982)
BNL_7FT,7 [Kitagaki et al., Phys.Rev.D34:2554 (1986)]
SKAT,7 [Grabosch et al., Zeit.Phys.C41:527 (1988)]
numuCCnpi+_all:trunk:G00_00a:numu_freenuc
numuCCnpi+_all:trunk:G16_01a:numu_freenuc
numuCCnpi+_all:trunk:G16_02a:numu_freenuc



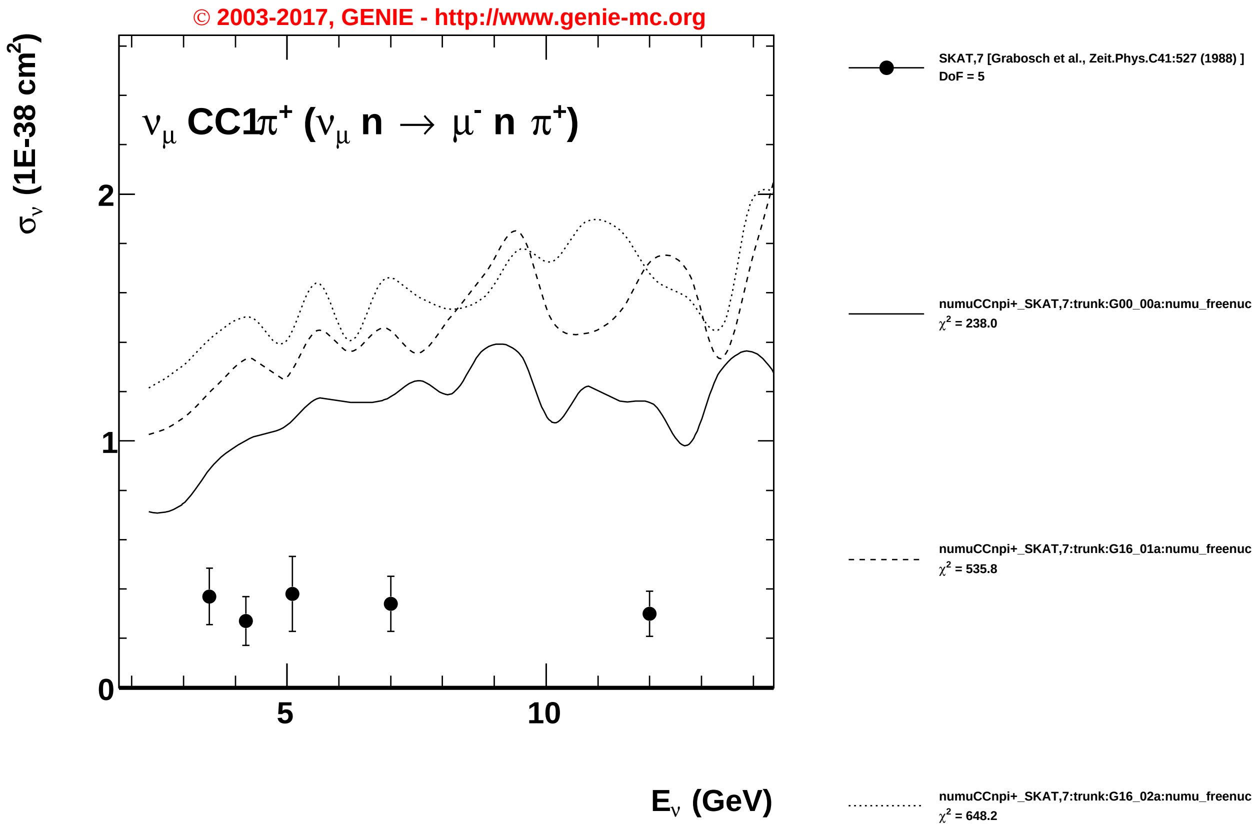
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ n $\rightarrow$ μ^- n π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
ANL_12FT,7 [Barish et al., Phys.Rev.D19:2521 (1979)]
DoF = 5
numuCCnpi+_ANL_12FT,7:trunk:G00_00a:numu_freenu
χ^2 = 3.7
numuCCnpi+_ANL_12FT,7:trunk:G16_01a:numu_freenu
χ^2 = 2627.4
numuCCnpi+_ANL_12FT,7:trunk:G16_02a:numu_freenu
χ^2 = 1196.9



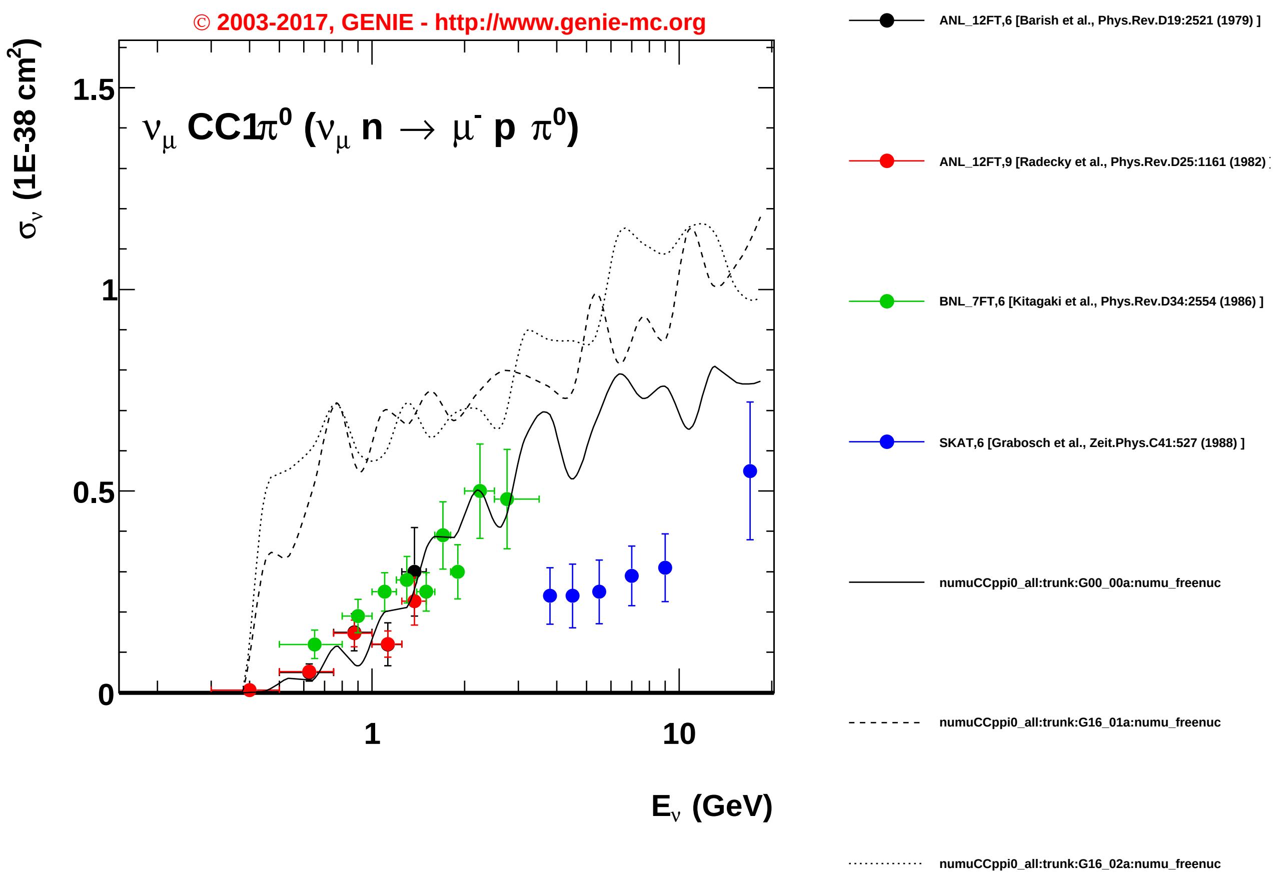
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ n $\rightarrow$ μ^- n π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
0.5
1
1.5
ANL_12FT,10 [Radecky et al., Phys.Rev.D25:1161 (1982)
DoF = 5
numuCCnpi+_ANL_12FT,10:trunk:G00_00a:numu_freen
χ^2 = 25.2
numuCCnpi+_ANL_12FT,10:trunk:G16_01a:numu_freen
χ^2 = 6955.6
numuCCnpi+_ANL_12FT,10:trunk:G16_02a:numu_freen
χ^2 = 3980.5

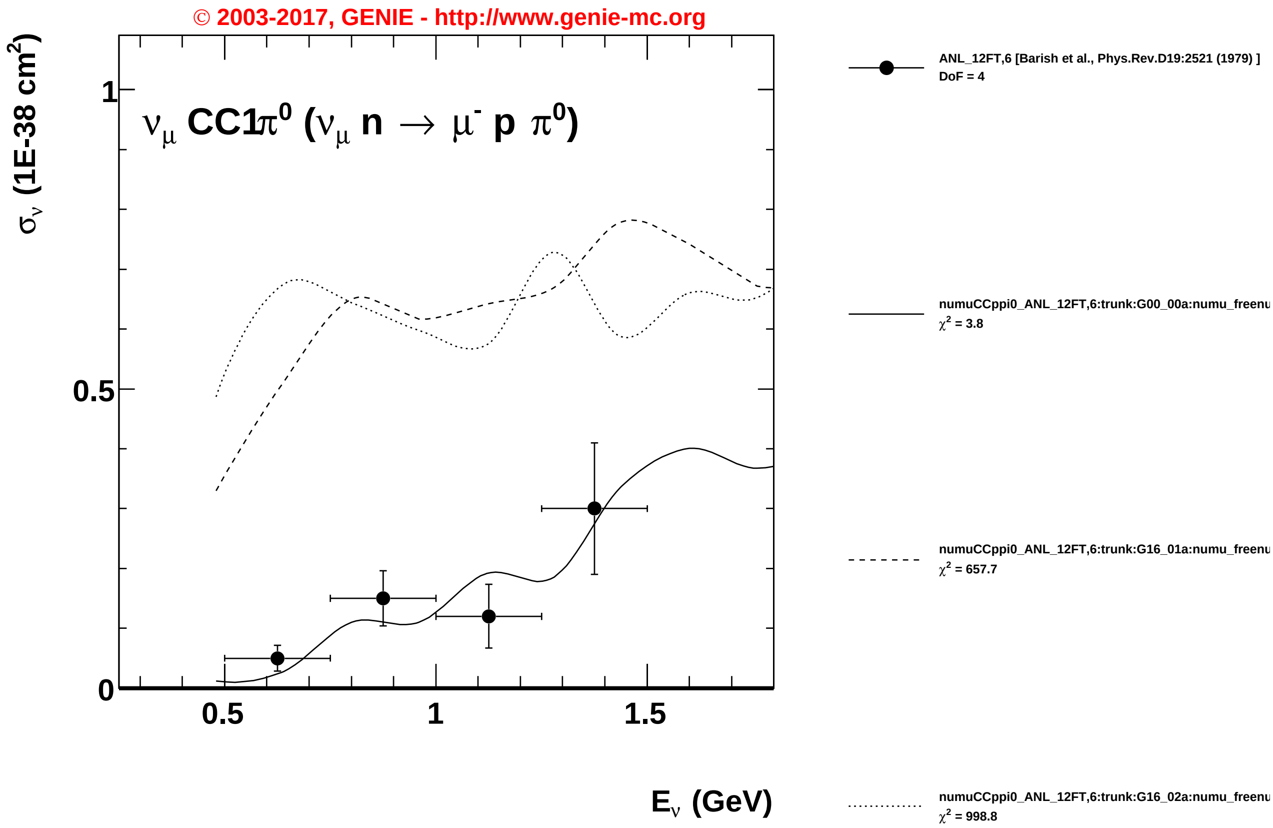


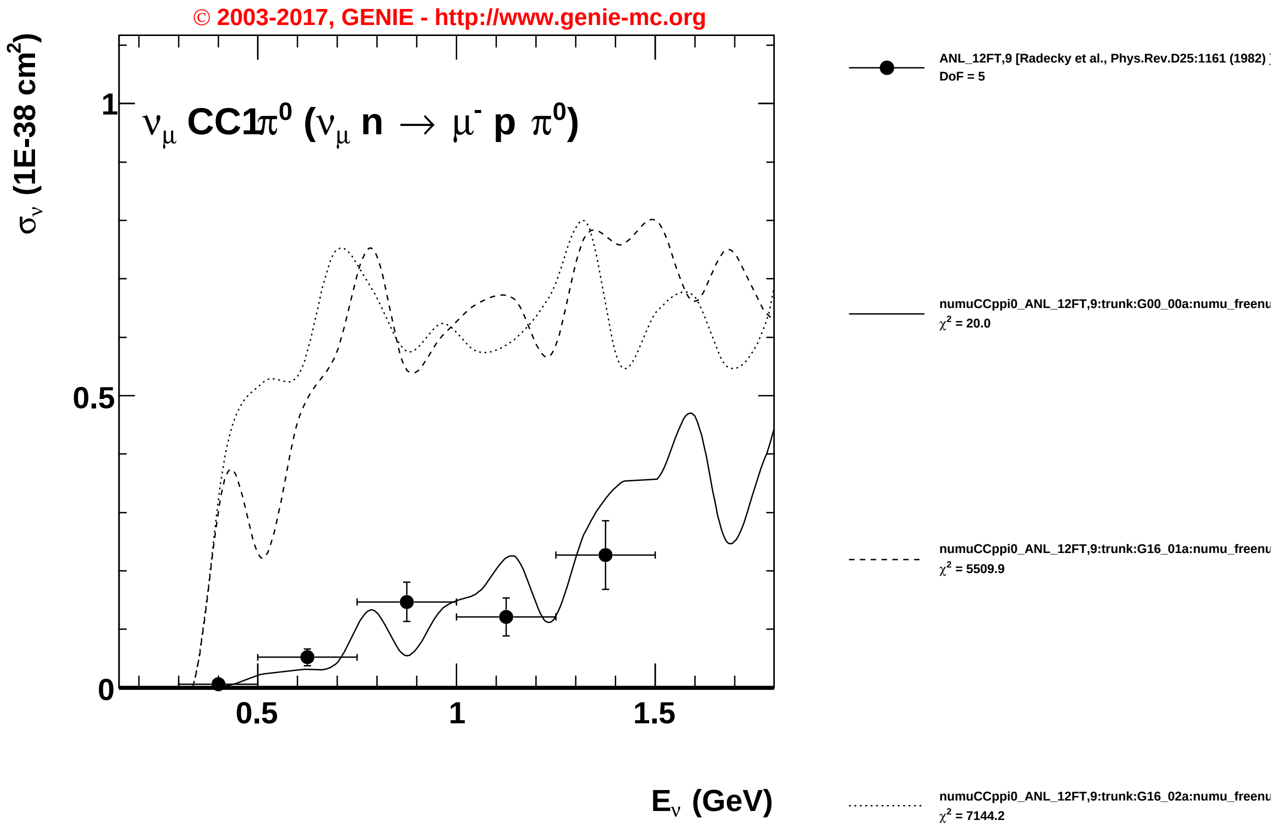
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ n $\rightarrow$ μ^- n π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
BNL_7FT,7 [Kitagaki et al., Phys.Rev.D34:2554 (1986)]
DoF = 9
numuCCnpi+_BNL_7FT,7:trunk:G00_00a:numu_freenuc
χ^2 = 77.6
numuCCnpi+_BNL_7FT,7:trunk:G16_01a:numu_freenuc
χ^2 = 1270.2
numuCCnpi+_BNL_7FT,7:trunk:G16_02a:numu_freenuc
χ^2 = 1628.7



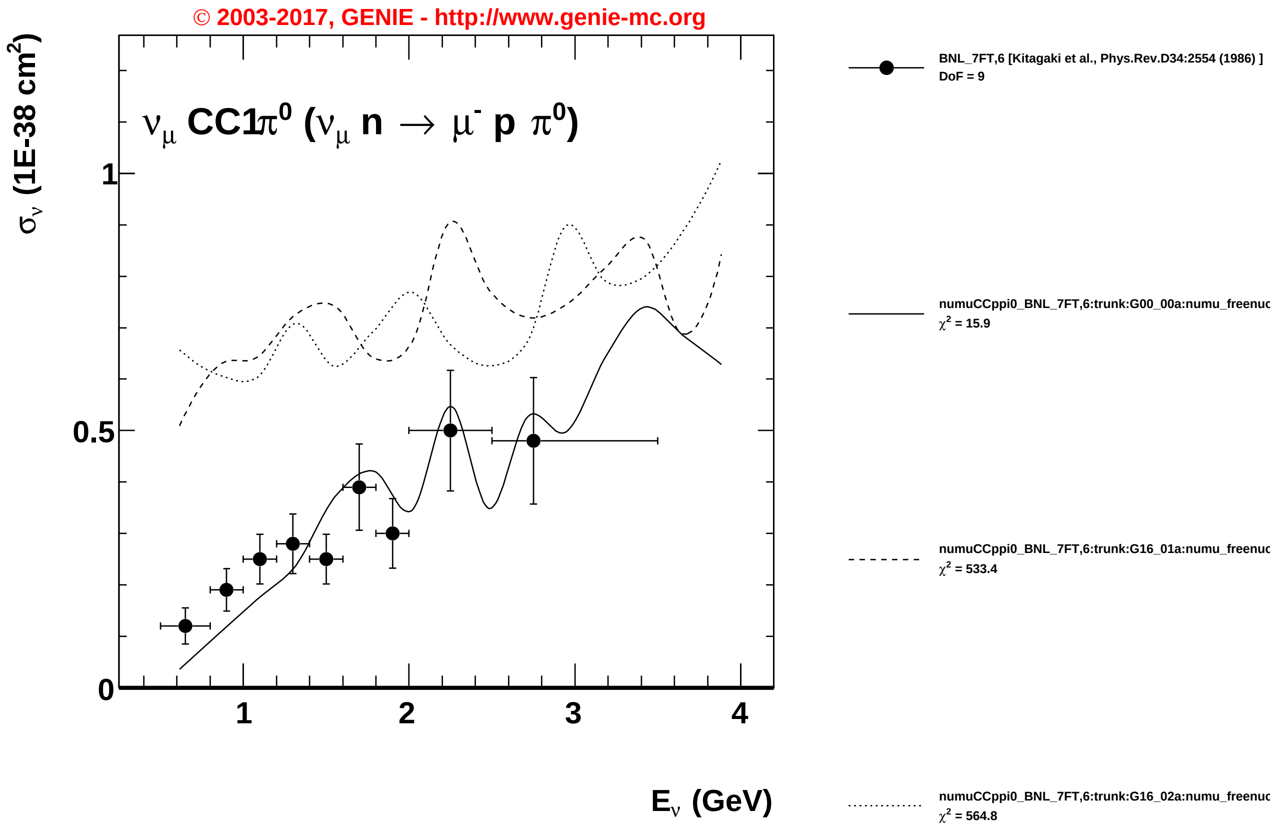
© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^+ (ν_μ n $\rightarrow$ μ^- n π^+)
σ_ν (1E-38 cm^2)
0
1
2
5
10
E_ν (GeV)
SKAT,7 [Grabosch et al., Zeit.Phys.C41:527 (1988)]
DoF = 5
numuCCnpi+_SKAT,7:trunk:G00_00a:numu_freenuc
χ^2 = 238.0
numuCCnpi+_SKAT,7:trunk:G16_01a:numu_freenuc
χ^2 = 535.8
numuCCnpi+_SKAT,7:trunk:G16_02a:numu_freenuc
χ^2 = 648.2


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^0 (ν_μ n $\rightarrow$ μ^- p π^0)
σ_ν (1E-38 cm^2)
1.5
1
0.5
0
1
10
E_ν (GeV)
ANL_12FT,6 [Barish et al., Phys.Rev.D19:2521 (1979)]
ANL_12FT,9 [Radecky et al., Phys.Rev.D25:1161 (1982)]
BNL_7FT,6 [Kitagaki et al., Phys.Rev.D34:2554 (1986)]
SKAT,6 [Grabosch et al., Zeit.Phys.C41:527 (1988)]
numuCCppi0_all:trunk:G00_00a:numu_freenuc
numuCCppi0_all:trunk:G16_01a:numu_freenuc
numuCCppi0_all:trunk:G16_02a:numu_freenuc


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^0 (ν_μ n $\rightarrow$ μ^- p π^0)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
0.5
1
1.5
ANL_12FT,6 [Barish et al., Phys.Rev.D19:2521 (1979)]
DoF = 4
numuCCppi0_ANL_12FT,6:trunk:G00_00a:numu_freenu
χ^2 = 3.8
numuCCppi0_ANL_12FT,6:trunk:G16_01a:numu_freenu
χ^2 = 657.7
numuCCppi0_ANL_12FT,6:trunk:G16_02a:numu_freenu
χ^2 = 998.8



© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^0 (ν_μ n $\rightarrow$ μ^- p π^0)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
0.5
1
1.5
ANL_12FT,9 [Radecky et al., Phys.Rev.D25:1161 (1982)]
DoF = 5
numuCCppi0_ANL_12FT,9:trunk:G00_00a:numu_freenu
χ^2 = 20.0
numuCCppi0_ANL_12FT,9:trunk:G16_01a:numu_freenu
χ^2 = 5509.9
numuCCppi0_ANL_12FT,9:trunk:G16_02a:numu_freenu
χ^2 = 7144.2



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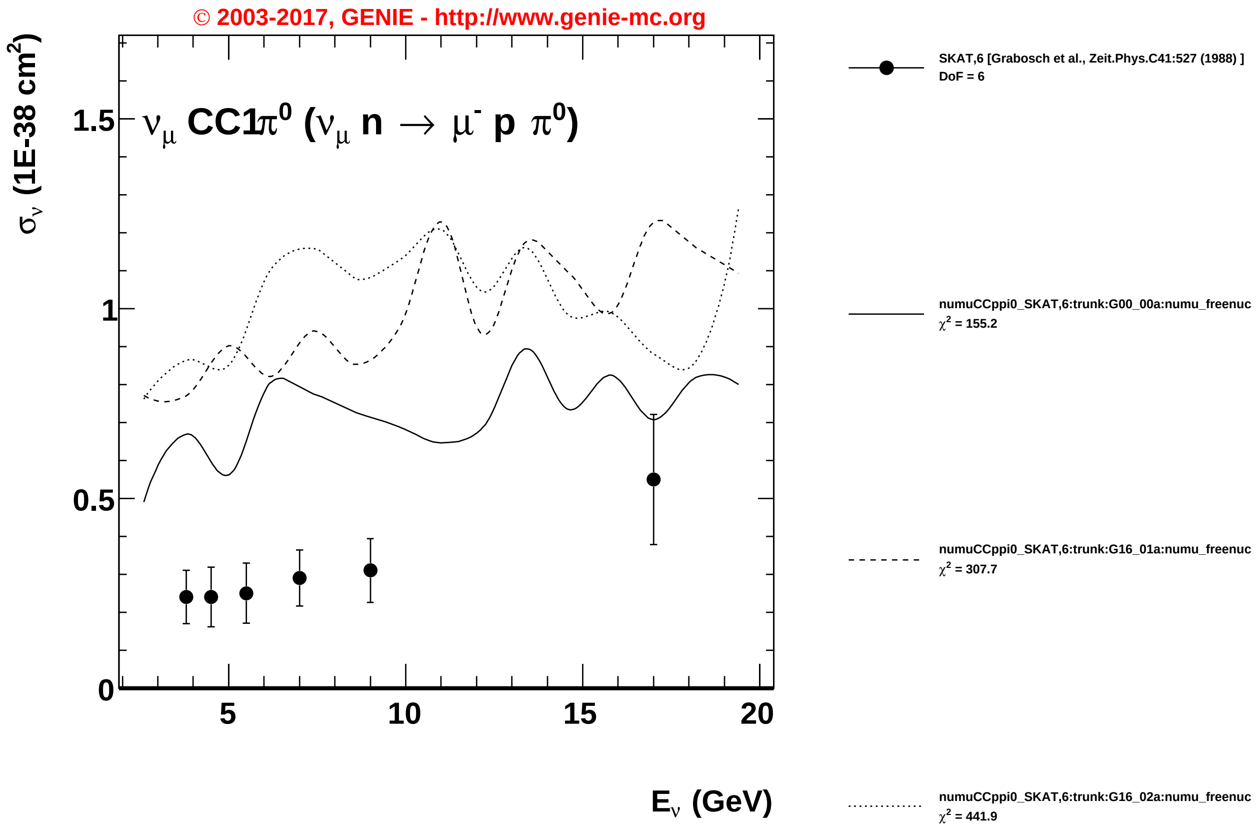
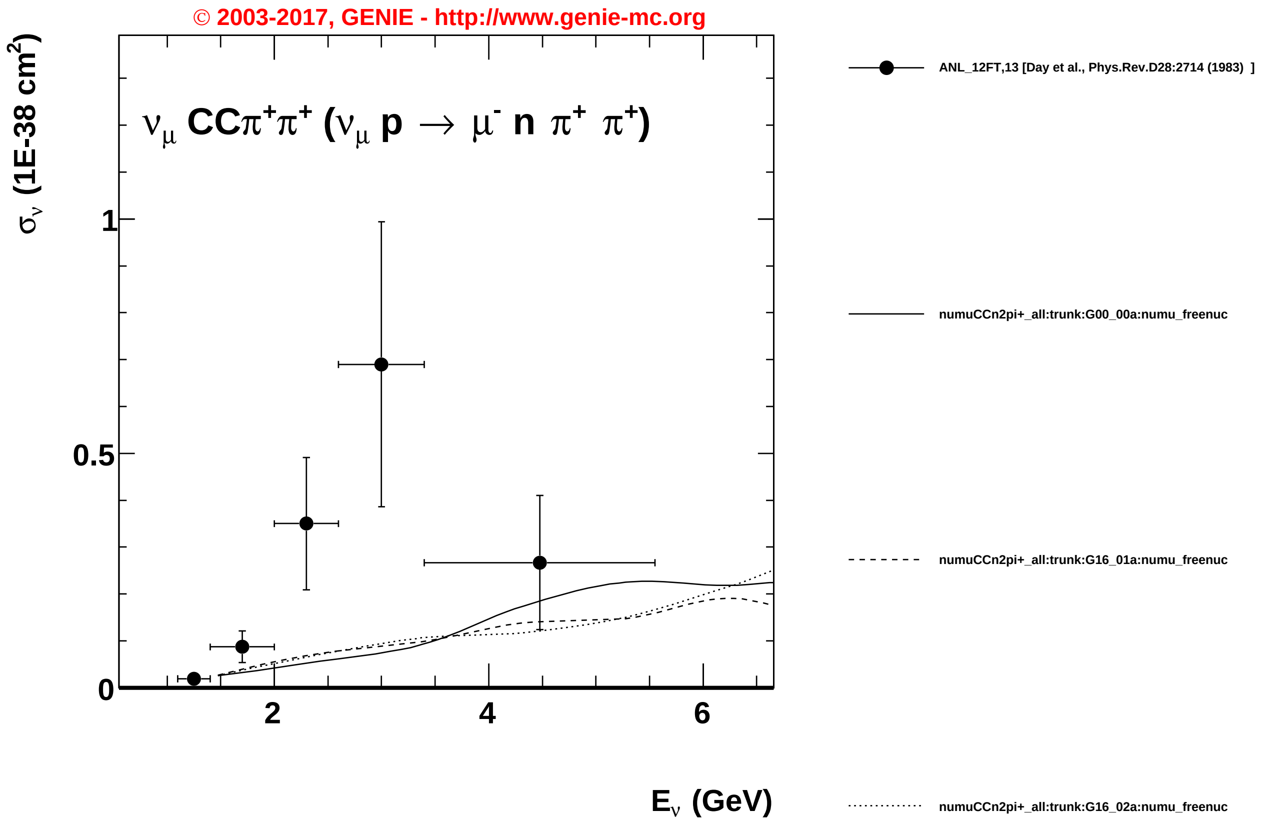
ν_μ CC1π^0 (ν_μ n $\rightarrow$ μ^- p π^0)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1
2
3
4
BNL_7FT,6 [Kitagaki et al., Phys.Rev.D34:2554 (1986)]
DoF = 9
numuCCppi0_BNL_7FT,6:trunk:G00_00a:numu_freenuc
χ^2 = 15.9
numuCCppi0_BNL_7FT,6:trunk:G16_01a:numu_freenuc
χ^2 = 533.4
numuCCppi0_BNL_7FT,6:trunk:G16_02a:numu_freenuc
χ^2 = 564.8


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC1π^0 (ν_μ n $\rightarrow$ μ^- p π^0)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1.5
5
10
15
20
SKAT,6 [Grabosch et al., Zeit.Phys.C41:527 (1988)]
DoF = 6
numuCCppi0_SKAT,6:trunk:G00_00a:numu_freenuc
χ^2 = 155.2
numuCCppi0_SKAT,6:trunk:G16_01a:numu_freenuc
χ^2 = 307.7
numuCCppi0_SKAT,6:trunk:G16_02a:numu_freenuc
χ^2 = 441.9



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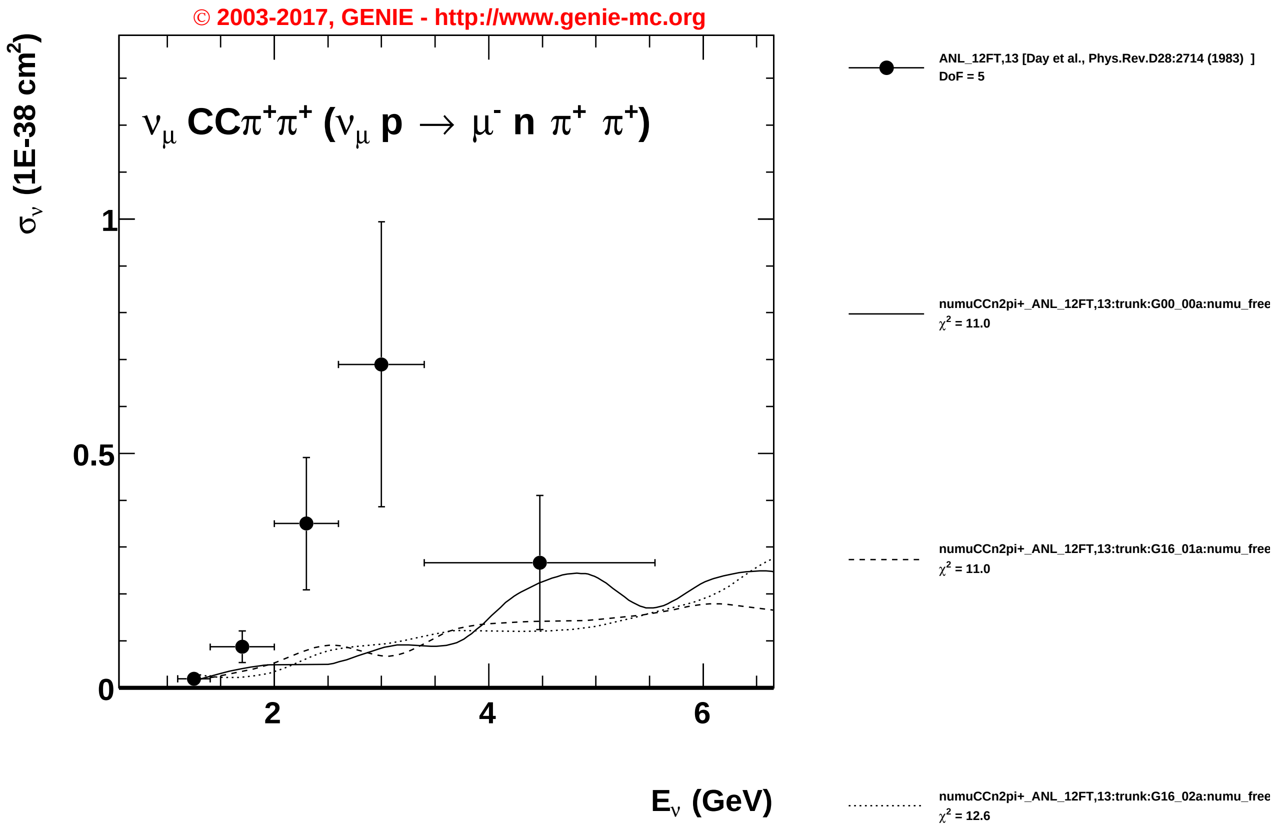
ν_μ CC$\pi^+\pi^+$ (ν_μ p $\rightarrow$ μ^- n π^+ π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
2
4
6
ANL_12FT,13 [Day et al., Phys.Rev.D28:2714 (1983)]
numuCCn2pi+_all:trunk:G00_00a:numu_freenuc
numuCCn2pi+_all:trunk:G16_01a:numu_freenuc
numuCCn2pi+_all:trunk:G16_02a:numu_freenuc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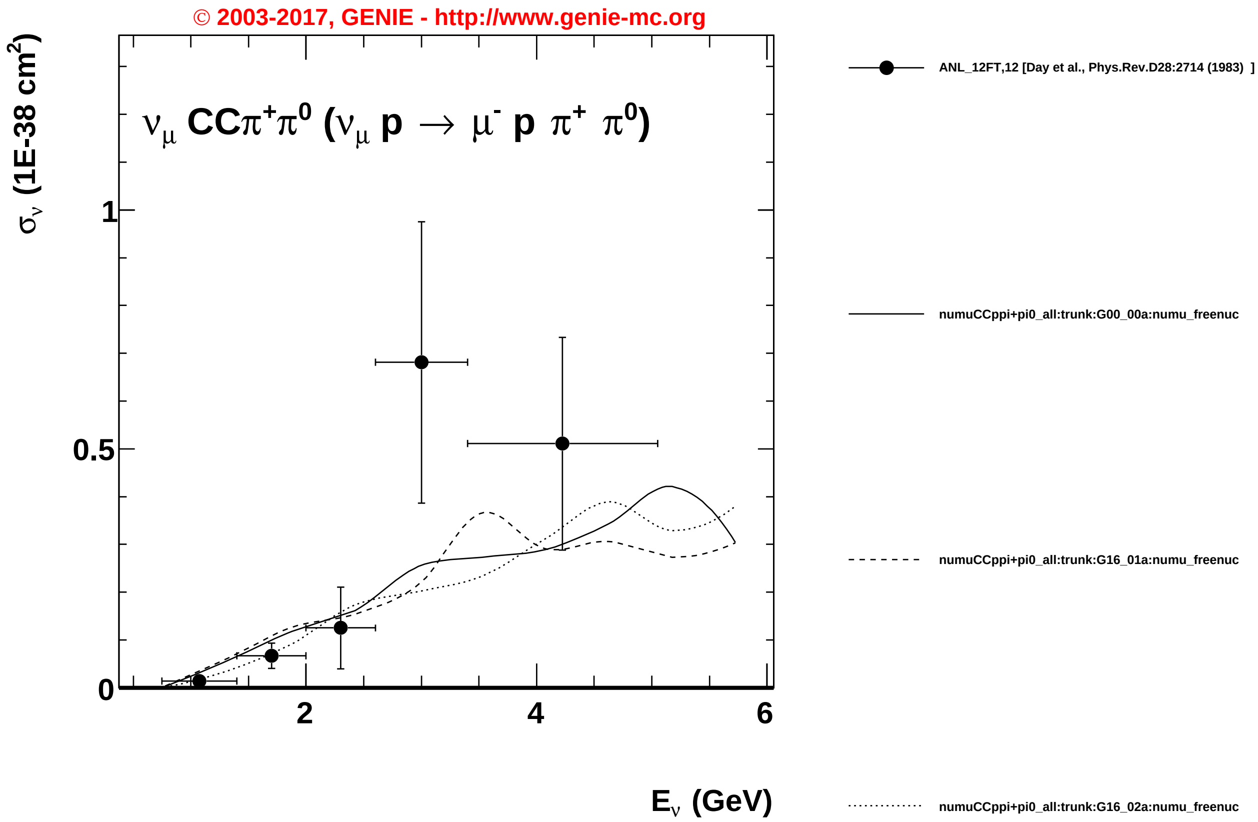
ν_μ CC$\pi^+\pi^+$ (ν_μ p $\rightarrow$ μ^- n π^+ π^+)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
2
4
6
ANL_12FT,13 [Day et al., Phys.Rev.D28:2714 (1983)]
DoF = 5
numuCCn2pi+_ANL_12FT,13:trunk:G00_00a:numu_free
χ^2 = 11.0
numuCCn2pi+_ANL_12FT,13:trunk:G16_01a:numu_free
χ^2 = 11.0
numuCCn2pi+_ANL_12FT,13:trunk:G16_02a:numu_free
χ^2 = 12.6



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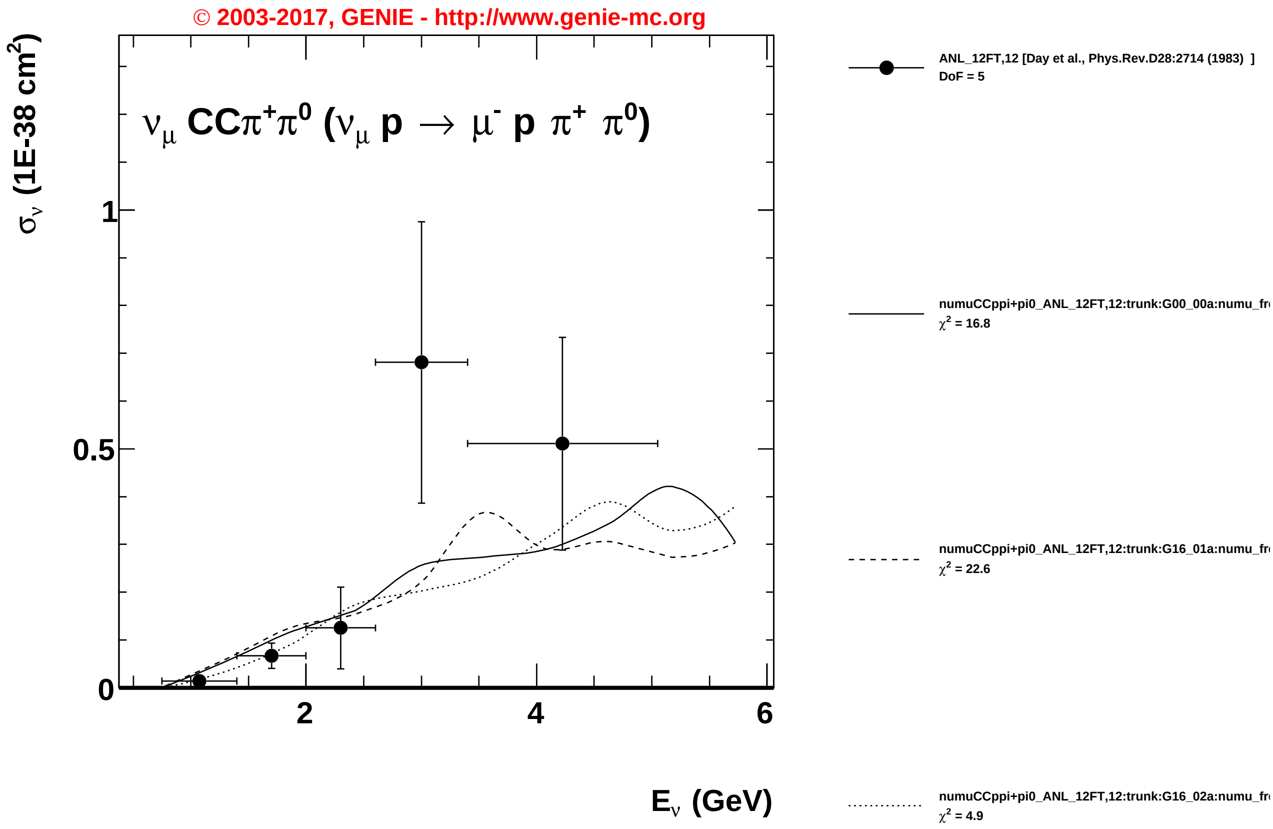
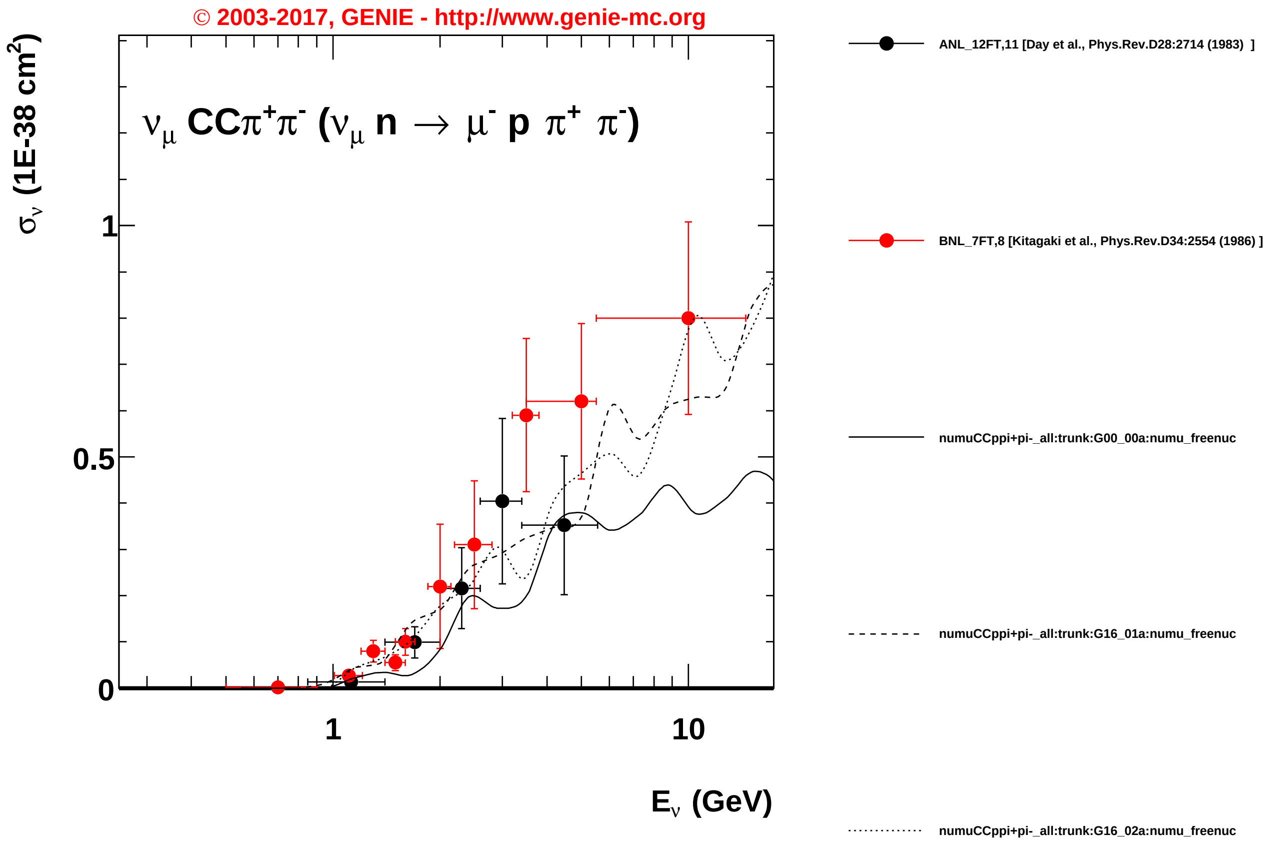
ν_μ CC$\pi^+\pi^0$ (ν_μ p $\rightarrow$ μ^- p π^+ π^0)
σ_ν (1E-38 cm^2)
0
0.5
1
2
4
6
E_ν (GeV)
ANL_12FT,12 [Day et al., Phys.Rev.D28:2714 (1983)]
numuCCppi+pi0_all:trunk:G00_00a:numu_freenuc
numuCCppi+pi0_all:trunk:G16_01a:numu_freenuc
numuCCppi+pi0_all:trunk:G16_02a:numu_freenuc


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC$\pi^+\pi^0$ (ν_μ p $\rightarrow$ μ^- p π^+ π^0)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
2
4
6
ANL_12FT,12 [Day et al., Phys.Rev.D28:2714 (1983)]
DoF = 5
numuCCppi+pi0_ANL_12FT,12:trunk:G00_00a:numu_fr
χ^2 = 16.8
numuCCppi+pi0_ANL_12FT,12:trunk:G16_01a:numu_fr
χ^2 = 22.6
numuCCppi+pi0_ANL_12FT,12:trunk:G16_02a:numu_fr
χ^2 = 4.9



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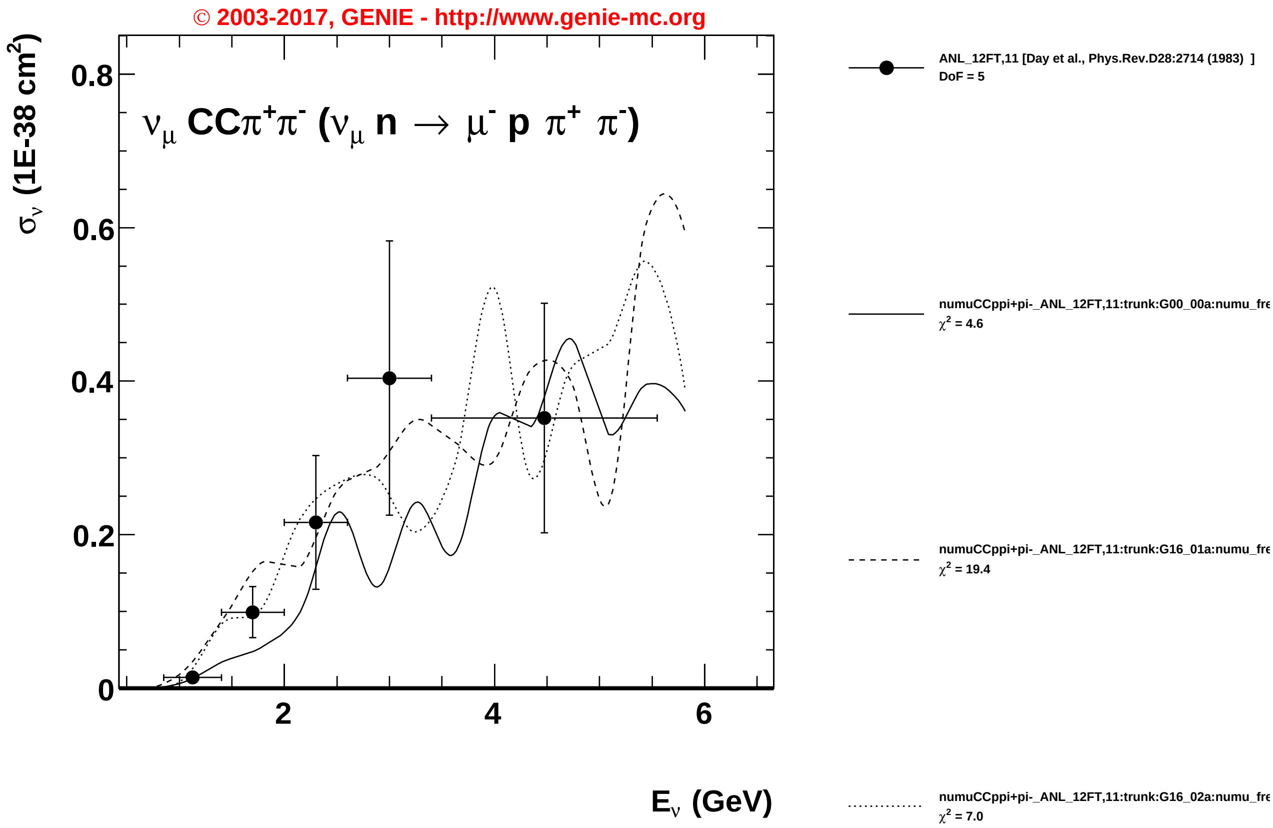
ν_μ CC$\pi^+\pi^-$ (ν_μ n $\rightarrow \mu^-$ p π^+ π^-)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1
10
ANL_12FT,11 [Day et al., Phys.Rev.D28:2714 (1983)]
BNL_7FT,8 [Kitagaki et al., Phys.Rev.D34:2554 (1986)]
numuCCppi+pi-_all:trunk:G00_00a:numu_freenuc
numuCCppi+pi-_all:trunk:G16_01a:numu_freenuc
numuCCppi+pi-_all:trunk:G16_02a:numu_freenuc



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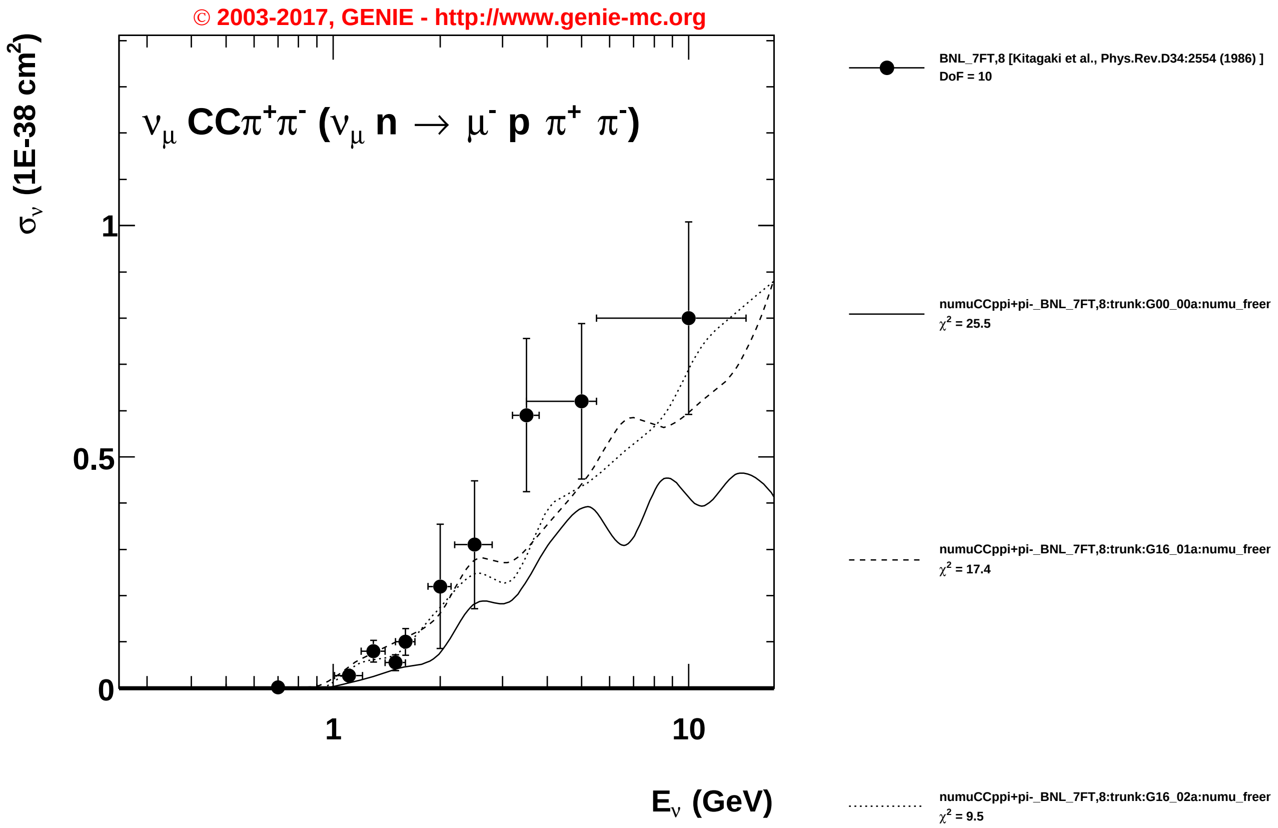
ν_μ CC$\pi^+\pi^-$ (ν_μ n $\rightarrow$ μ^- p π^+ π^-)
σ_ν (1E-38 cm^2)
0
0.2
0.4
0.6
0.8
2
4
6
E_ν (GeV)
ANL_12FT,11 [Day et al., Phys.Rev.D28:2714 (1983)]
DoF = 5
numuCCppi+pi-_ANL_12FT,11:trunk:G00_00a:numu_fre
χ^2 = 4.6
numuCCppi+pi-_ANL_12FT,11:trunk:G16_01a:numu_fre
χ^2 = 19.4
numuCCppi+pi-_ANL_12FT,11:trunk:G16_02a:numu_fre
χ^2 = 7.0



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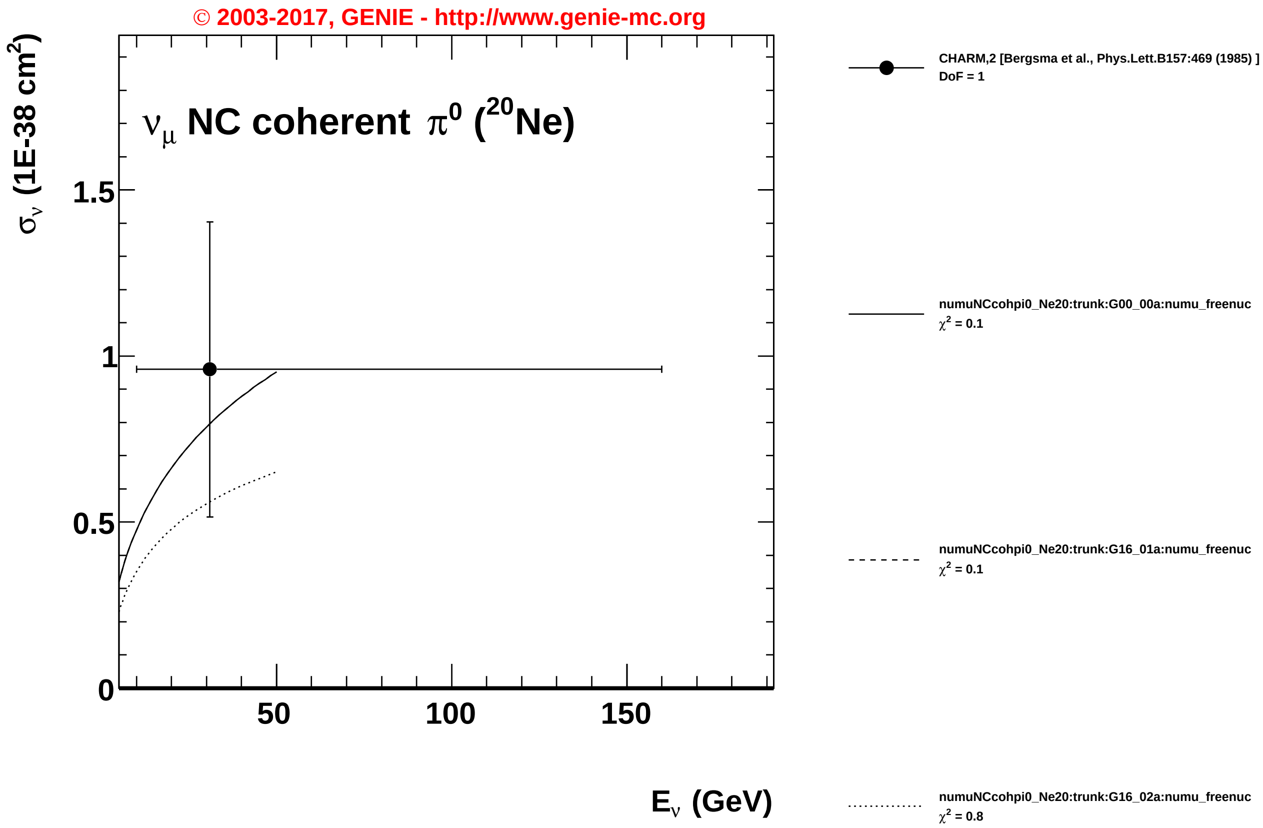
ν_μ CC$\pi^+\pi^-$ (ν_μ n $\rightarrow$ μ^- p π^+ π^-)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
1
10
BNL_7FT,8 [Kitagaki et al., Phys.Rev.D34:2554 (1986)]
DoF = 10
numuCCppi+pi-_BNL_7FT,8:trunk:G00_00a:numu_freer
χ^2 = 25.5
numuCCppi+pi-_BNL_7FT,8:trunk:G16_01a:numu_freer
χ^2 = 17.4
numuCCppi+pi-_BNL_7FT,8:trunk:G16_02a:numu_freer
χ^2 = 9.5



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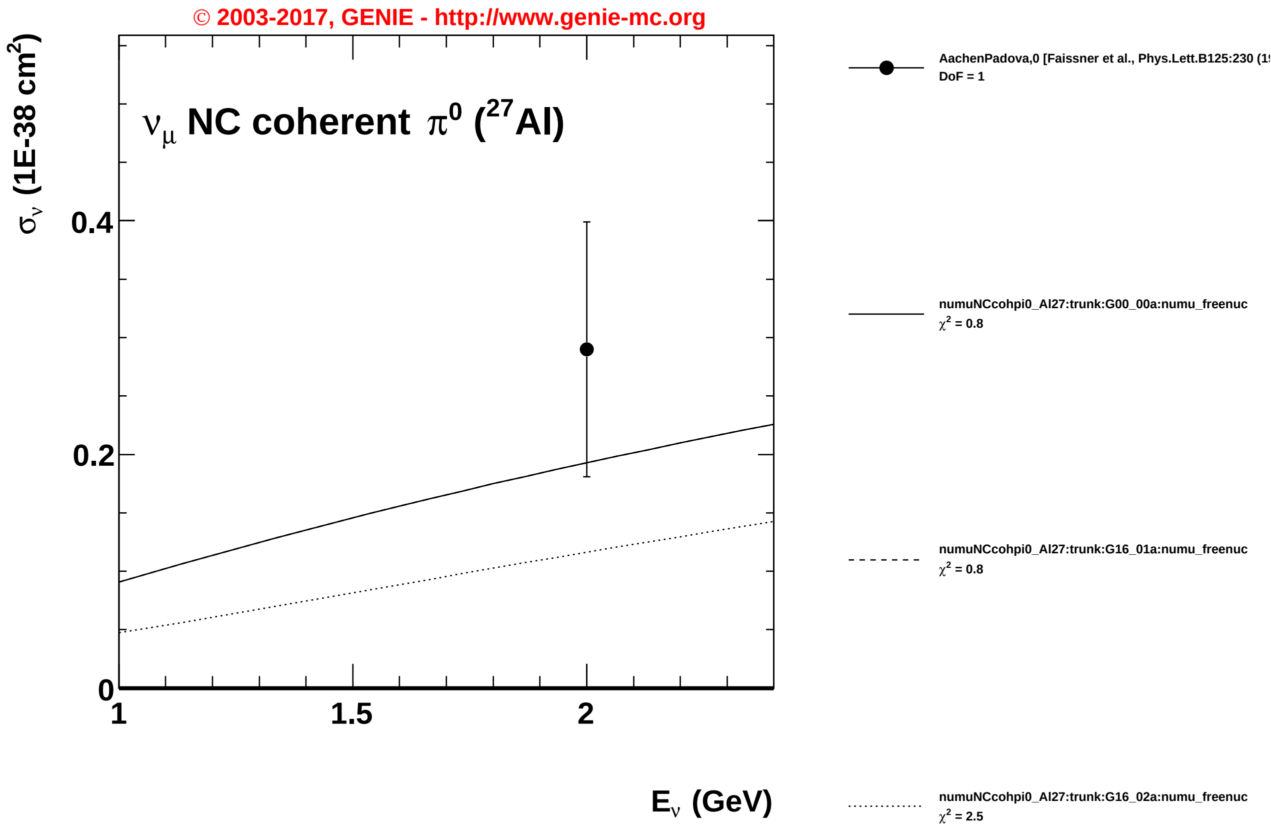
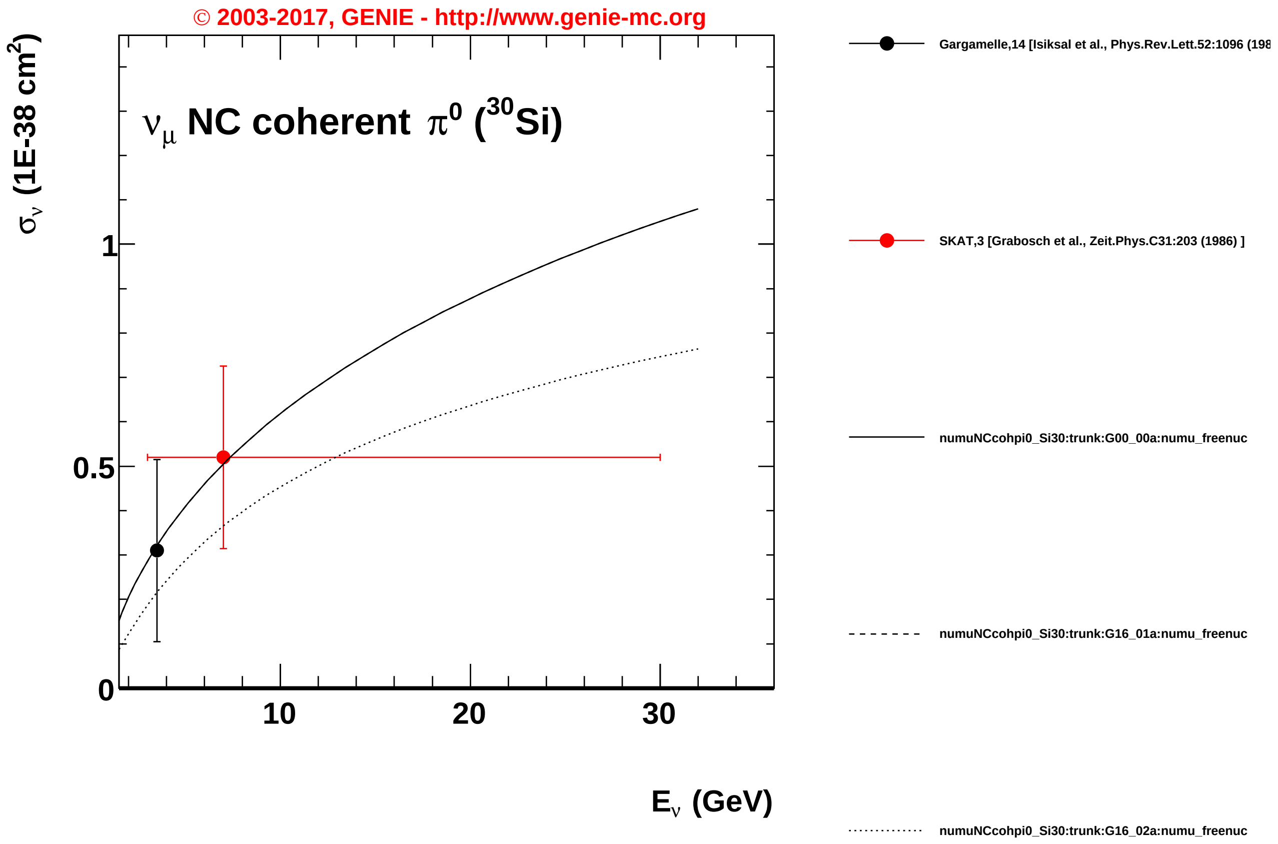
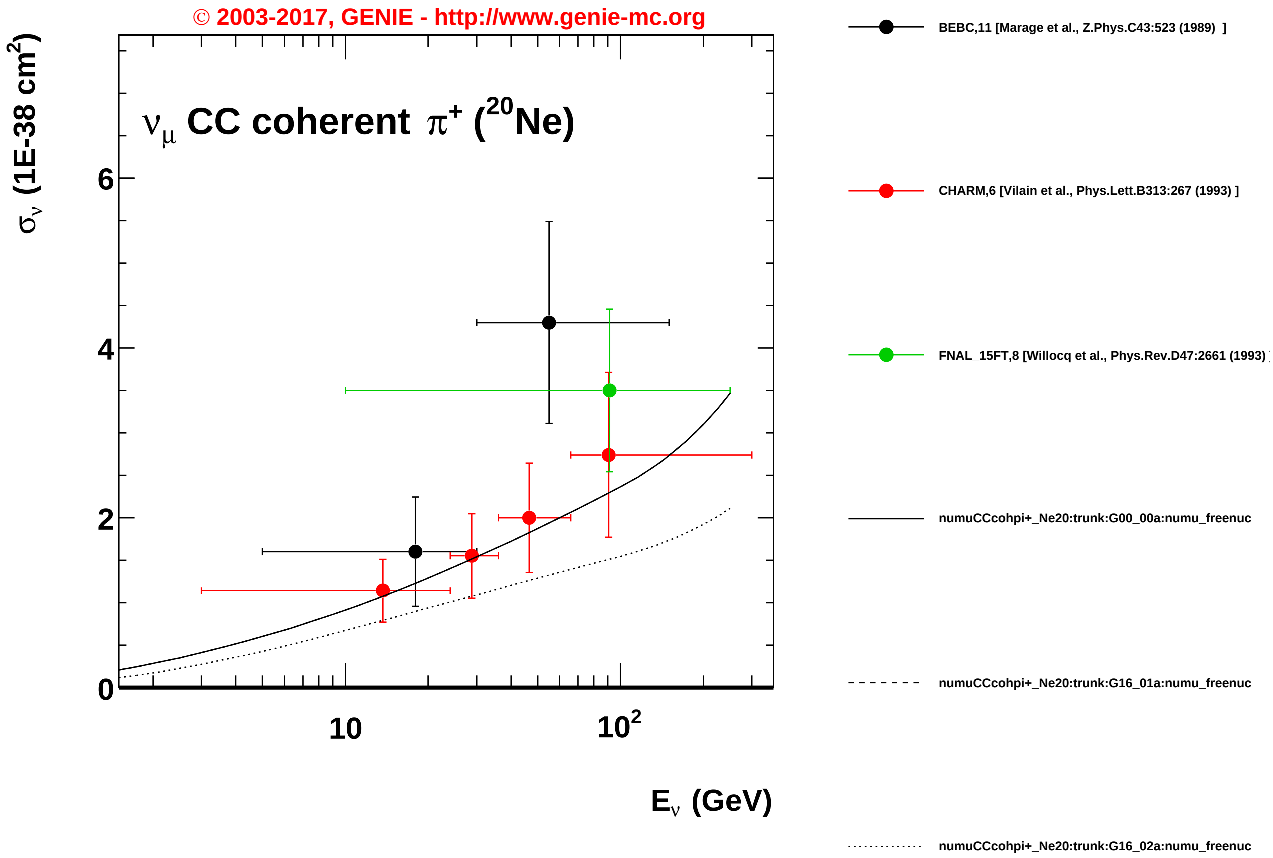
ν_μ NC coherent π^0 (^{20}Ne)
σ_ν (1E-38 cm^2)
0
0.5
1
1.5
50
100
150
E_ν (GeV)
CHARM,2 [Bergsma et al., Phys.Lett.B157:469 (1985)]
DoF = 1
numuNCcohpi0_Ne20:trunk:G00_00a:numu_freenuc
χ^2 = 0.1
numuNCcohpi0_Ne20:trunk:G16_01a:numu_freenuc
χ^2 = 0.1
numuNCcohpi0_Ne20:trunk:G16_02a:numu_freenuc
χ^2 = 0.8


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ NC coherent π^0 (^{27}Al)
σ_ν (1E-38 cm^2)
0.4
0.2
0
1
1.5
2
E_ν (GeV)
AachenPadova,0 [Faissner et al., Phys.Lett.B125:230 (1
DoF = 1
numuNCcohpi0_Al27:trunk:G00_00a:numu_freenuc
χ^2 = 0.8
numuNCcohpi0_Al27:trunk:G16_01a:numu_freenuc
χ^2 = 0.8
numuNCcohpi0_Al27:trunk:G16_02a:numu_freenuc
χ^2 = 2.5


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ NC coherent π^0 (^{30}Si)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
0.5
1
10
20
30
Gargamelle,14 [Isiksal et al., Phys.Rev.Lett.52:1096 (198
SKAT,3 [Grabosch et al., Zeit.Phys.C31:203 (1986)]
numuNCcohpi0_Si30:trunk:G00_00a:numu_freenuc
numuNCcohpi0_Si30:trunk:G16_01a:numu_freenuc
numuNCcohpi0_Si30:trunk:G16_02a:numu_freenuc



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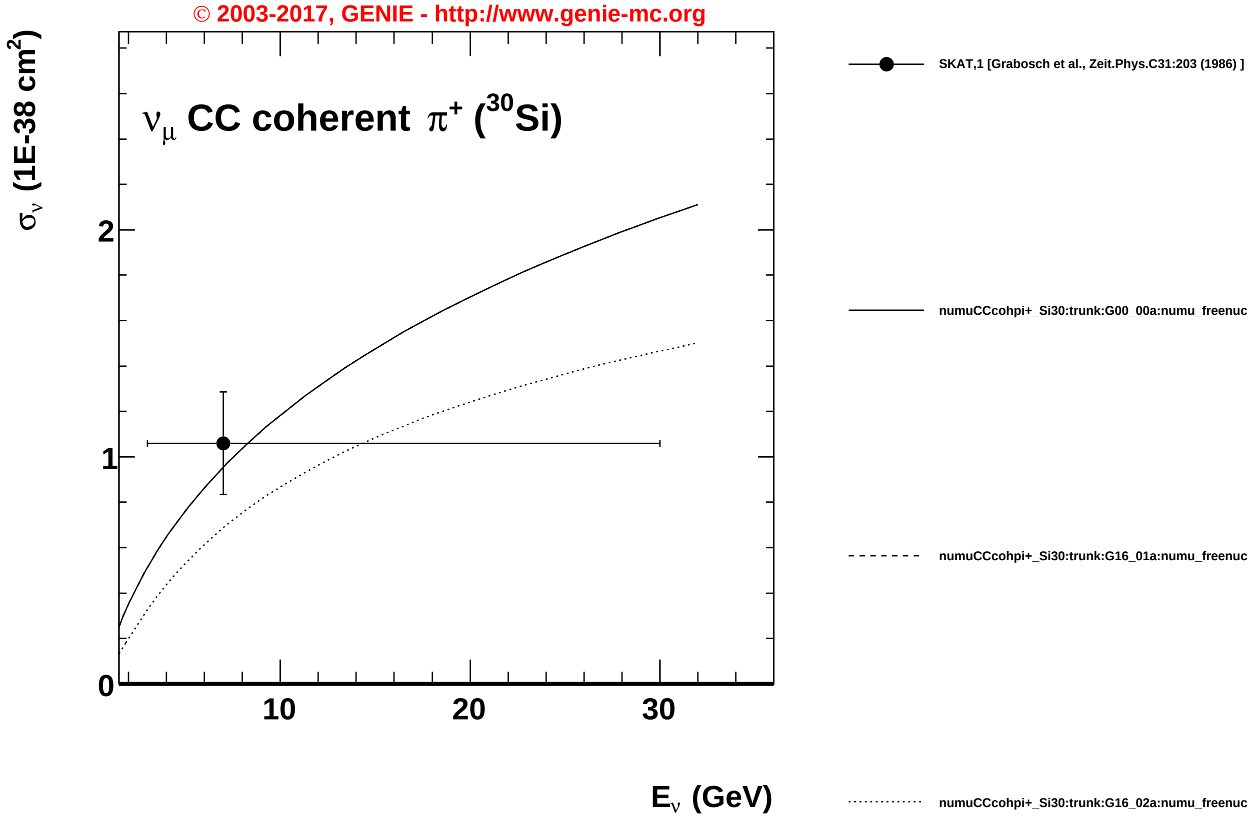
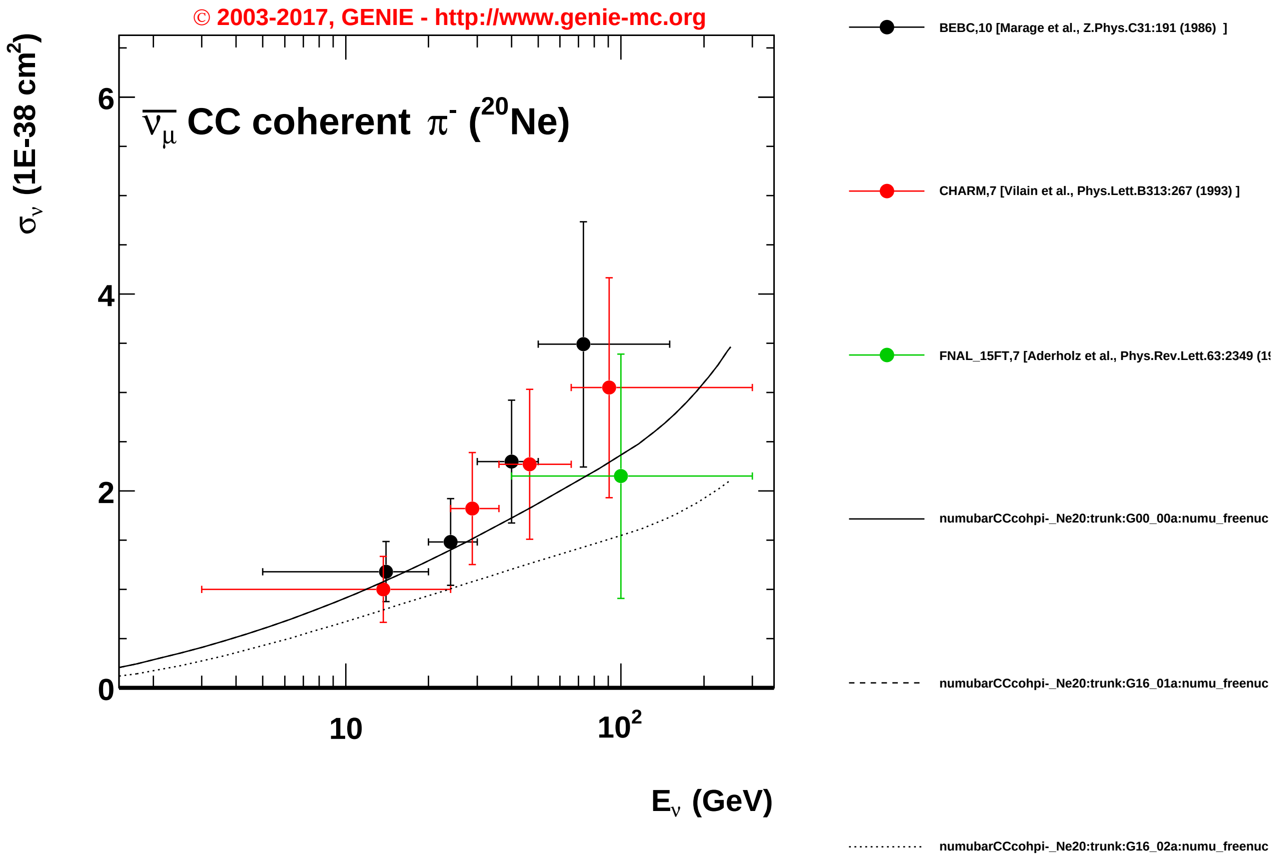
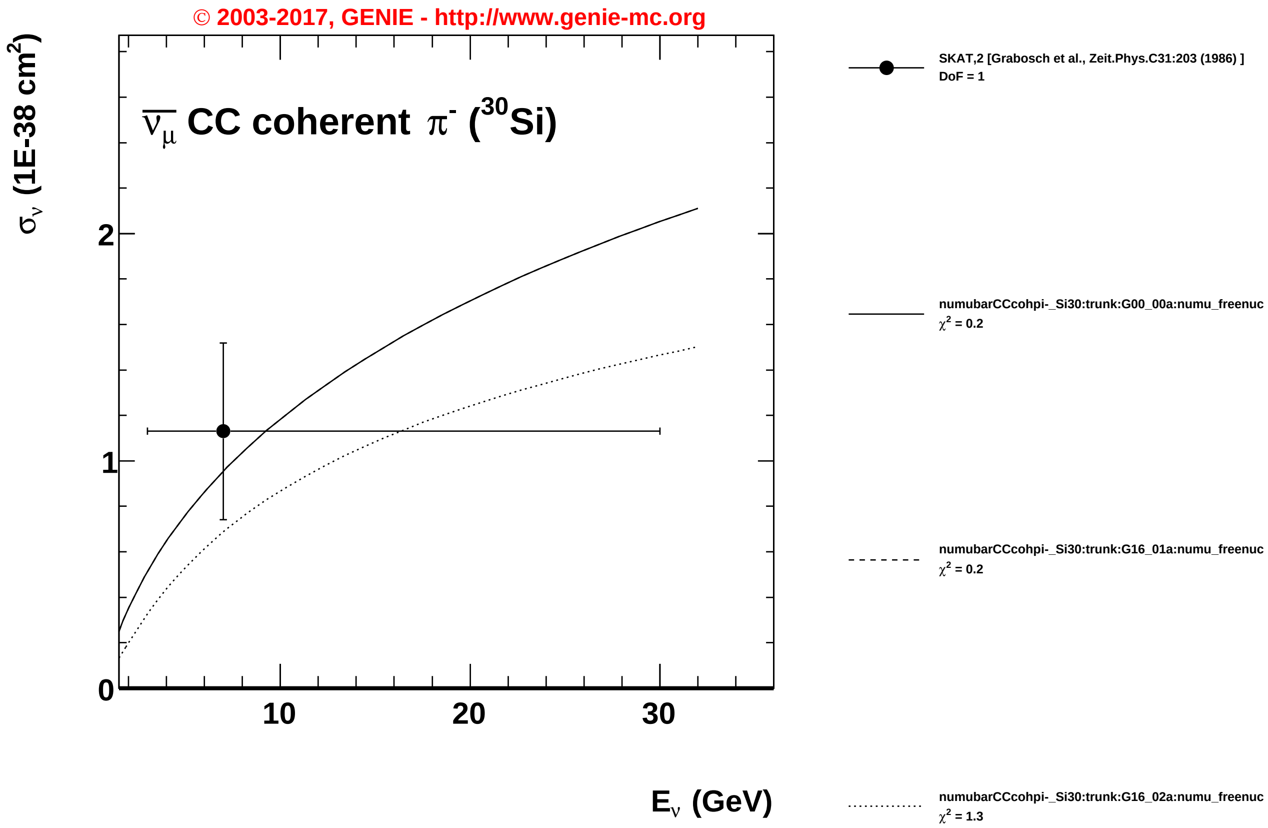
ν_μ CC coherent π^+ (^{20}Ne)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
2
4
6
10
10^2
BEBC,11 [Marage et al., Z.Phys.C43:523 (1989)]
CHARM,6 [Vilain et al., Phys.Lett.B313:267 (1993)]
FNAL_15FT,8 [Willocq et al., Phys.Rev.D47:2661 (1993)
numuCCcohpi+_Ne20:trunk:G00_00a:numu_freenuc
numuCCcohpi+_Ne20:trunk:G16_01a:numu_freenuc
numuCCcohpi+_Ne20:trunk:G16_02a:numu_freenuc


© 2003-2017, GENIE - http://www.genie-mc.org
ν_μ CC coherent π^+ (^{30}Si)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
1
2
10
20
30
SKAT,1 [Grabosch et al., Zeit.Phys.C31:203 (1986)]
numuCCcohpi+_Si30:trunk:G00_00a:numu_freenuc
numuCCcohpi+_Si30:trunk:G16_01a:numu_freenuc
numuCCcohpi+_Si30:trunk:G16_02a:numu_freenuc



© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC coherent π^- (^{20}Ne)
σ_ν (1E-38 cm^2)
E_ν (GeV)
0
2
4
6
10
10^2
BEBC,10 [Marage et al., Z.Phys.C31:191 (1986)]
CHARM,7 [Vilain et al., Phys.Lett.B313:267 (1993)]
FNAL_15FT,7 [Aderholz et al., Phys.Rev.Lett.63:2349 (1
numubarCCcohpi-_Ne20:trunk:G00_00a:numu_freenuc
numubarCCcohpi-_Ne20:trunk:G16_01a:numu_freenuc
numubarCCcohpi-_Ne20:trunk:G16_02a:numu_freenuc



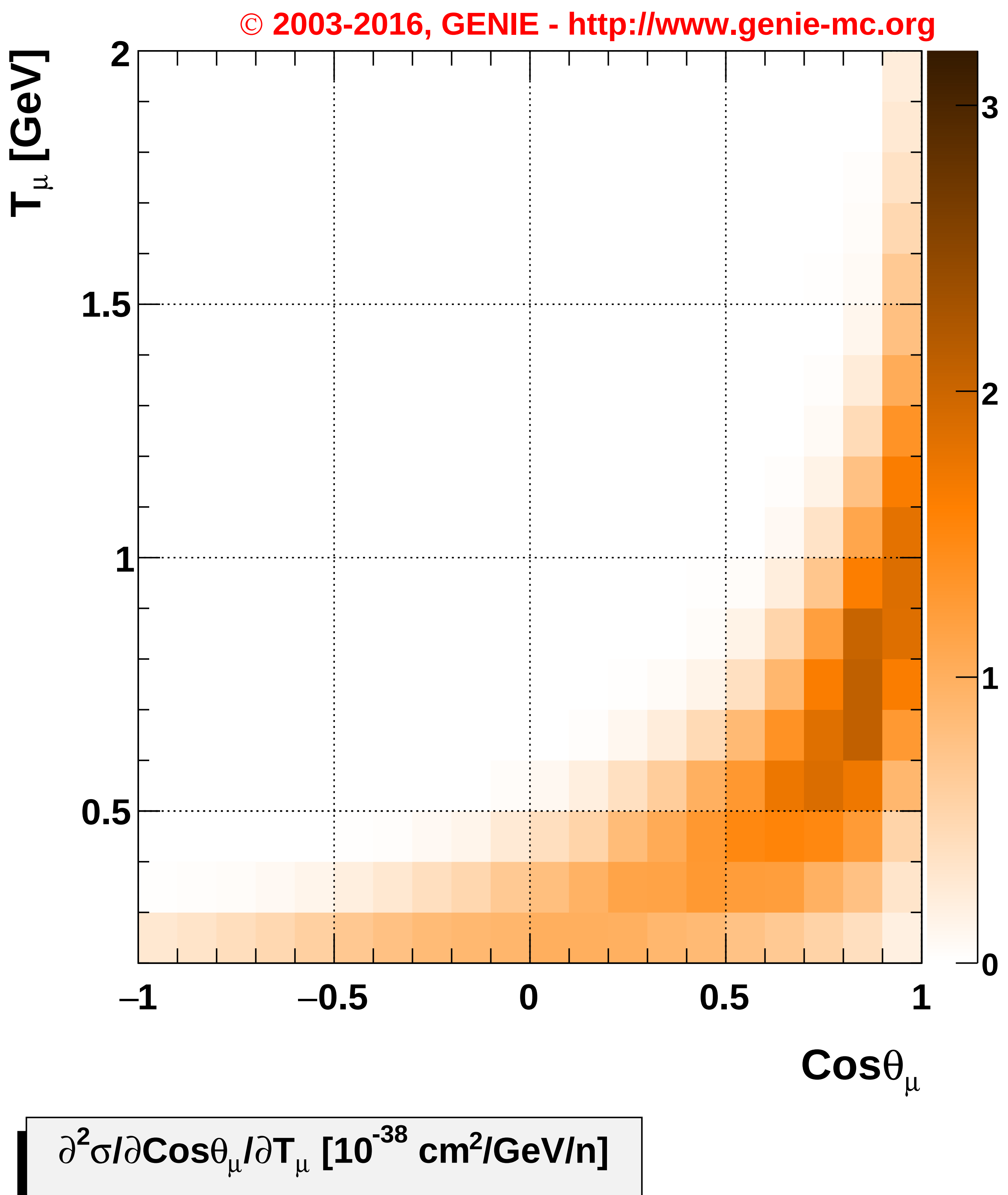
© 2003-2017, GENIE - http://www.genie-mc.org
$\overline{\nu_\mu}$ CC coherent π^- (^{30}Si)
σ_ν (1E-38 cm^2)
0
1
2
10
20
30
E_ν (GeV)
SKAT,2 [Grabosch et al., Zeit.Phys.C31:203 (1986)]
DoF = 1
numubarCCcohpi-_Si30:trunk:G00_00a:numu_freenuc
χ^2 = 0.2
numubarCCcohpi-_Si30:trunk:G16_01a:numu_freenuc
χ^2 = 0.2
numubarCCcohpi-_Si30:trunk:G16_02a:numu_freenuc
χ^2 = 1.3

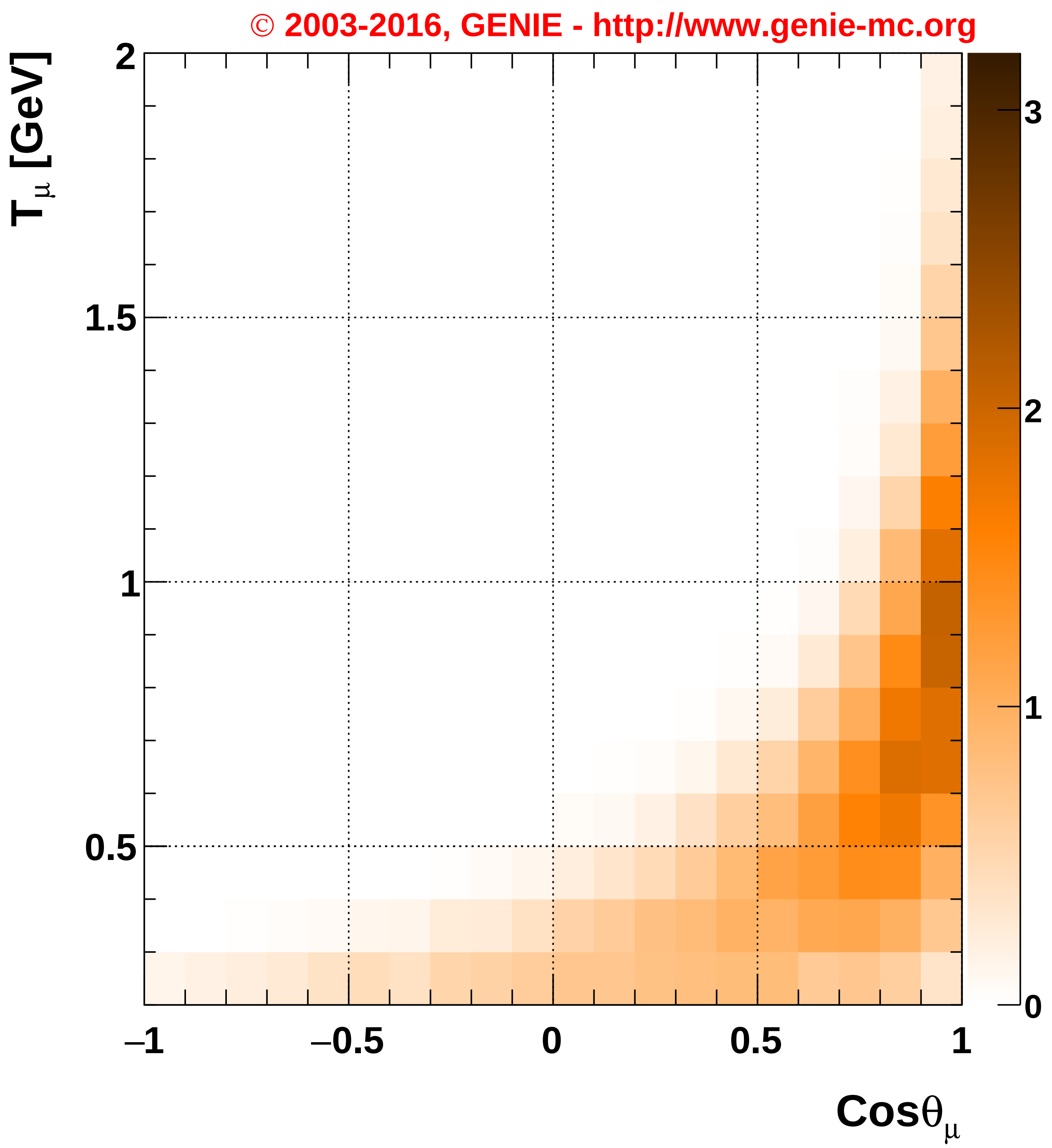
GENIE comparisons with MiniBooNE CC 0π dataset

Dataset:
miniboone_nuccqe_2010

Models:
trunk/G00_00a
trunk/G00_00b
trunk/G16_01a
trunk/G16_02b

2016/11/22 12:29:32


© 2003-2016, GENIE - http://www.genie-mc.org
T_μ [GeV]
2
1.5
1
0.5
–1
–0.5
0
0.5
1
Cosθ_μ
3
2
1
0
∂²σ/∂Cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV/n]
Data: miniboone_nuccqe_2010



$\partial^2\sigma/\partial\mathrm{Cos}\theta_\mu/\partial T_\mu$ [10^{-38} cm²/GeV/n]

Pred: trunk:G00_00a:miniboone_fhc

miniboone_nuccqe_2010

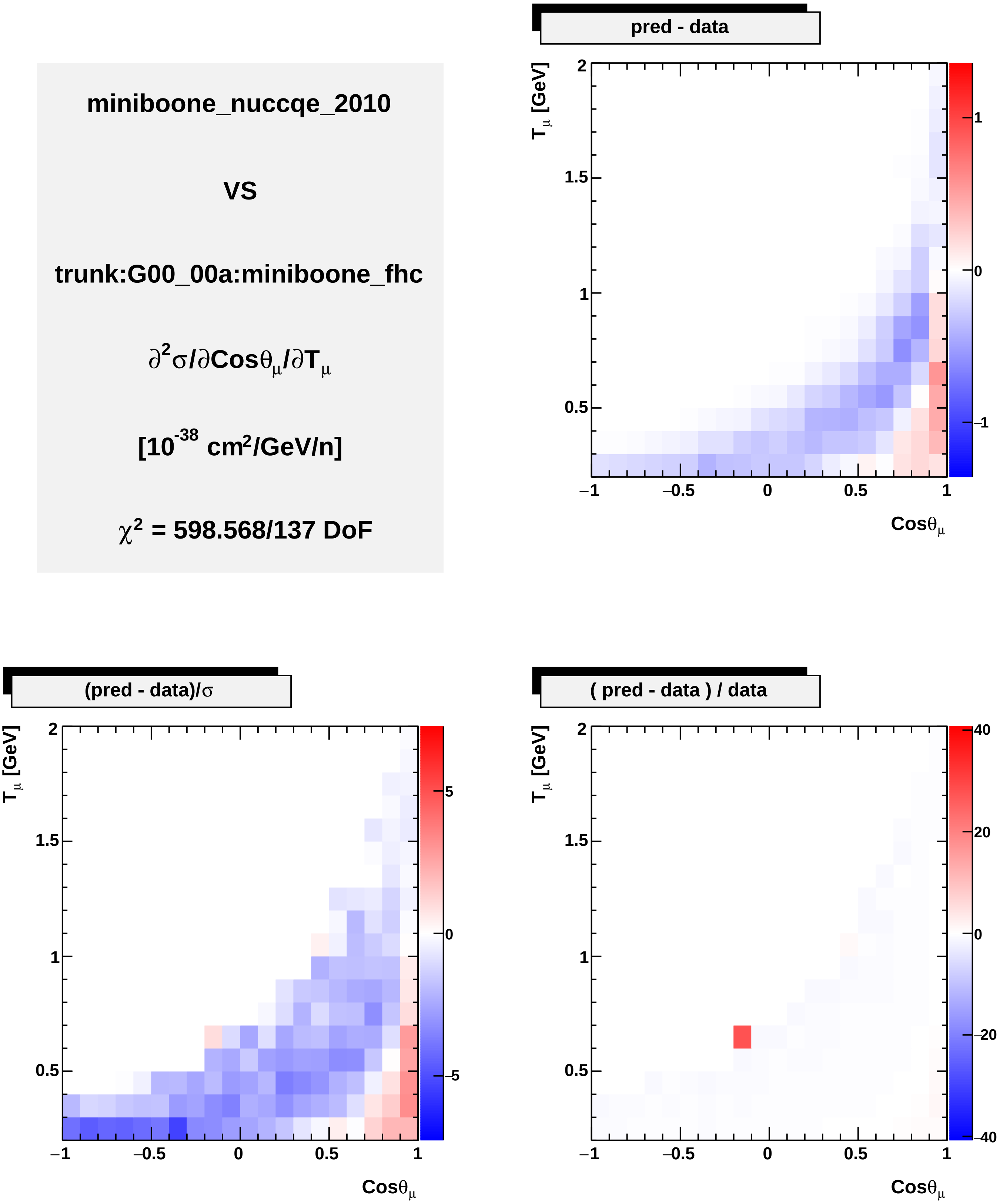
VS

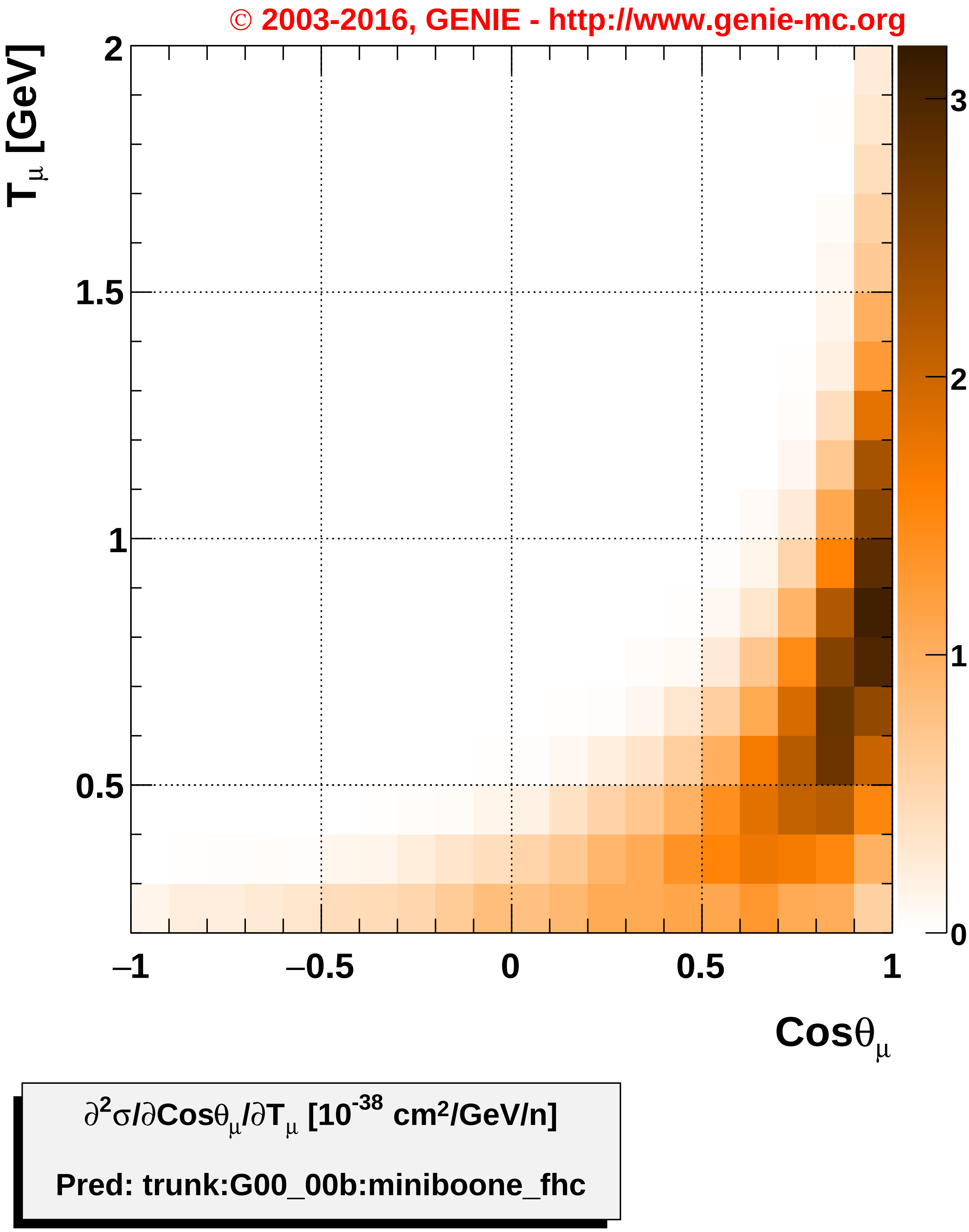
trunk:G00_00a:miniboone_fhc

$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$

$[10^{-38}\ cm^2/GeV/n]$

χ^2 = 598.568/137 DoF





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T_μ [GeV]
2
1.5
1
0.5
–1
–0.5
0
0.5
1
$\text{Cos}\theta_\mu$
3
2
1
0
$\partial^2\sigma/\partial\text{Cos}\theta_\mu/\partial T_\mu$ [10^{-38} cm²/GeV/n]
Pred: trunk:G00_00b:miniboone_fhc

miniboone_nuccqe_2010

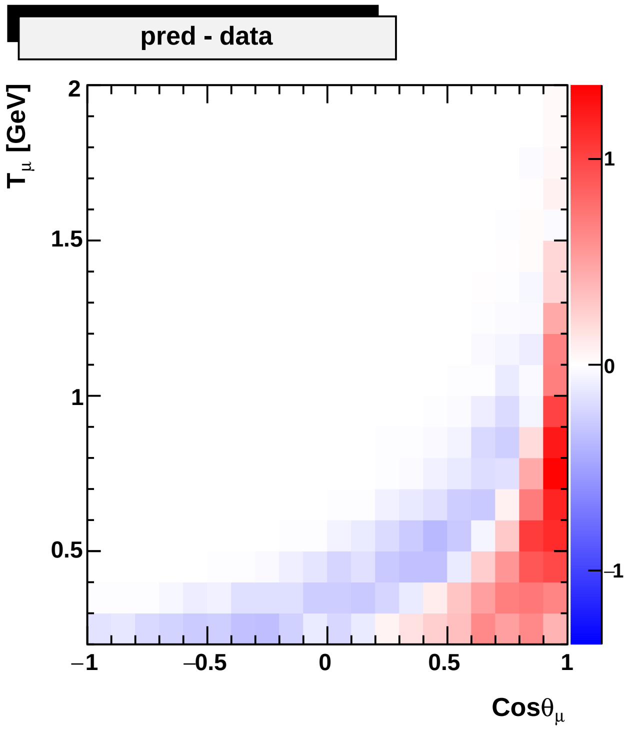
VS

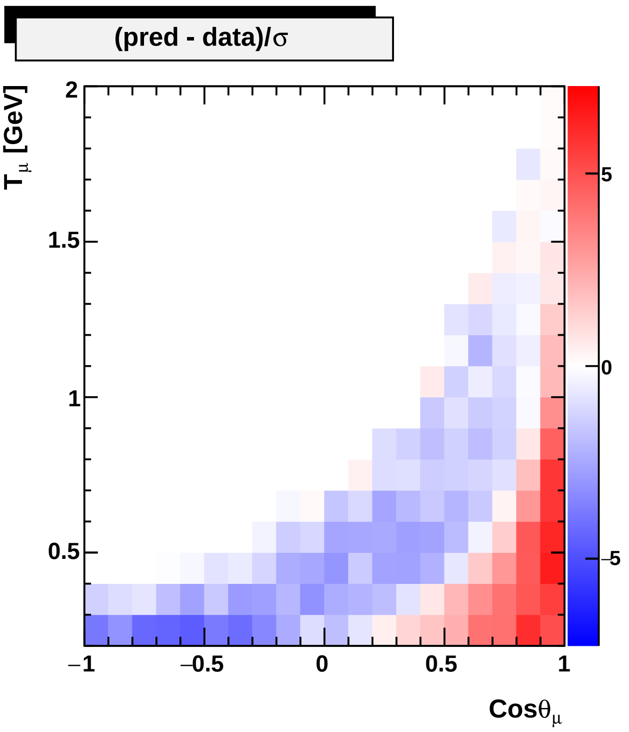
trunk:G00_00b:miniboone_fhc

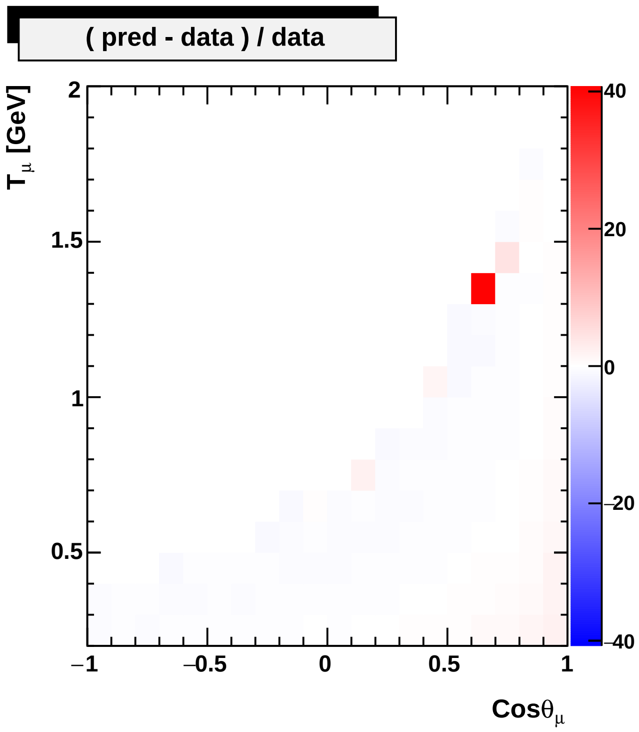
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$

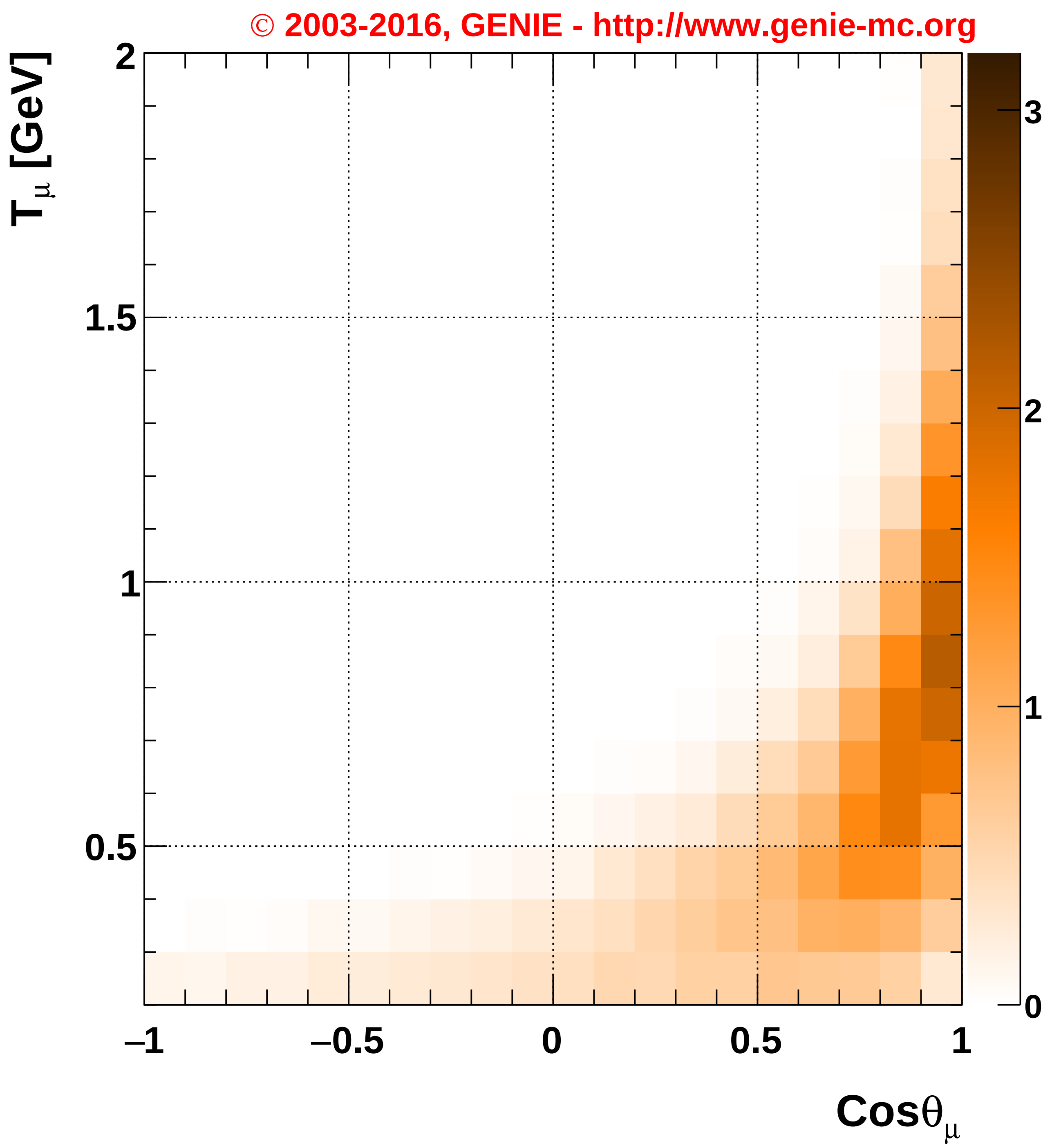
$[10^{-38}\ cm^2/GeV/n]$

χ^2 = 794.689/137 DoF









$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm²/GeV/n]

Pred: trunk:G16_01a:miniboone_fhc

miniboone_nuccqe_2010

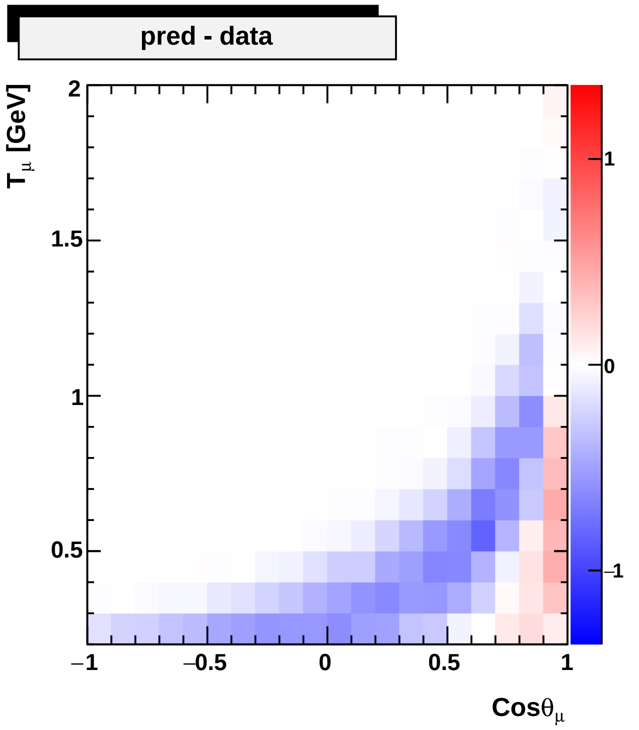
VS

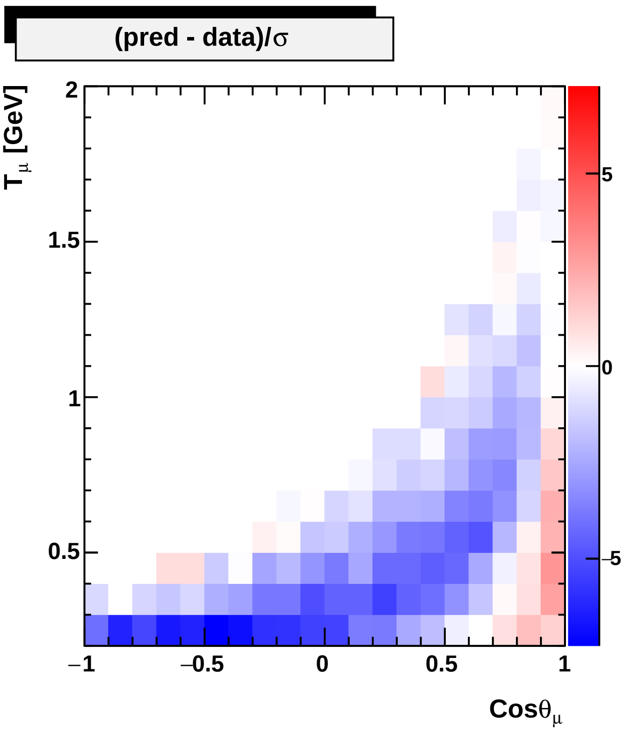
trunk:G16_01a:miniboone_fhc

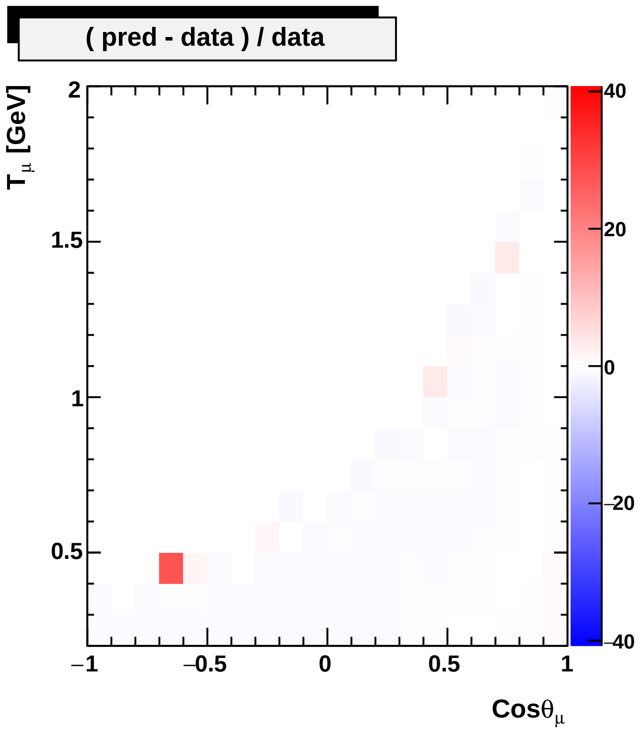
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$

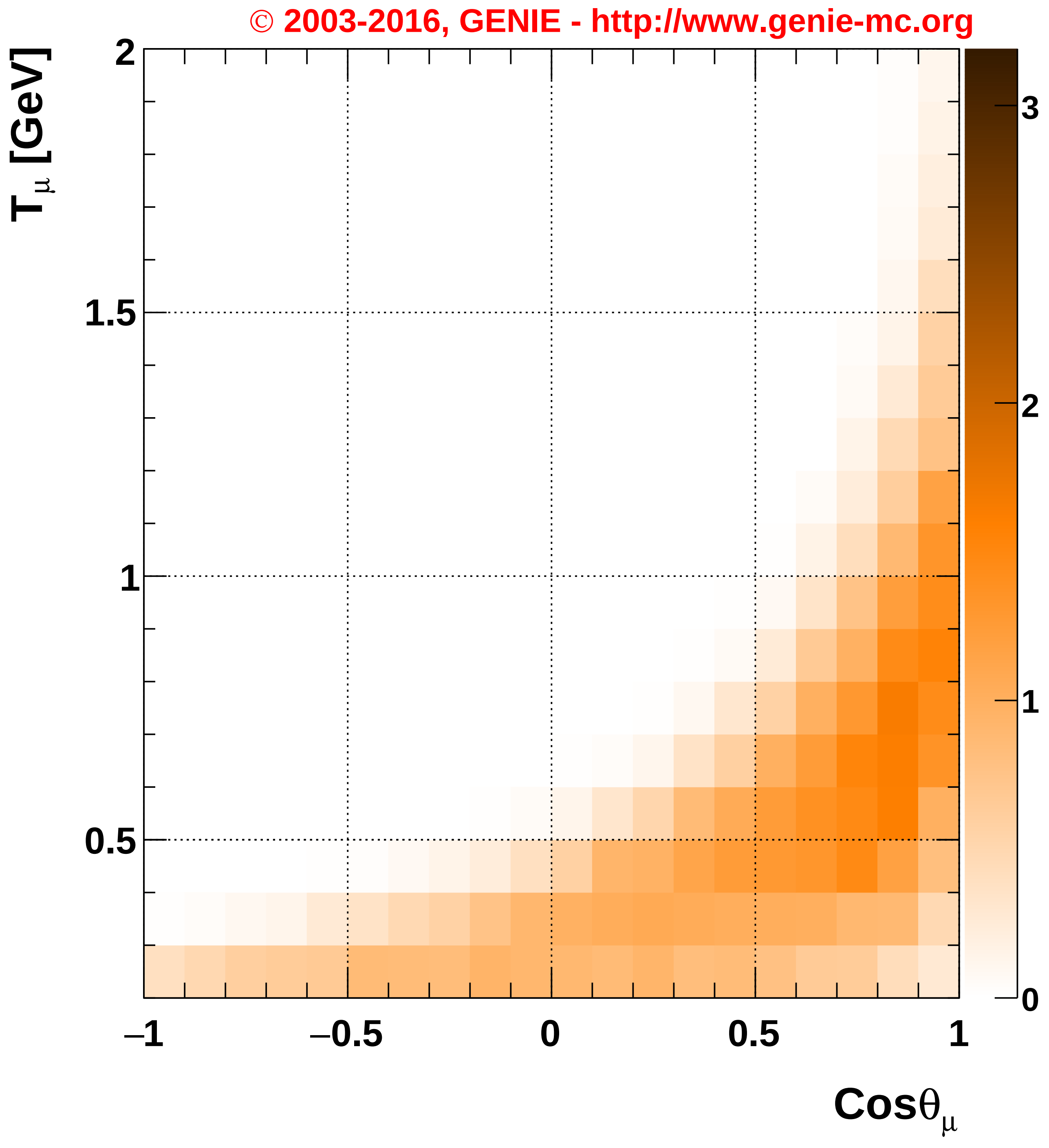
$[10^{-38}\ cm^2/GeV/n]$

χ^2 = 1023.42/137 DoF









$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm²/GeV/n]

Pred: trunk:G16_02b:miniboone_fhc

miniboone_nuccqe_2010

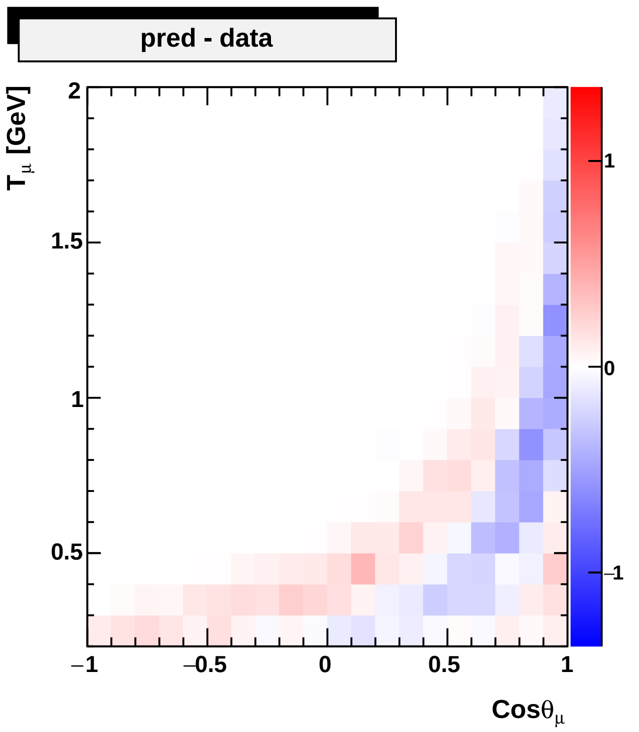
VS

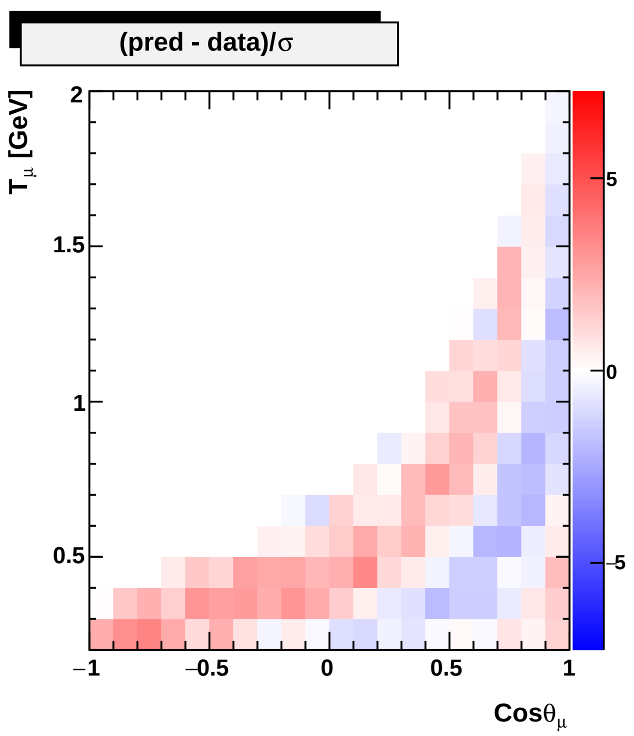
trunk:G16_02b:miniboone_fhc

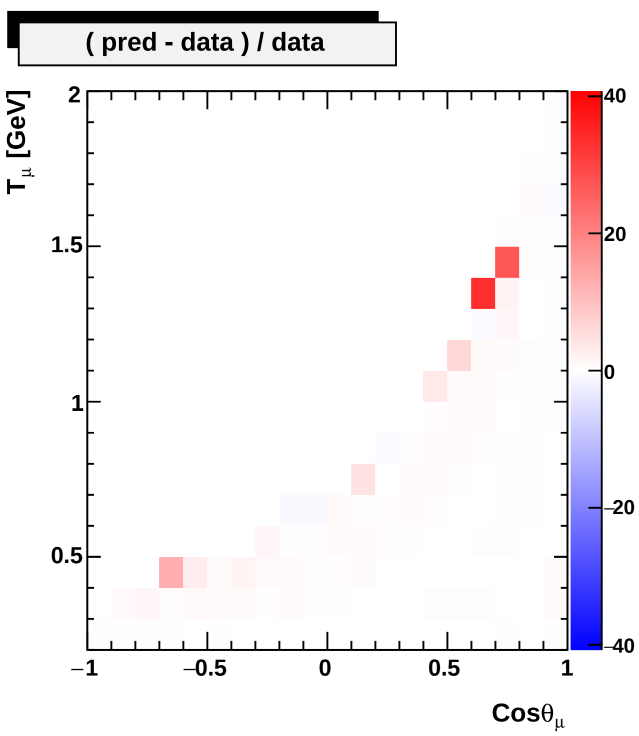
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$

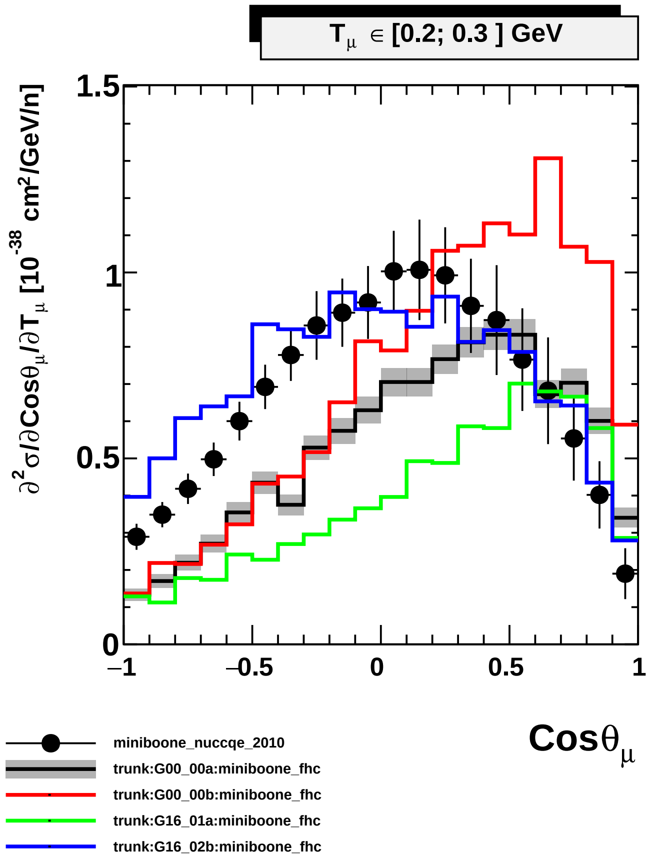
$[10^{-38}\ cm^2/GeV/n]$

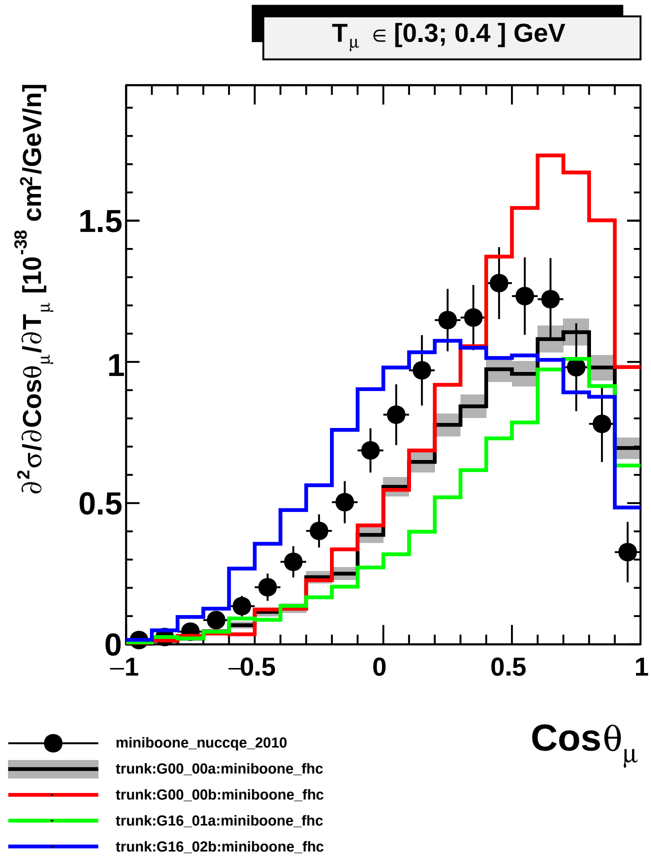
χ^2 = 298.857/137 DoF

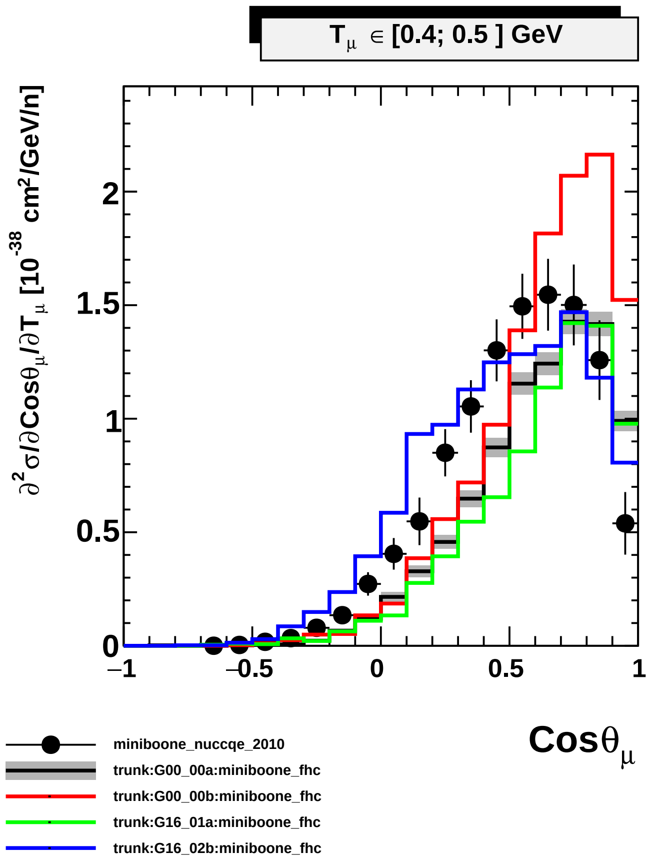


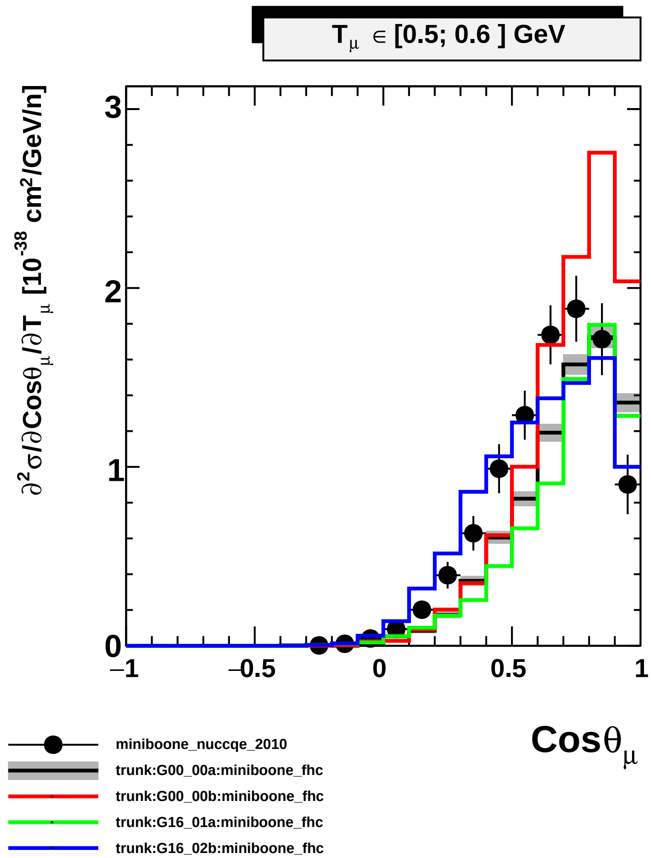


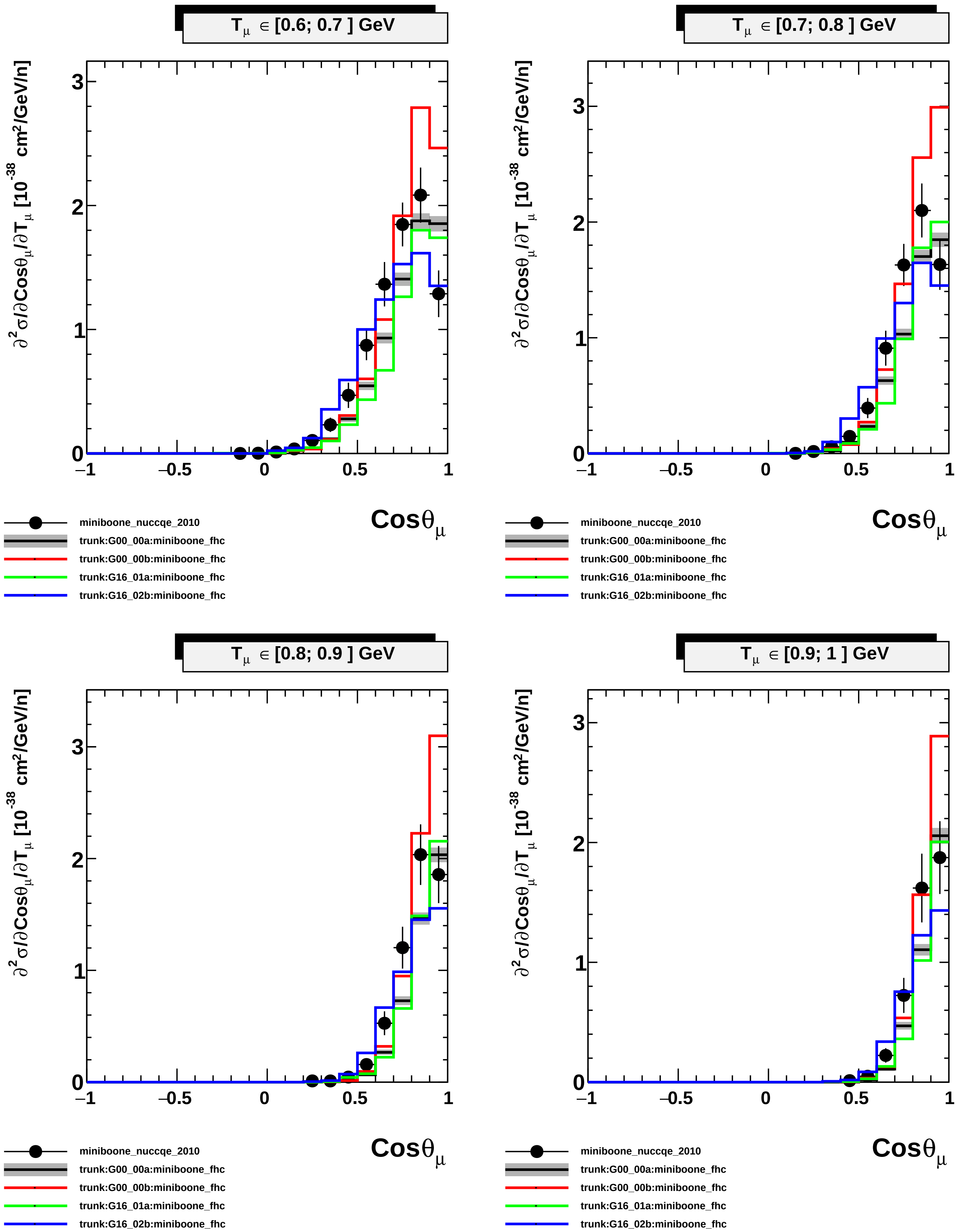



T_μ ∈ [0.2; 0.3] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV/n]
Cosθ_μ
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

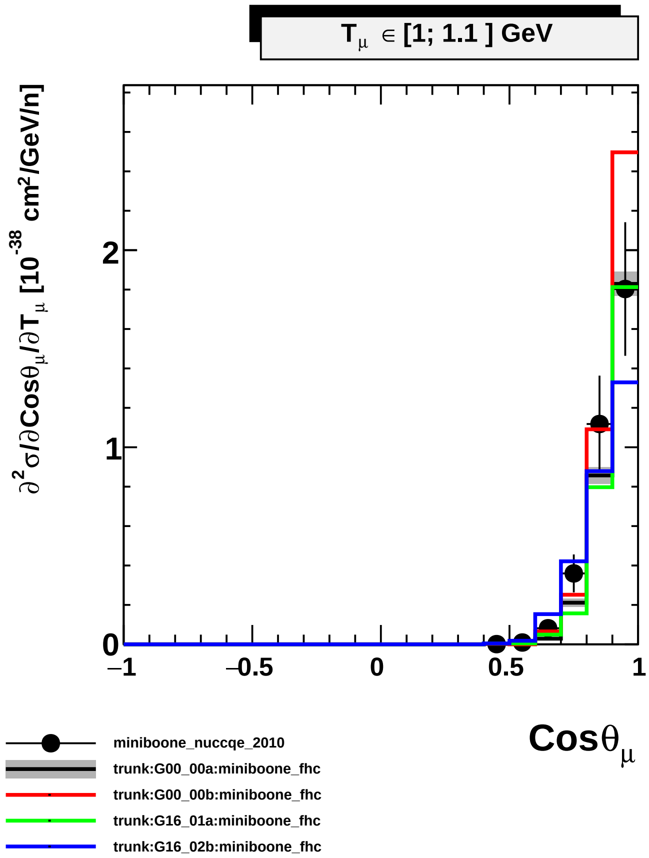

T_μ ∈ [0.3; 0.4] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV/n]
Cosθ_μ
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


T_μ ∈ [0.4; 0.5] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV/n]
Cosθ_μ
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

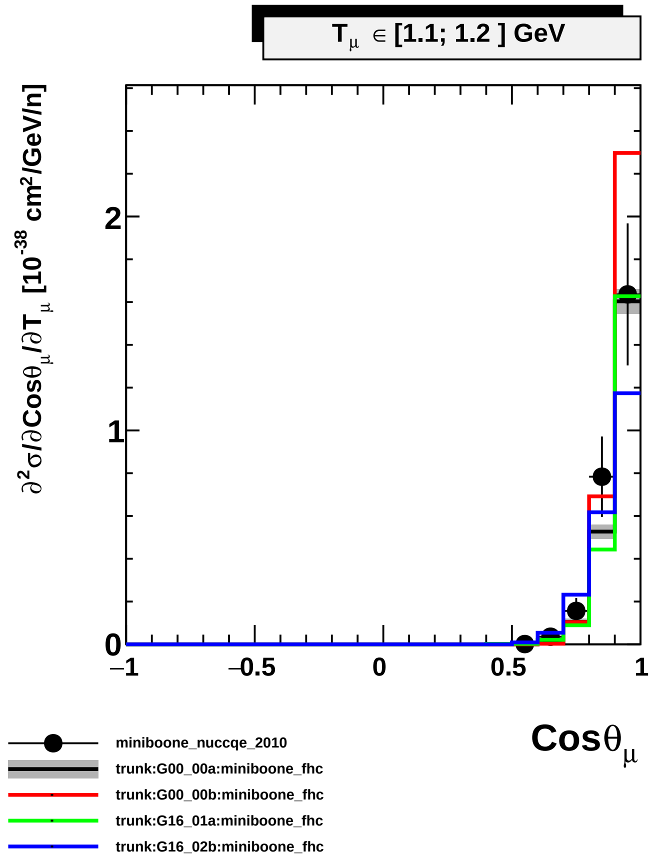

T_μ ∈ [0.5; 0.6] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV/n]
Cosθ_μ
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



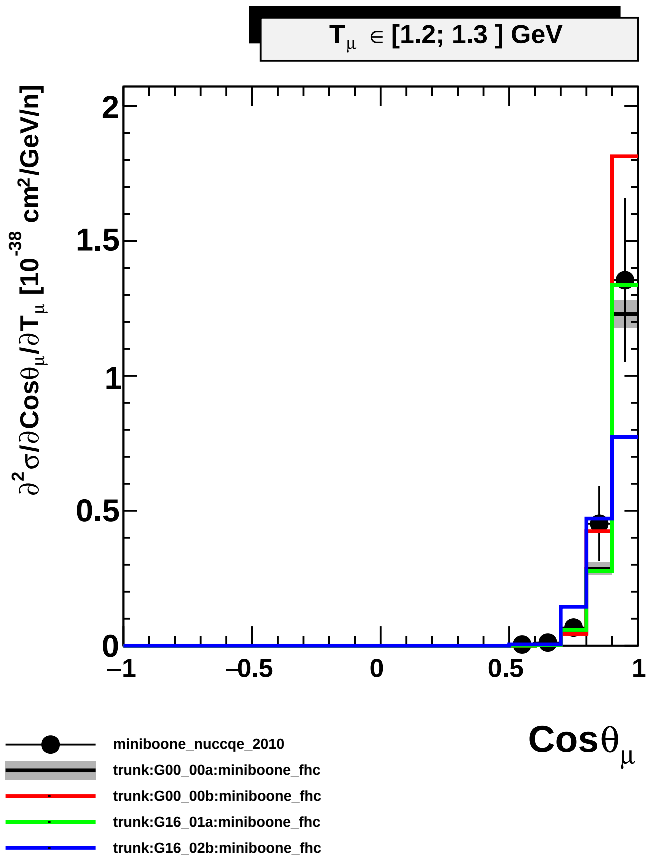
T_μ ∈ [0.6; 0.7] GeV
T_μ ∈ [0.7; 0.8] GeV
T_μ ∈ [0.8; 0.9] GeV
T_μ ∈ [0.9; 1] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
Cosθ_μ
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



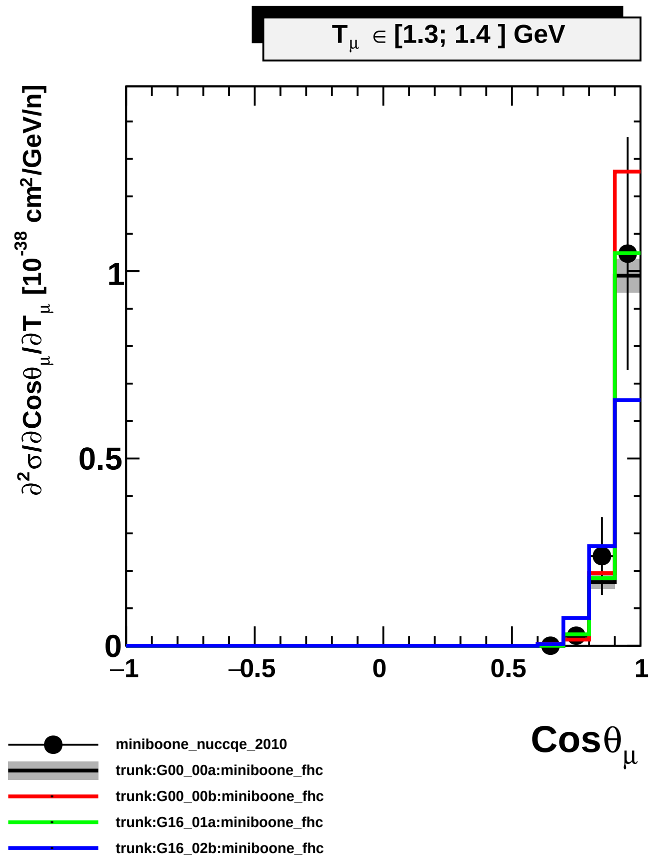
$T_{\mu} \in [1; 1.1]$ GeV
$\partial^2\sigma/\partial Cos\theta_{\mu}/\partial T_{\mu}$ [10^{-38} cm^2/GeV/n]
$Cos\theta_{\mu}$
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



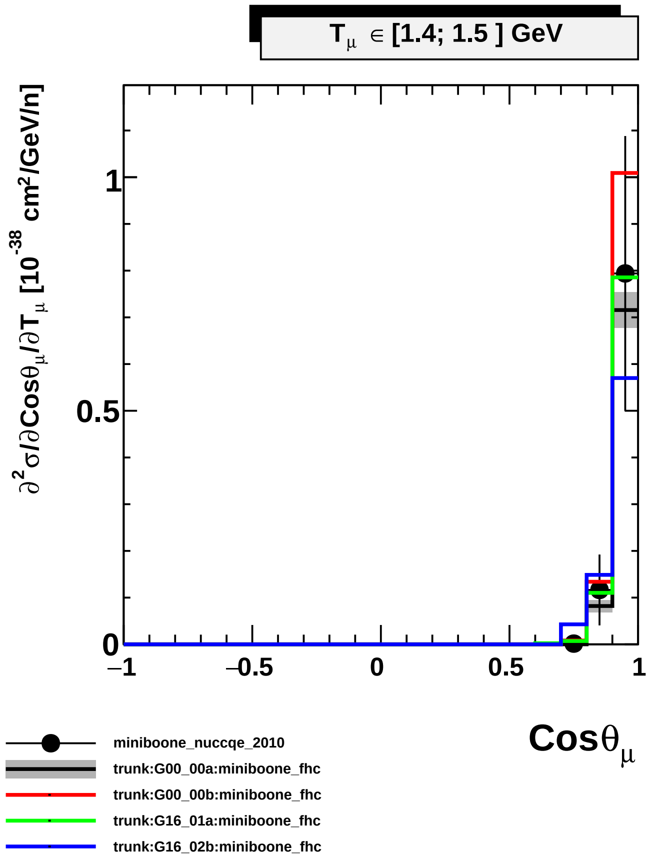
$T_{\mu} \in [1.1; 1.2]$ GeV
$\partial^2\sigma/\partial Cos\theta_{\mu}/\partial T_{\mu}$ [10^{-38} cm^2/GeV/n]
$Cos\theta_{\mu}$
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

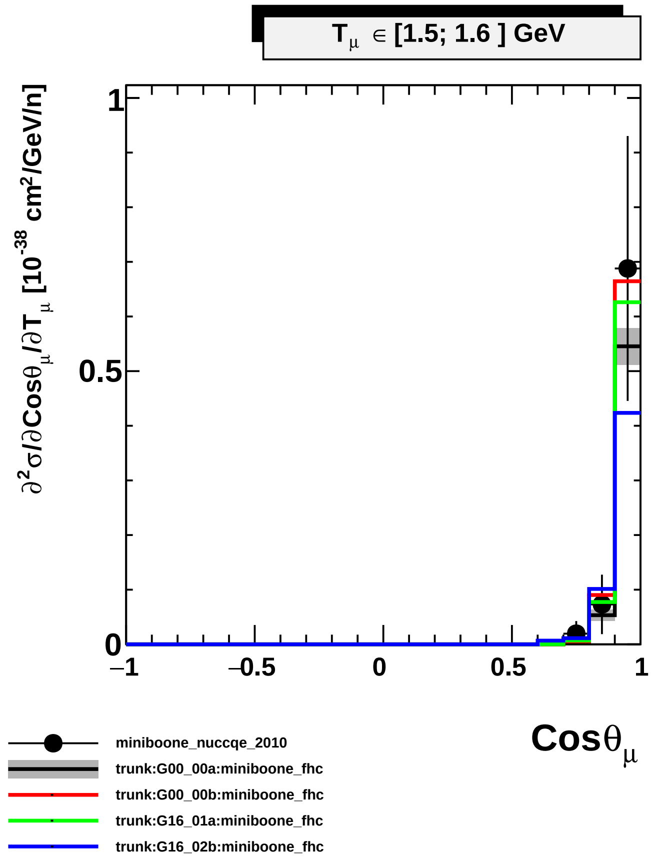


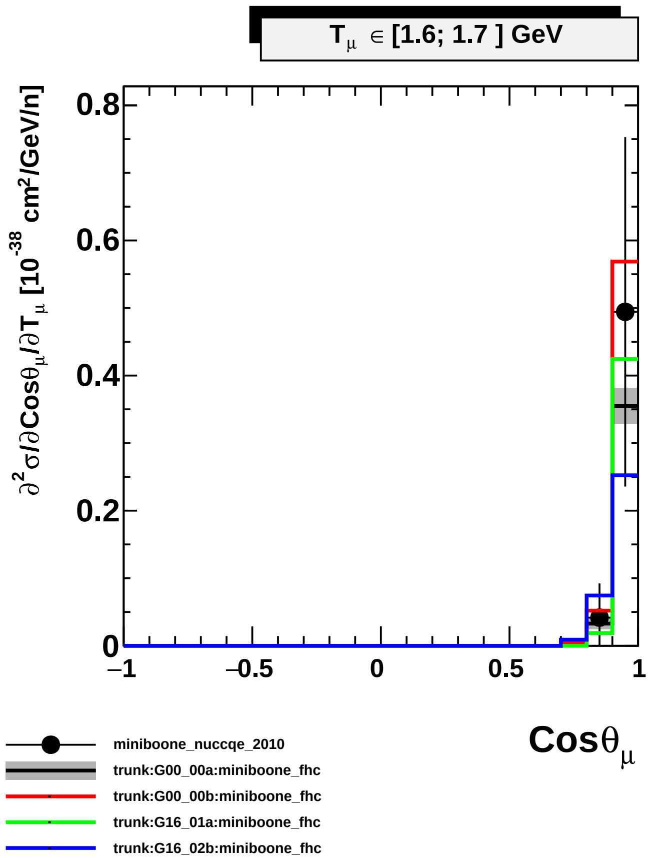
$T_{\mu} \in [1.2; 1.3]$ GeV
$\partial^2\sigma/\partial Cos\theta_{\mu}/\partial T_{\mu}$ [10^{-38} cm^2/GeV/n]
$Cos\theta_{\mu}$
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

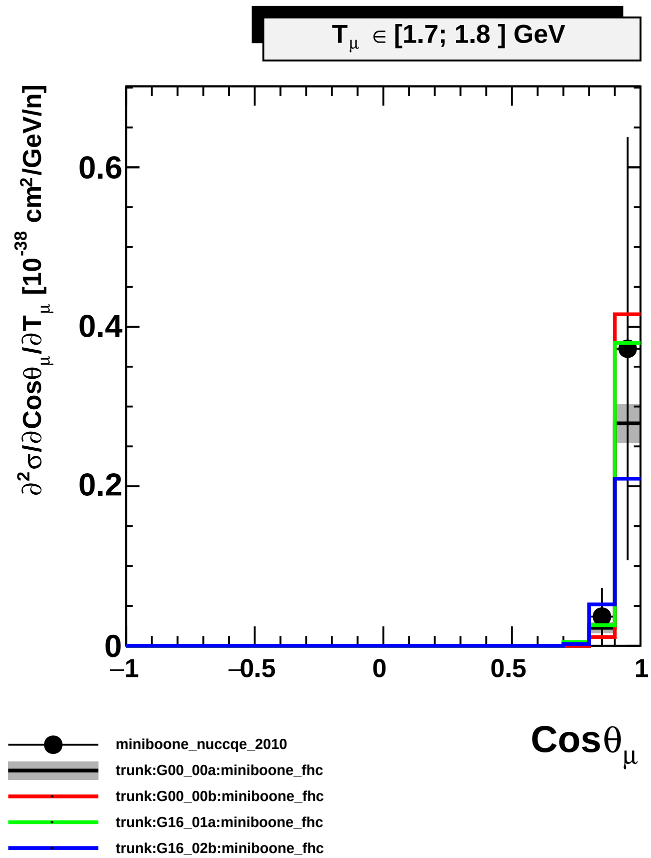


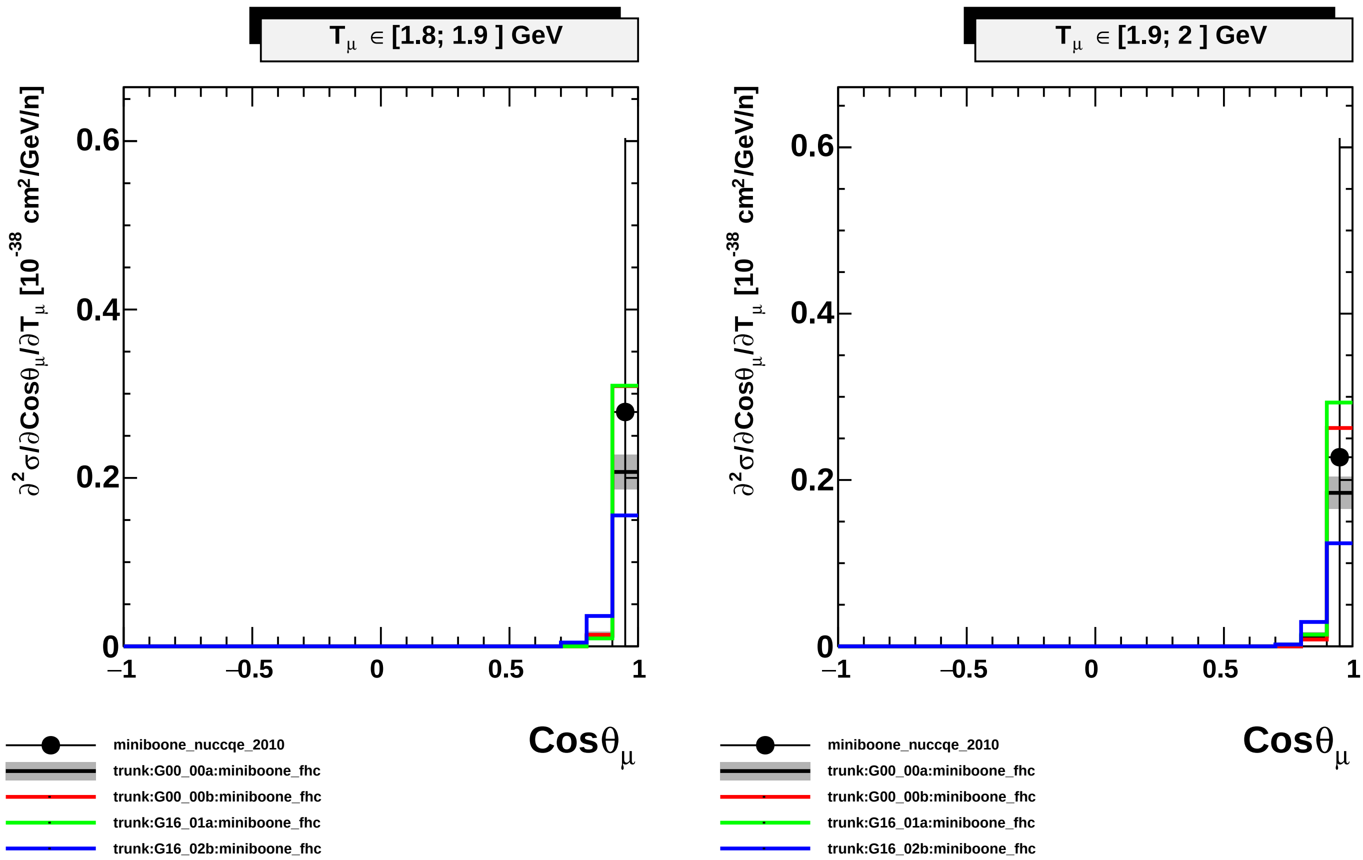
$T_{\mu} \in [1.3; 1.4]$ GeV
$\partial^2\sigma/\partial Cos\theta_{\mu}/\partial T_{\mu}$ [10^{-38} cm^2/GeV/n]
$Cos\theta_{\mu}$
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$T_{\mu} \in$ [1.4; 1.5] GeV
$\partial^{2}\sigma/\partial Cos\theta_{\mu}/\partial T_{\mu}$ [10^{-38} cm^{2}/GeV/n]
$Cos\theta_{\mu}$
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

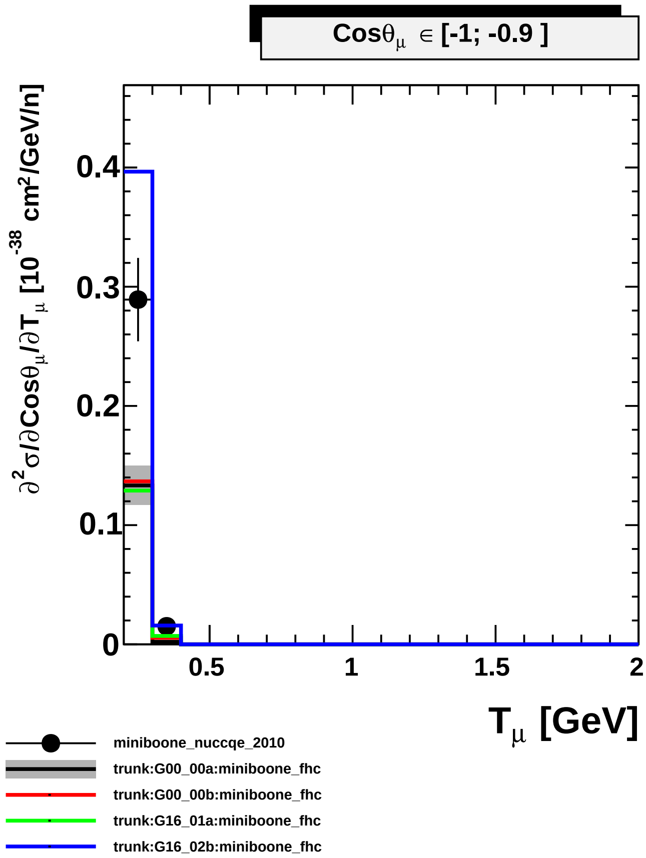

$T_{\mu} \in$ [1.5; 1.6] GeV
$\partial^{2}\sigma/\partial Cos\theta_{\mu}/\partial T_{\mu}$ [10^{-38} cm^{2}/GeV/n]
$Cos\theta_{\mu}$
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$T_{\mu} \in$ [1.6; 1.7] GeV
$\partial^{2}\sigma/\partial Cos\theta_{\mu}/\partial T_{\mu}$ [10^{-38} cm^{2}/GeV/n]
$Cos\theta_{\mu}$
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

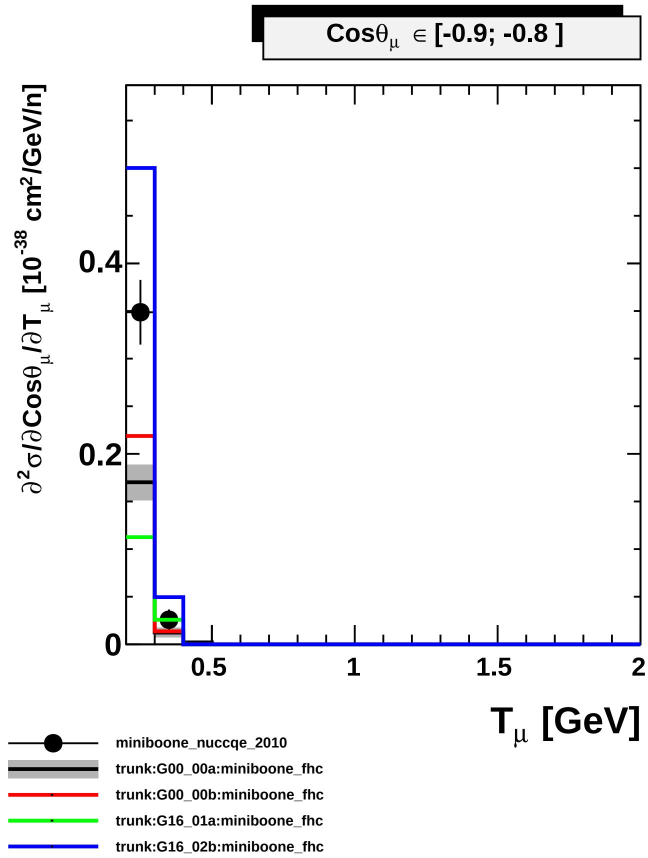

$T_{\mu} \in$ [1.7; 1.8] GeV
$\partial^{2}\sigma/\partial Cos\theta_{\mu}/\partial T_{\mu}$ [10^{-38} cm^{2}/GeV/n]
$Cos\theta_{\mu}$
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



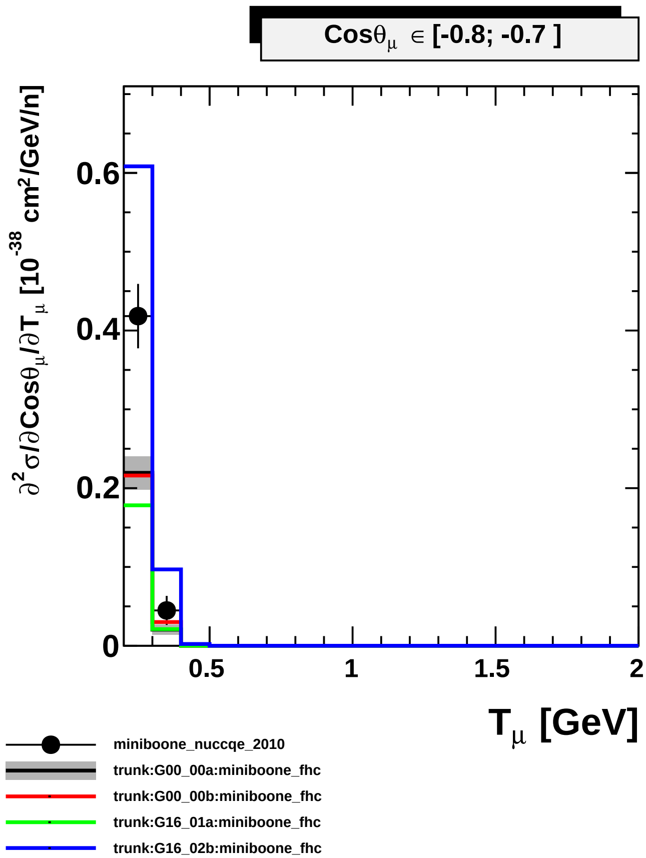
$T_\mu \in$ [1.8; 1.9] GeV
$T_\mu \in$ [1.9; 2] GeV
$\partial^2\sigma/\partial\mathrm{Cos}\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
0
0.2
0.4
0.6
–1
–0.5
0
0.5
1
$\mathrm{Cos}\theta_\mu$
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



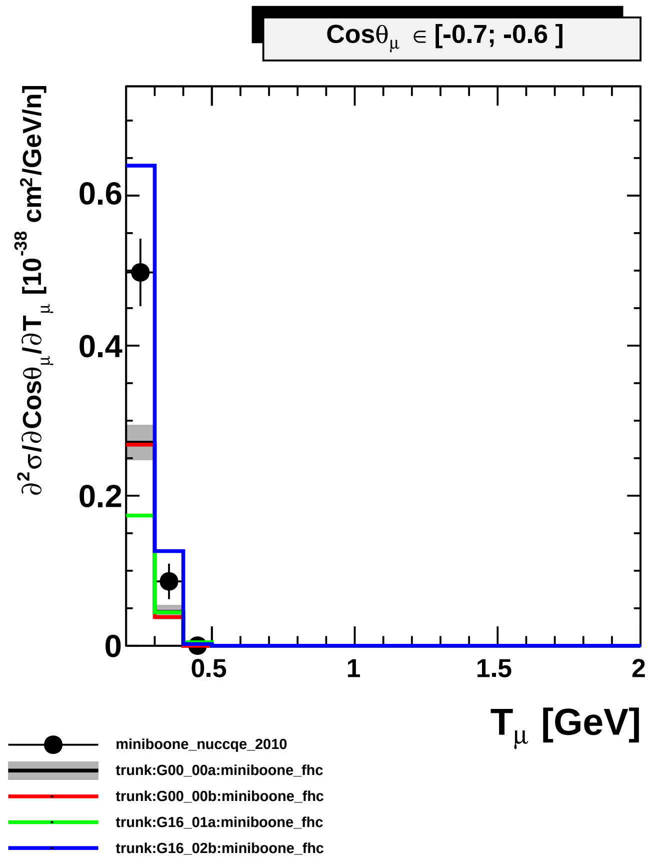
Cos$\theta_\mu \in$ [-1; -0.9]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
T_μ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



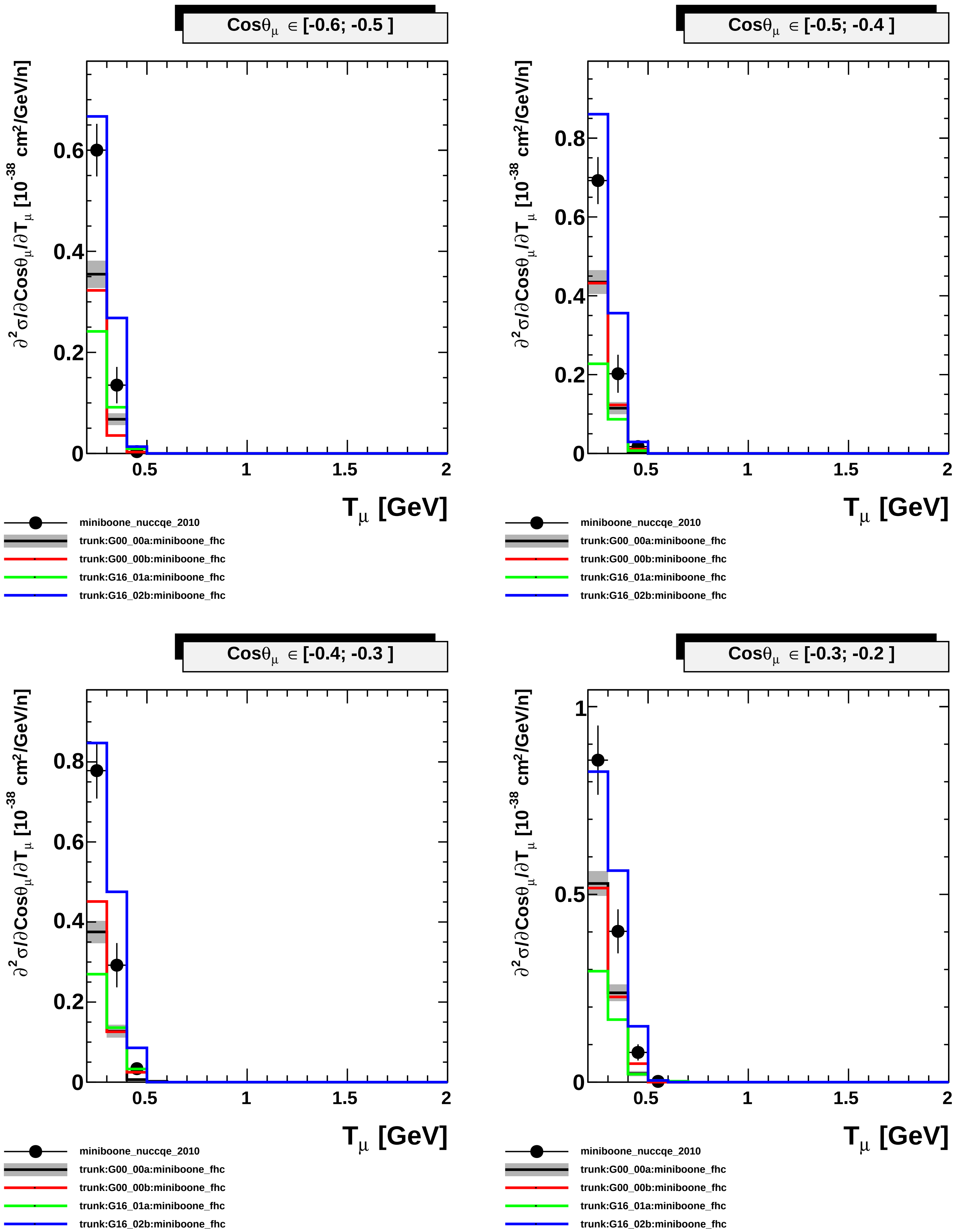
Cos$\theta_\mu \in$ [-0.9; -0.8]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
T_μ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



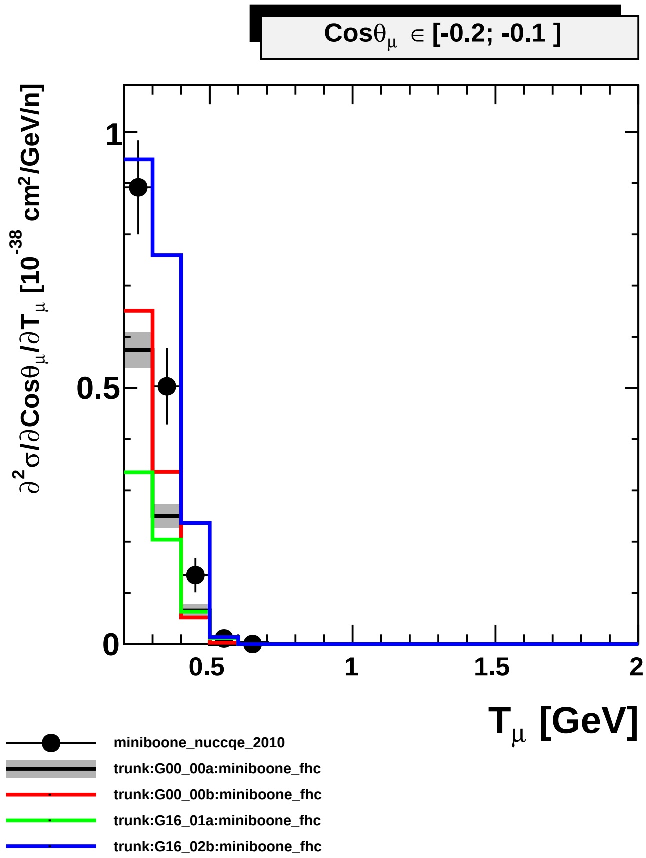
Cos$\theta_\mu \in$ [-0.8; -0.7]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
T_μ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



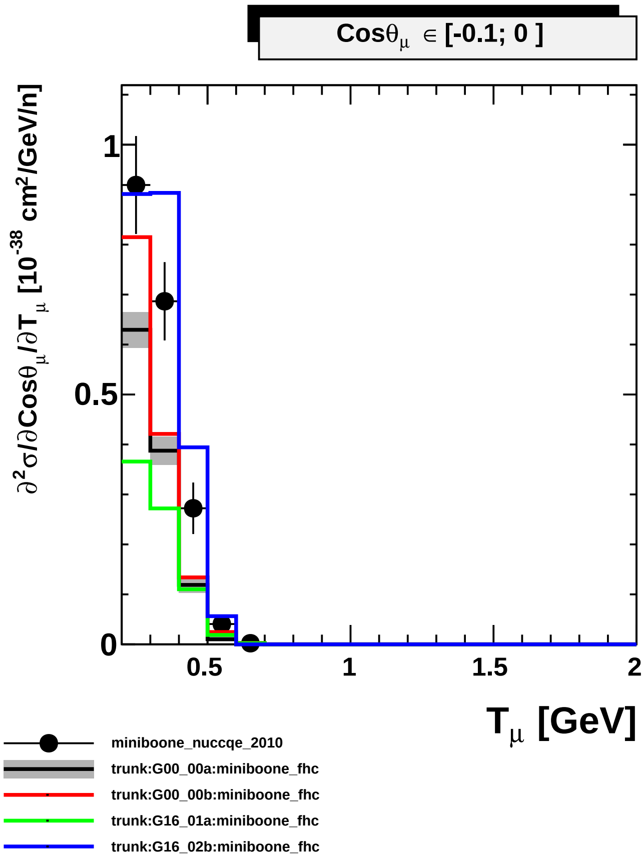
Cos$\theta_\mu \in$ [-0.7; -0.6]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
T_μ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



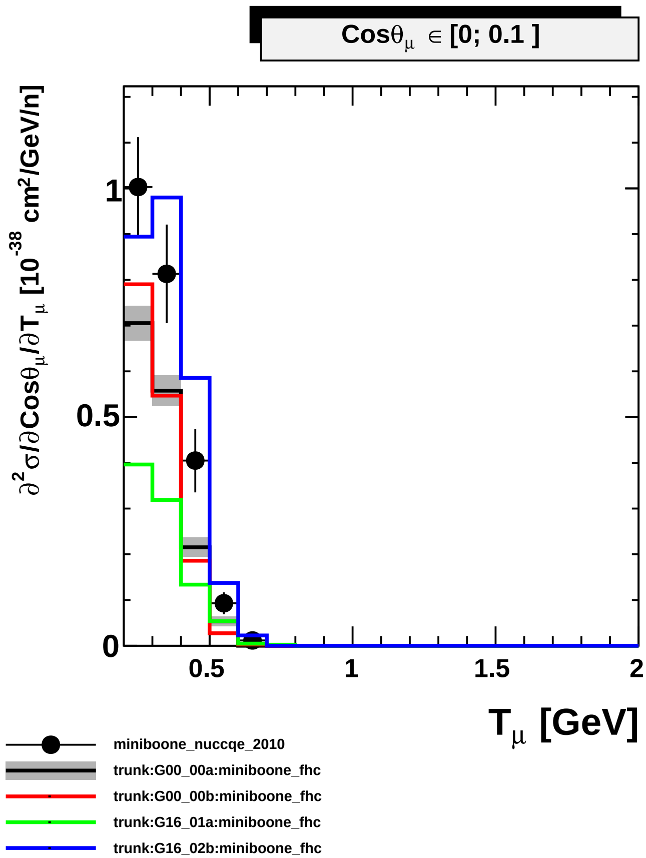
Cosθμ ∈ [-0.6; -0.5]
Cosθμ ∈ [-0.5; -0.4]
Cosθμ ∈ [-0.4; -0.3]
Cosθμ ∈ [-0.3; -0.2]
∂²σ/∂Cosθμ/∂Tμ [10⁻³⁸ cm²/GeV/n]
Tμ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



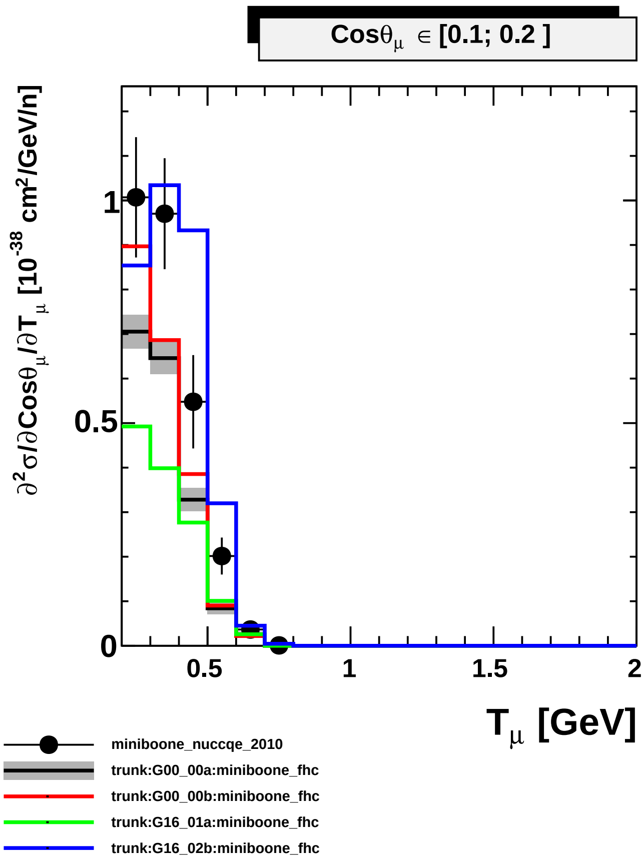
Cosθ$_\mu$ ∈ [-0.2; -0.1]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
T$_\mu$ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



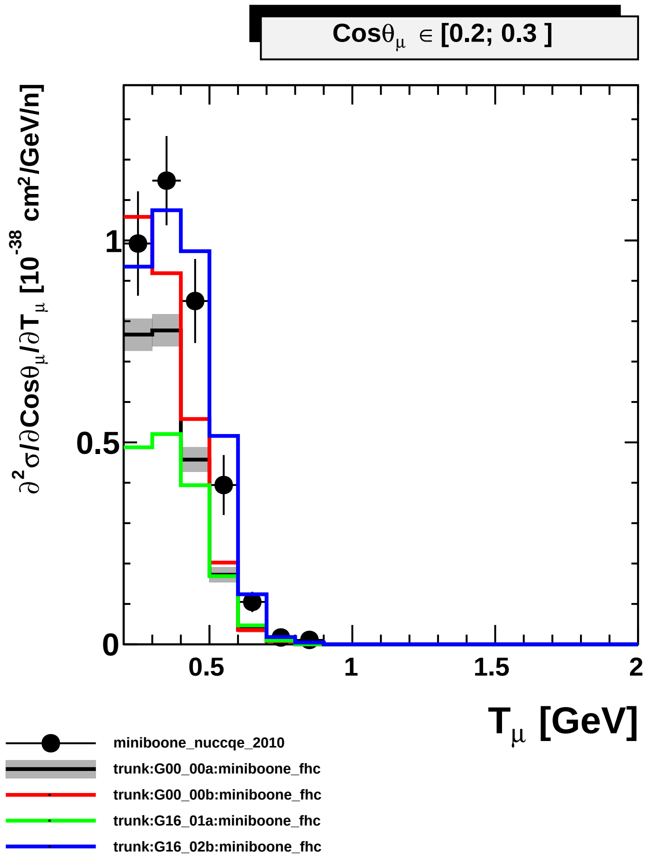
Cosθ$_\mu$ ∈ [-0.1; 0]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
T$_\mu$ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



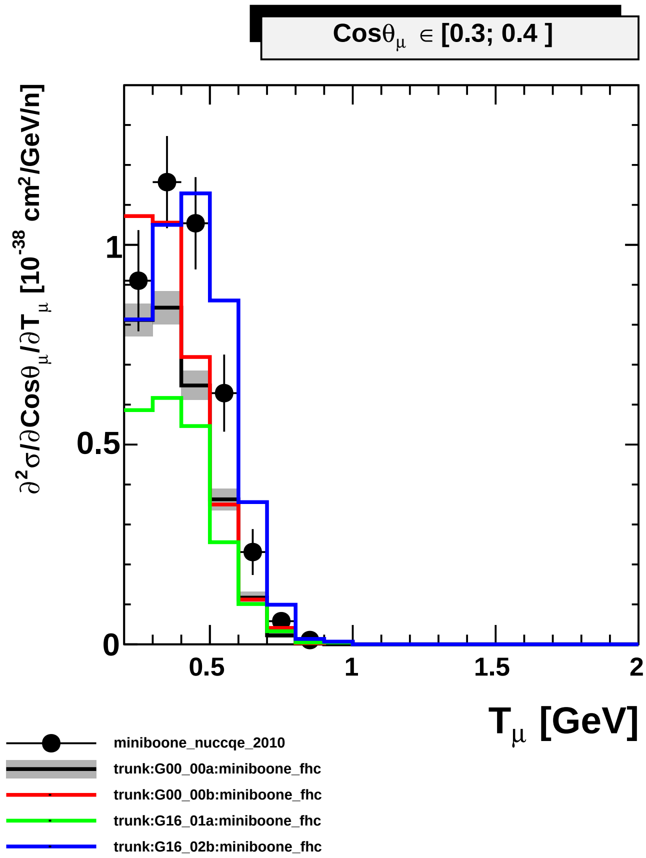
Cosθ$_\mu$ ∈ [0; 0.1]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
T$_\mu$ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



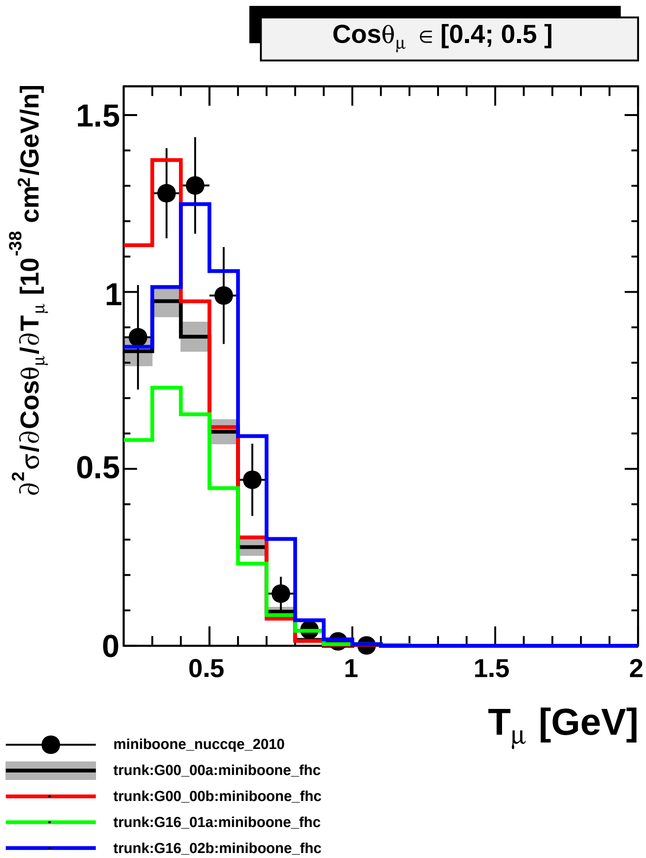
Cosθ$_\mu$ ∈ [0.1; 0.2]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
T$_\mu$ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



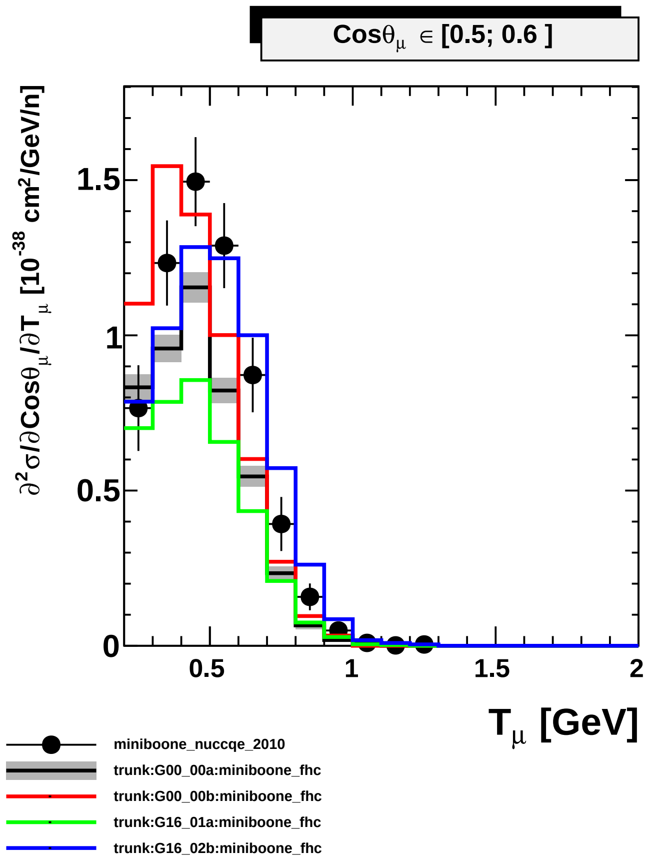
Cosθ_μ ∈ [0.2; 0.3]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



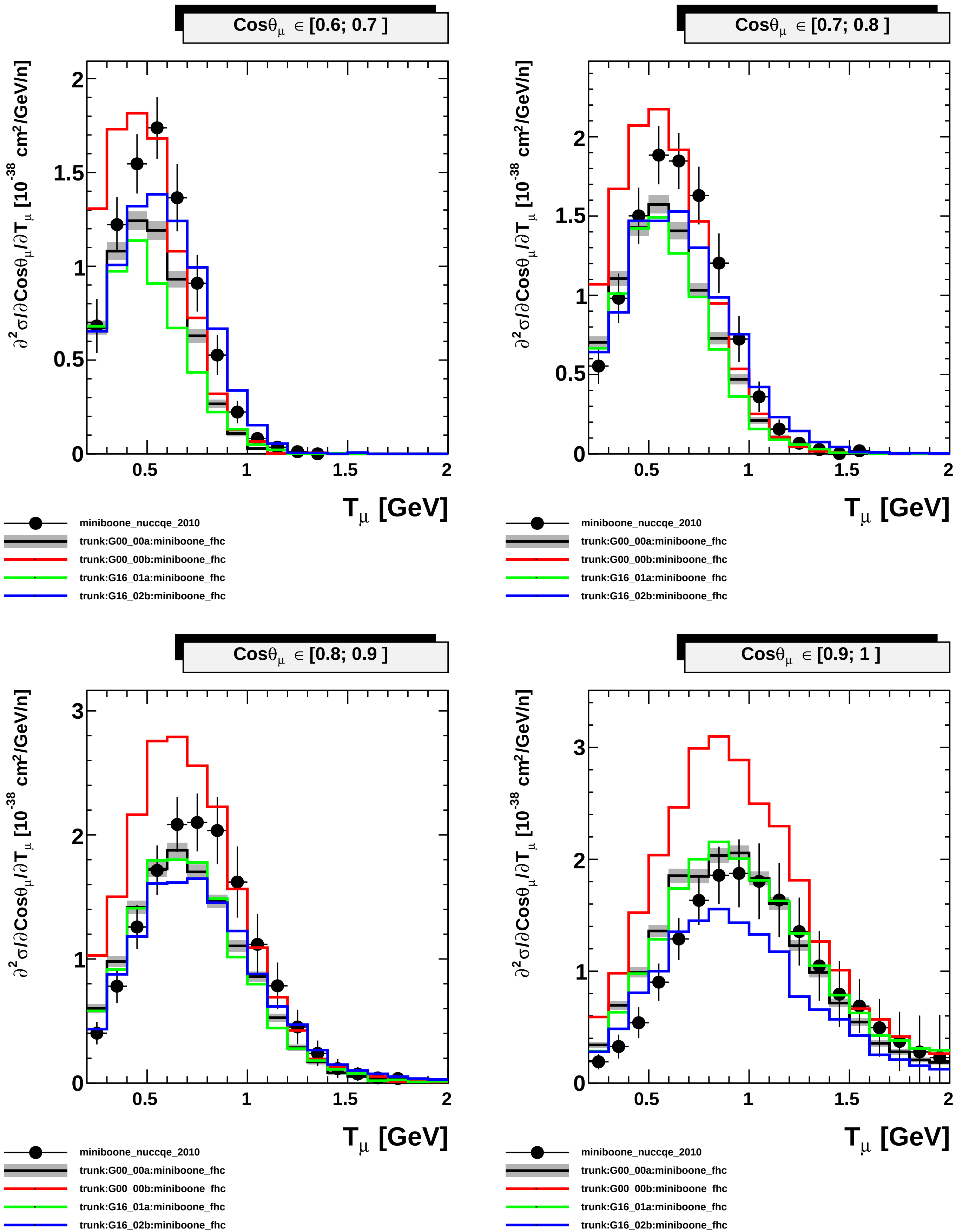
Cosθ_μ ∈ [0.3; 0.4]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



Cosθ_μ ∈ [0.4; 0.5]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



Cosθ_μ ∈ [0.5; 0.6]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



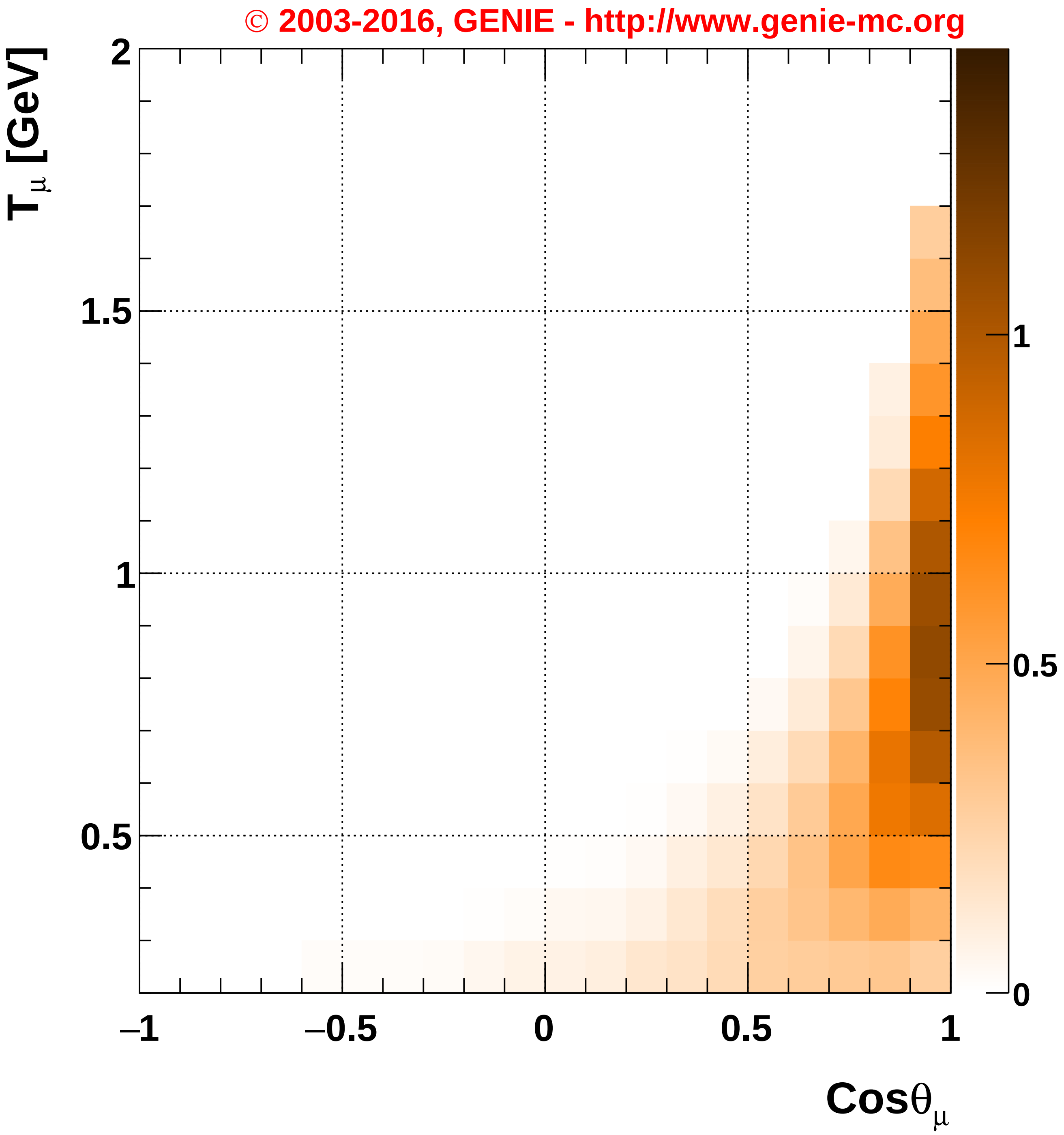
Cosθ_μ ∈ [0.6; 0.7]
Cosθ_μ ∈ [0.7; 0.8]
Cosθ_μ ∈ [0.8; 0.9]
Cosθ_μ ∈ [0.9; 1]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nuccqe_2010
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

GENIE comparisons with MiniBooNE CC 0π dataset

Dataset:
miniboone_nubarccqe_2013

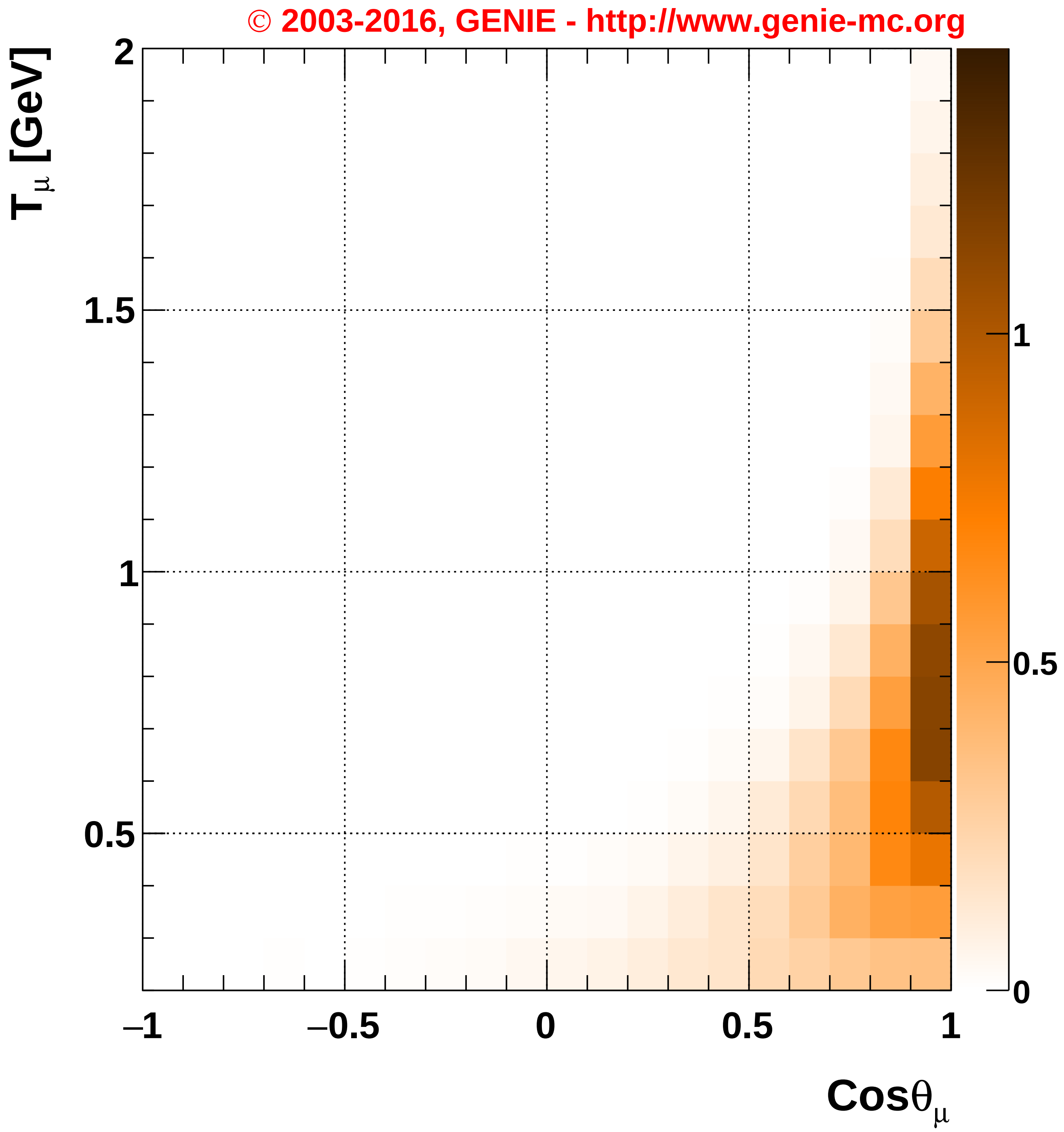
Models:
trunk/G00_00a
trunk/G00_00b
trunk/G16_01a
trunk/G16_02b

2016/11/22 12:29:32



$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]

Data: miniboone_nubarccqe_2013



$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm²/GeV/n]

Pred: trunk:G00_00a:miniboone_rhc

miniboone_nubarccqe_2013

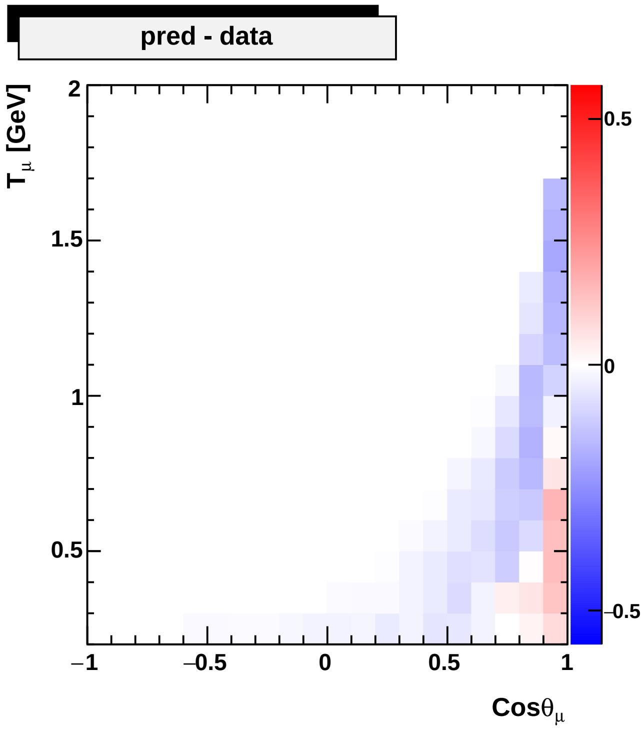
VS

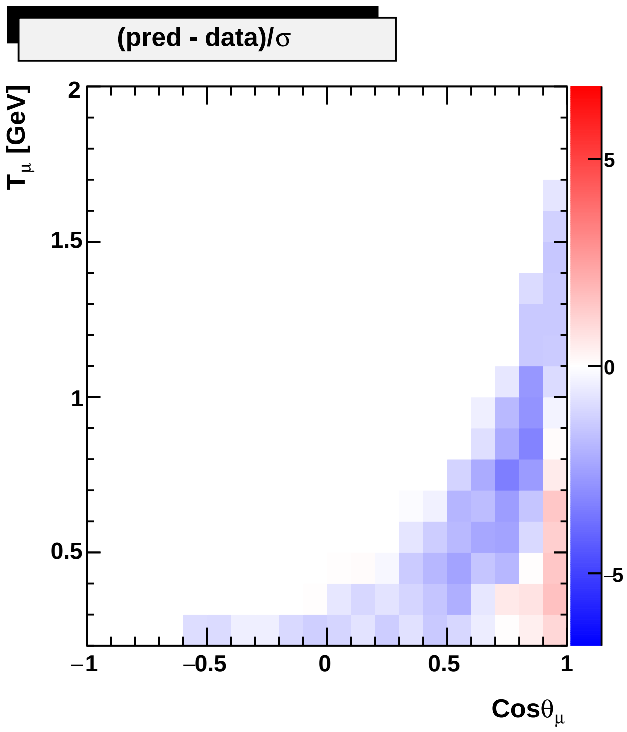
trunk:G00_00a:miniboone_rhc

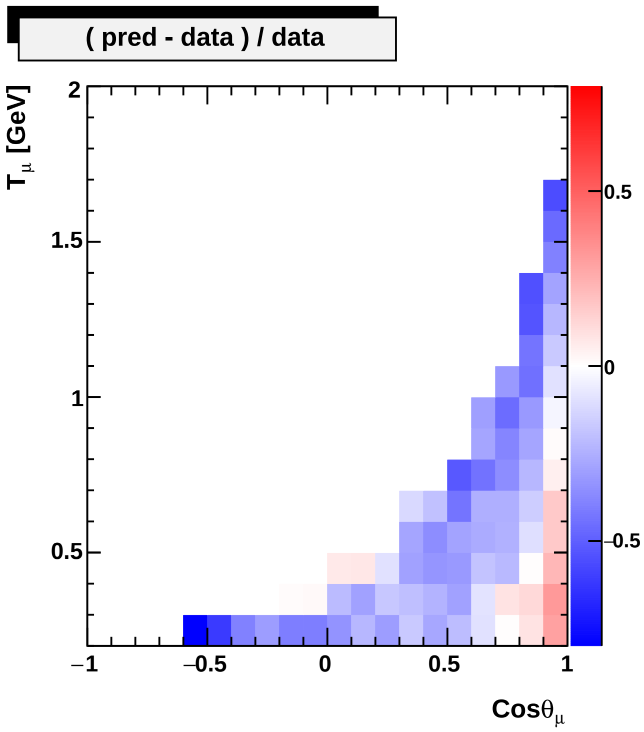
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$

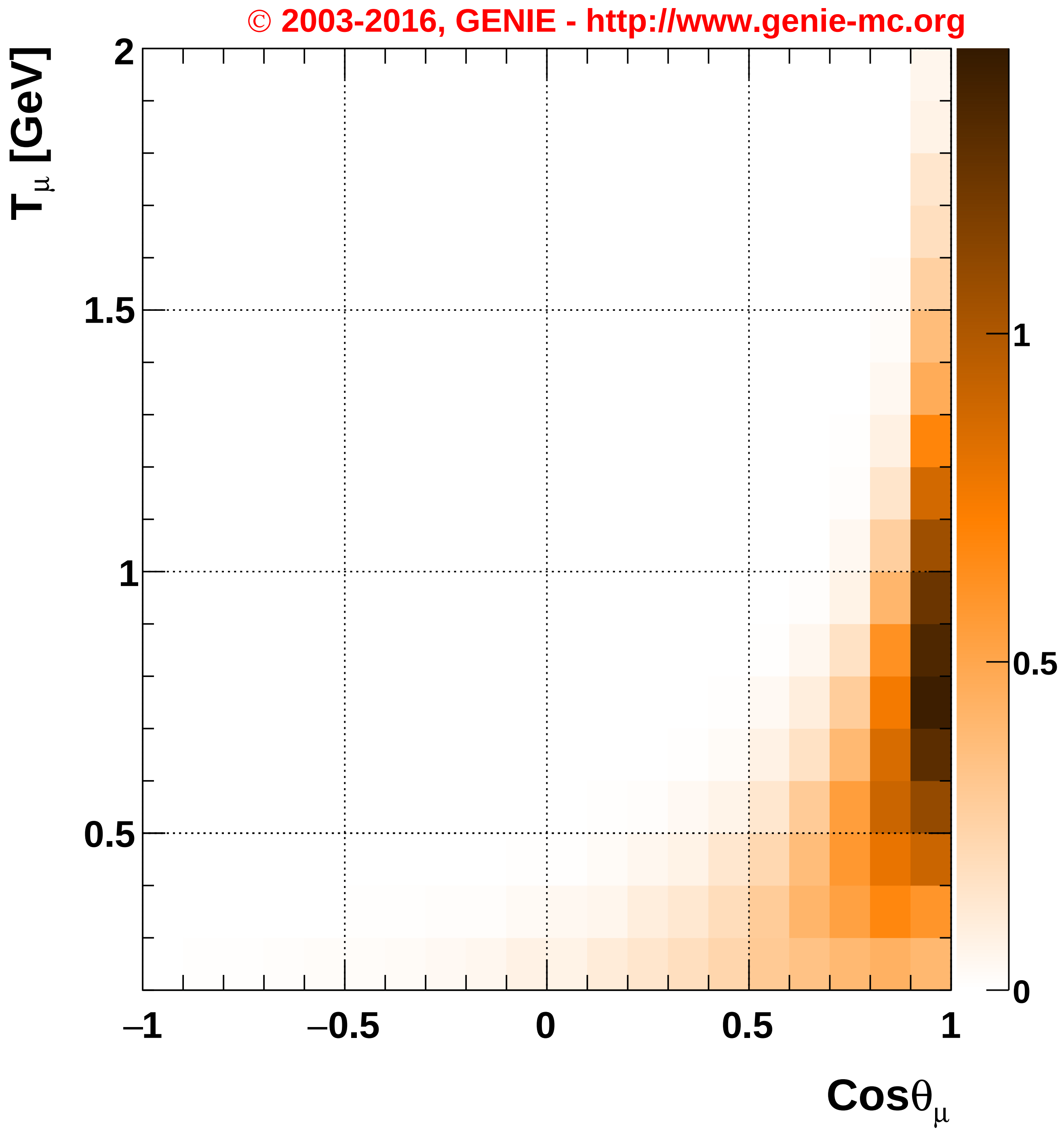
$[10^{-38}\ cm^2/GeV/n]$

χ^2 = 162.86/78 DoF









$\partial^2\sigma/\partial Cos\theta_{\mu}/\partial T_{\mu}$ [10^{-38} cm²/GeV/n]

Pred: trunk:G00_00b:miniboone_rhc

miniboone_nubarccqe_2013

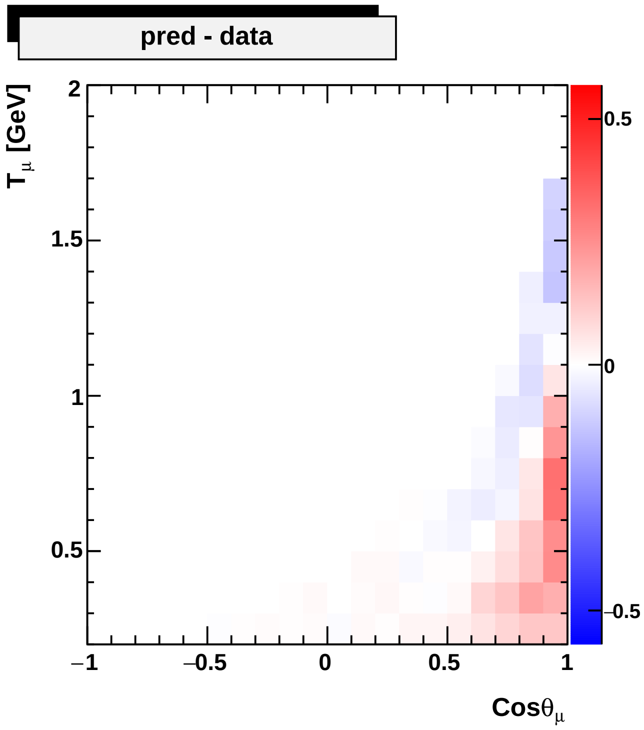
VS

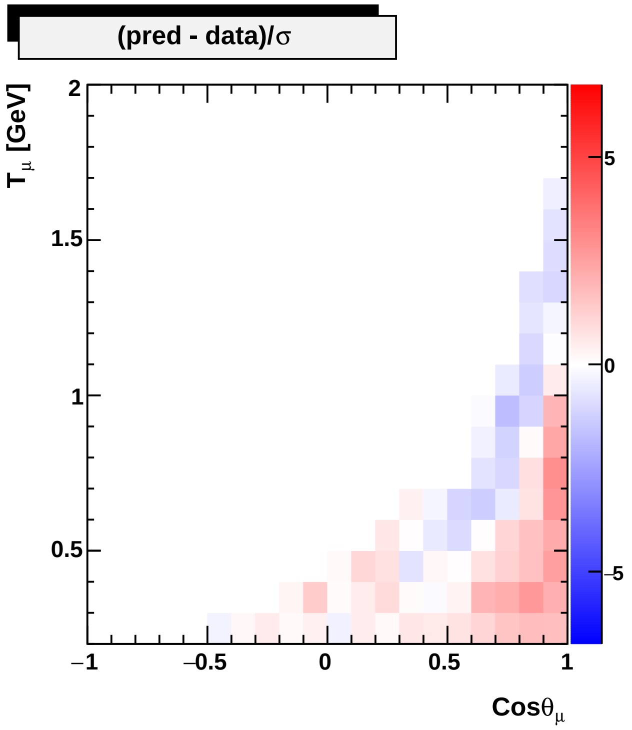
trunk:G00_00b:miniboone_rhc

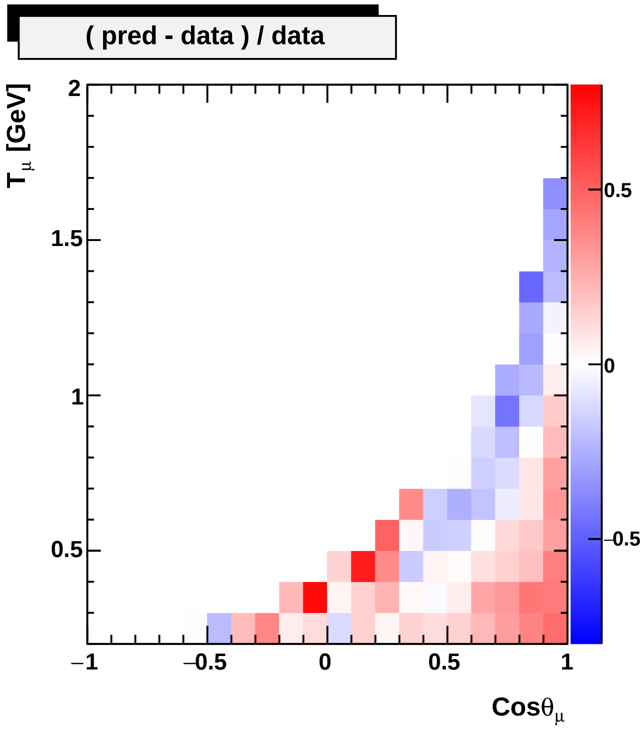
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$

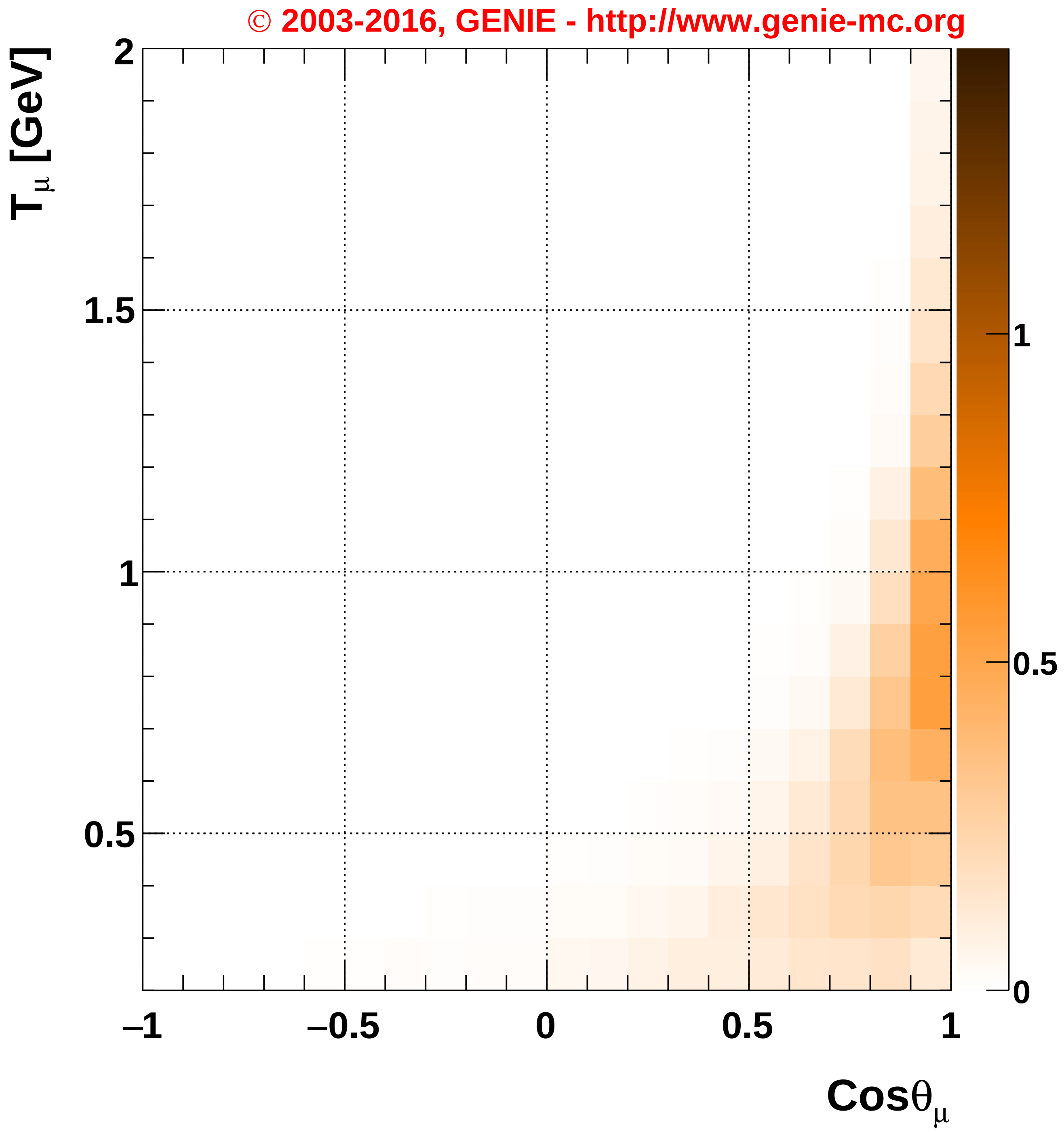
[10^{-38} cm^2/GeV/n]

χ^2 = 104.75/78 DoF









$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]

Pred: trunk:G16_01a:miniboone_rhc

miniboone_nubarccqe_2013

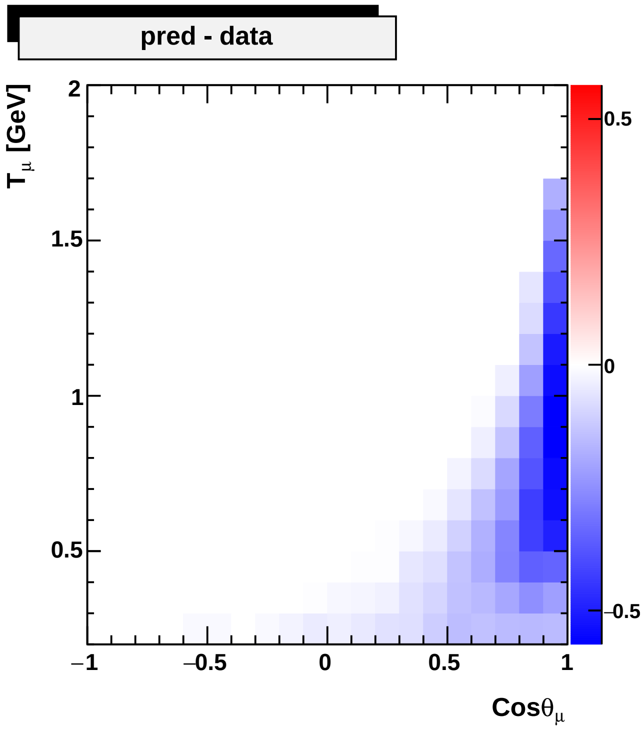
VS

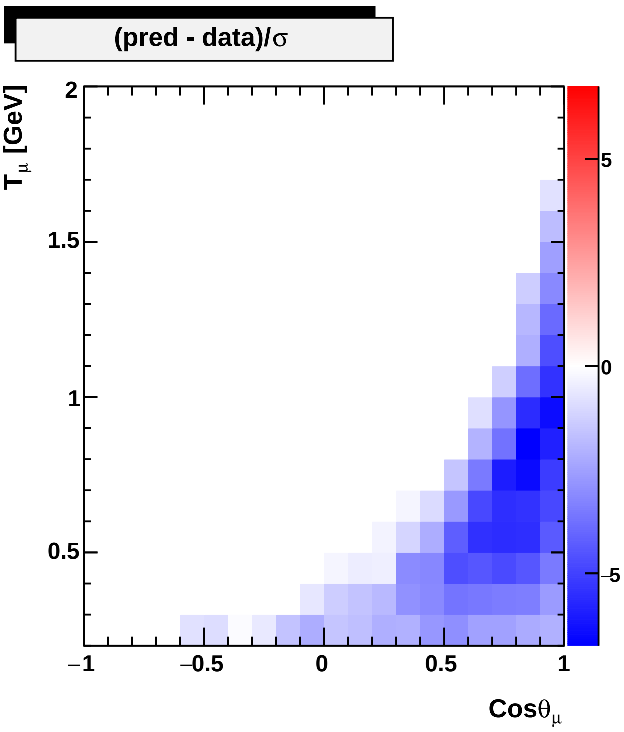
trunk:G16_01a:miniboone_rhc

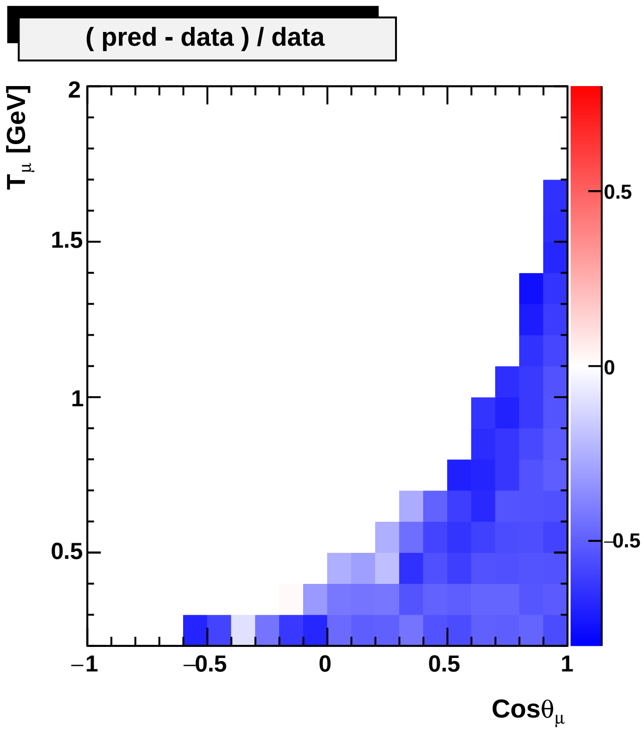
$\partial^2\sigma/\partial\mathrm{Cos}\theta_\mu/\partial T_\mu$

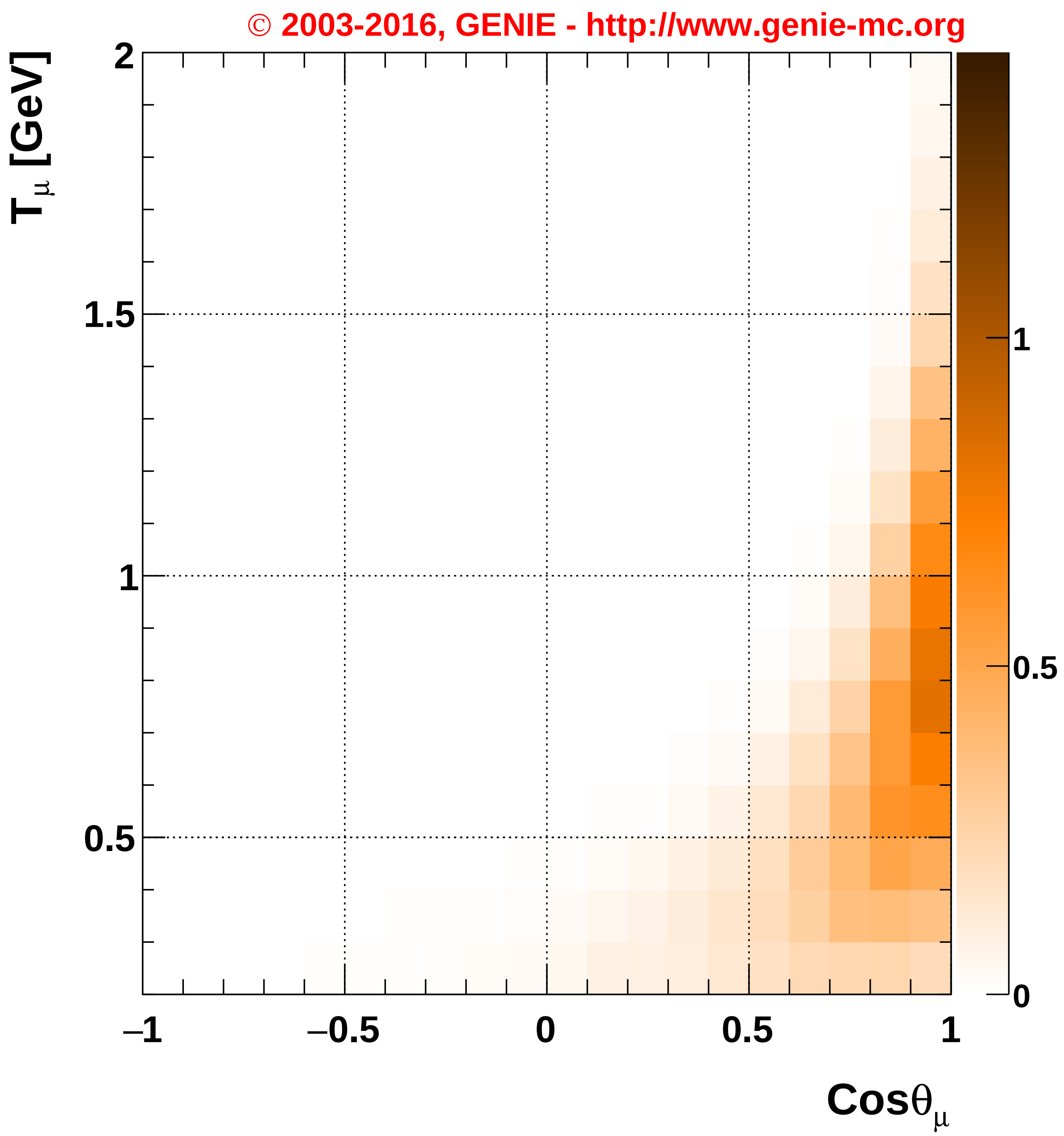
$[10^{-38}\ \mathrm{cm}^2/\mathrm{GeV/n}]$

χ^2 = 915.666/78 DoF









$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm²/GeV/n]

Pred: trunk:G16_02b:miniboone_rhc

miniboone_nubarccqe_2013

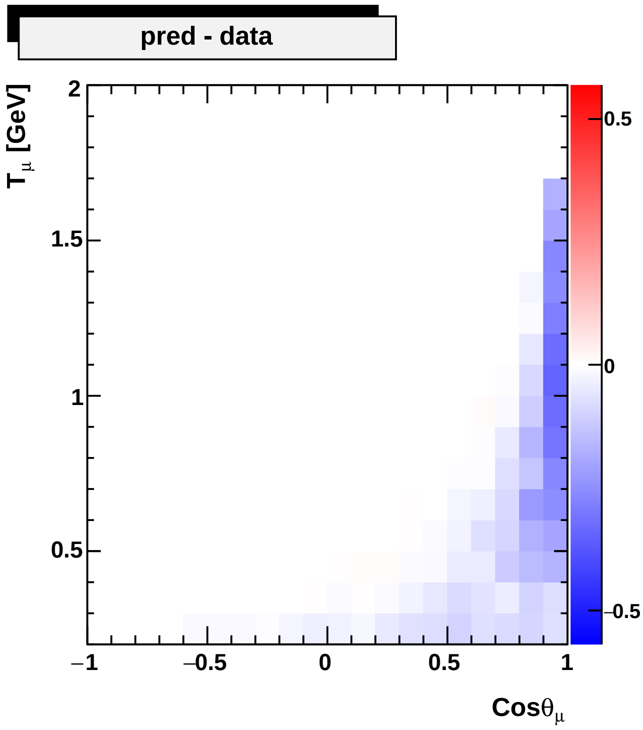
VS

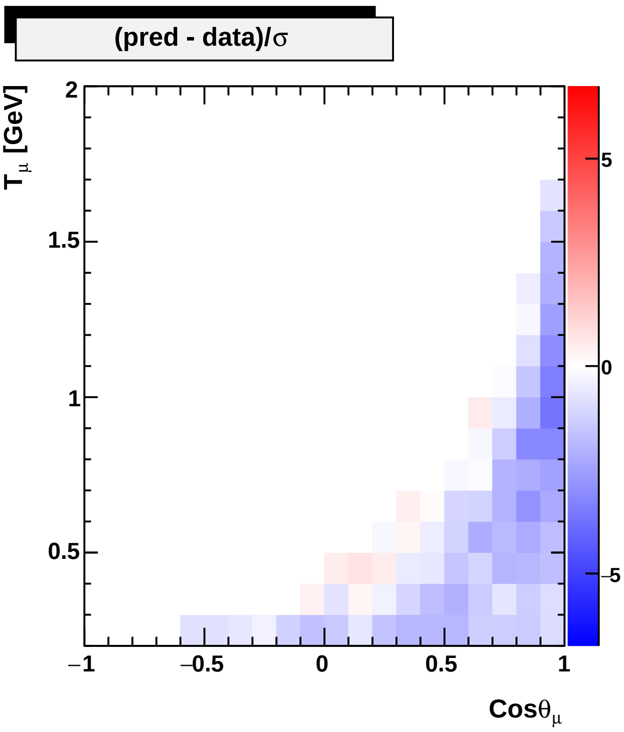
trunk:G16_02b:miniboone_rhc

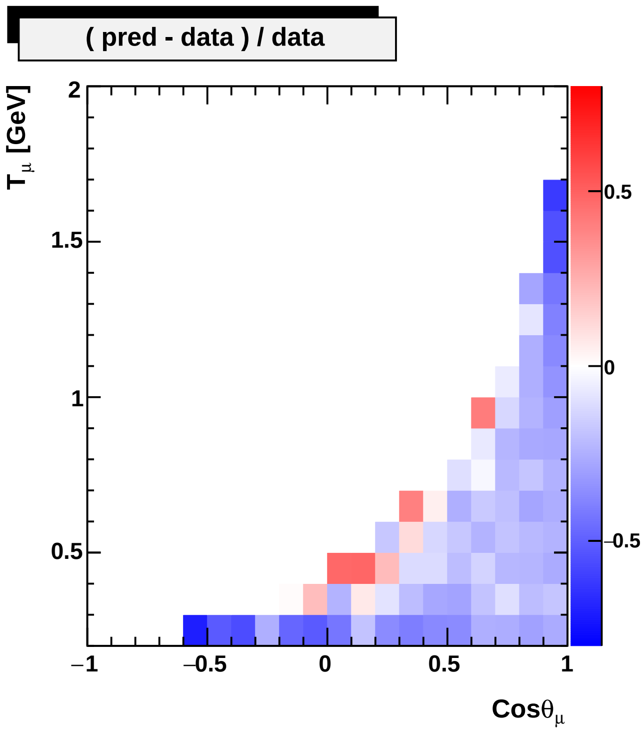
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$

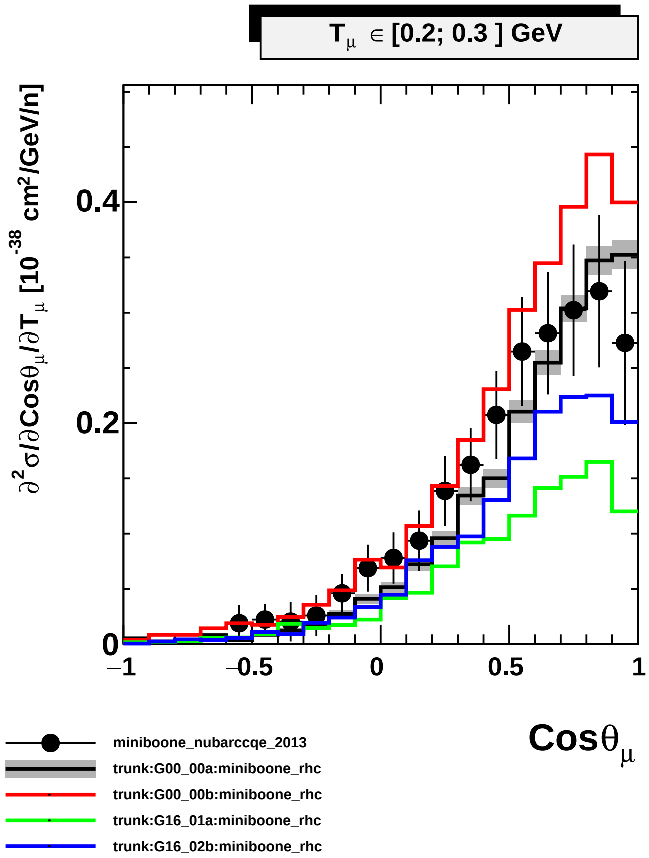
$[10^{-38}\ cm^2/GeV/n]$

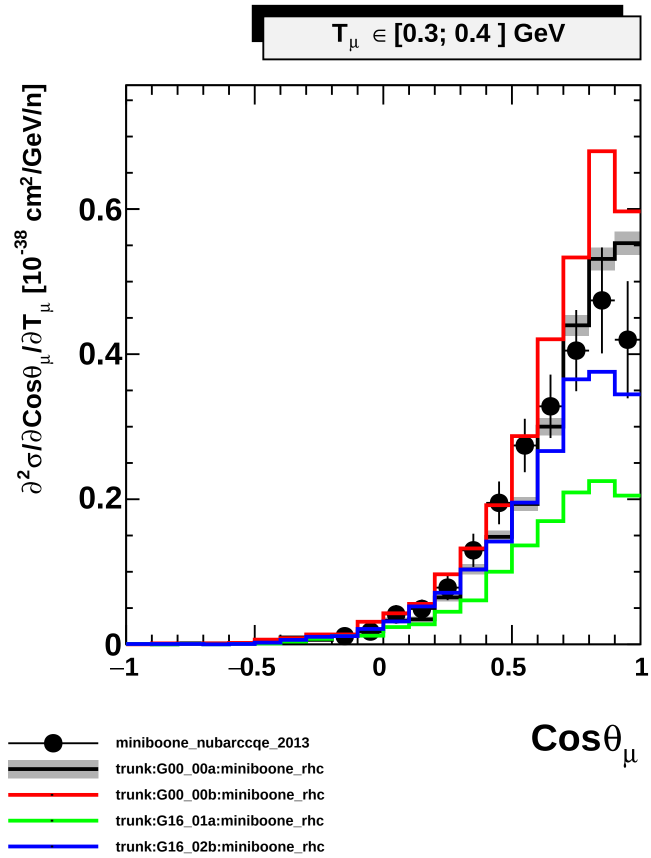
χ^2 = 192.653/78 DoF

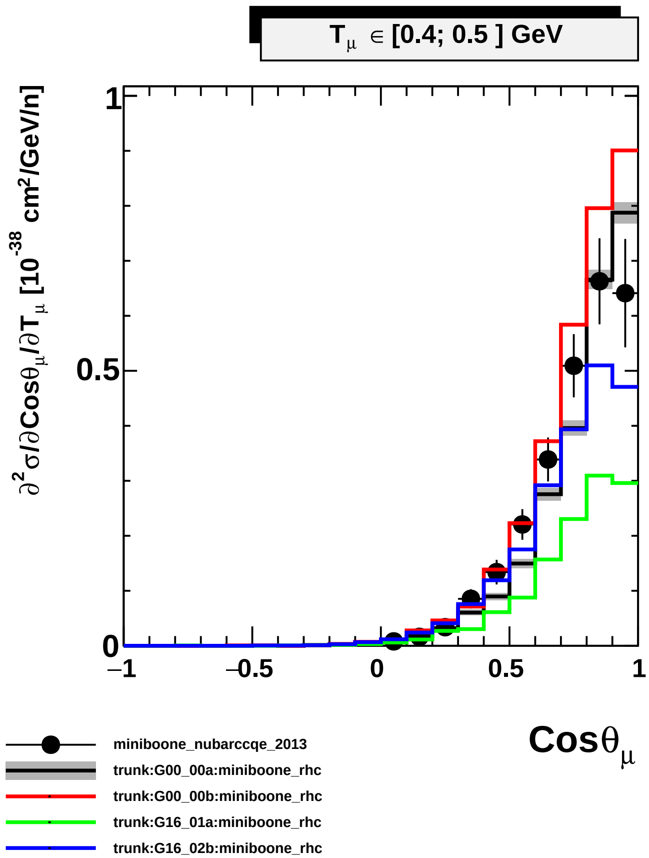


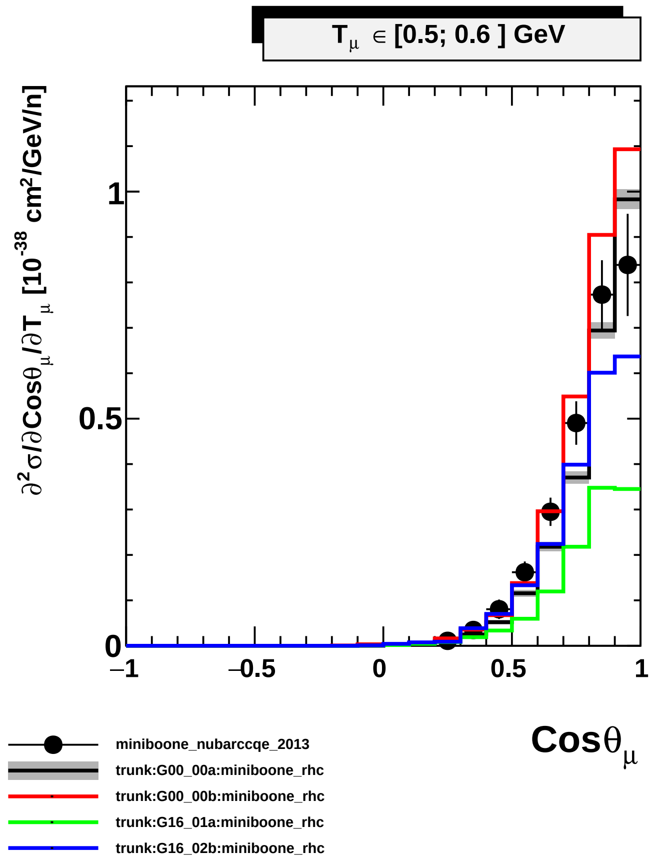


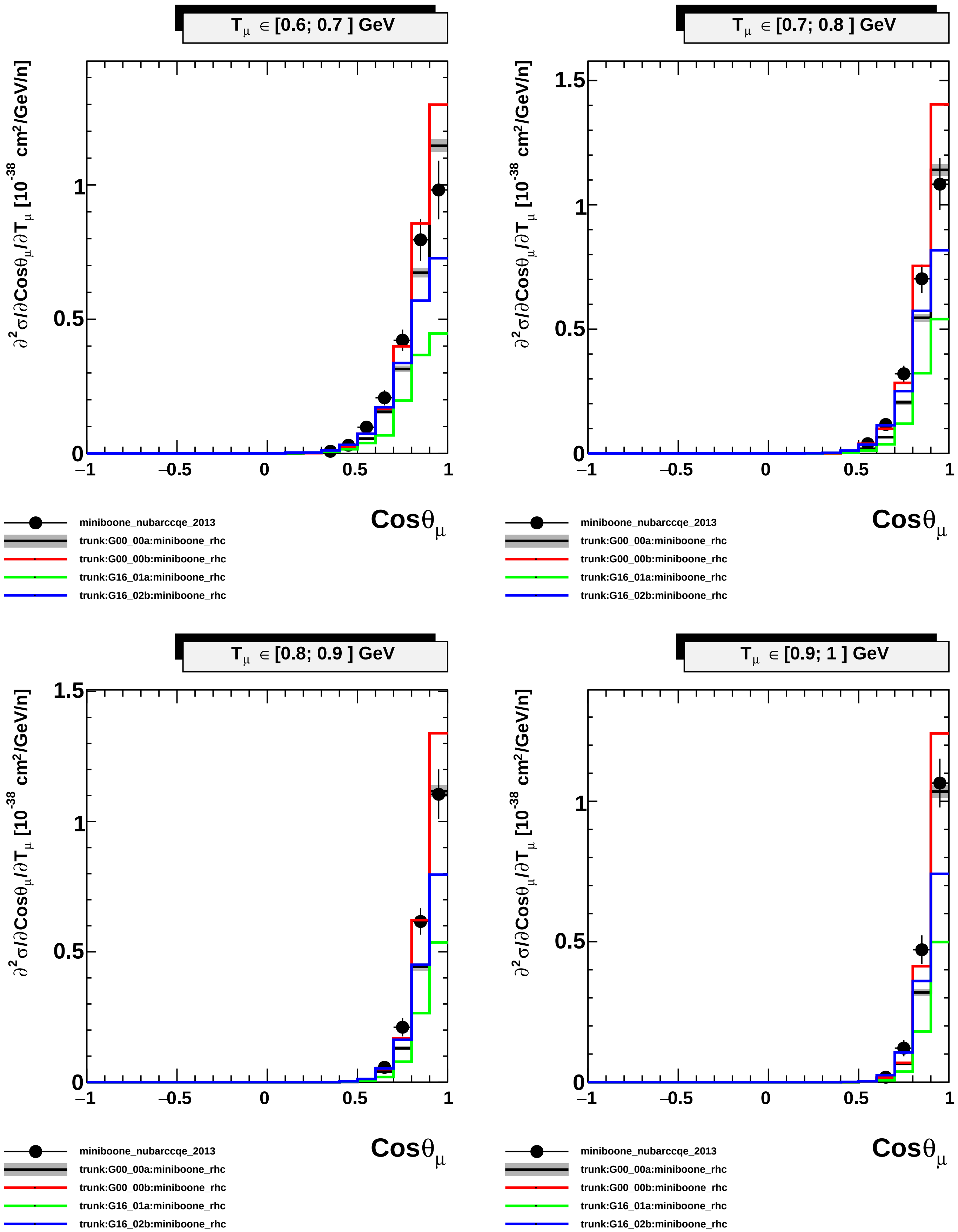



T_μ ∈ [0.2; 0.3] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV/n]
Cosθ_μ
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

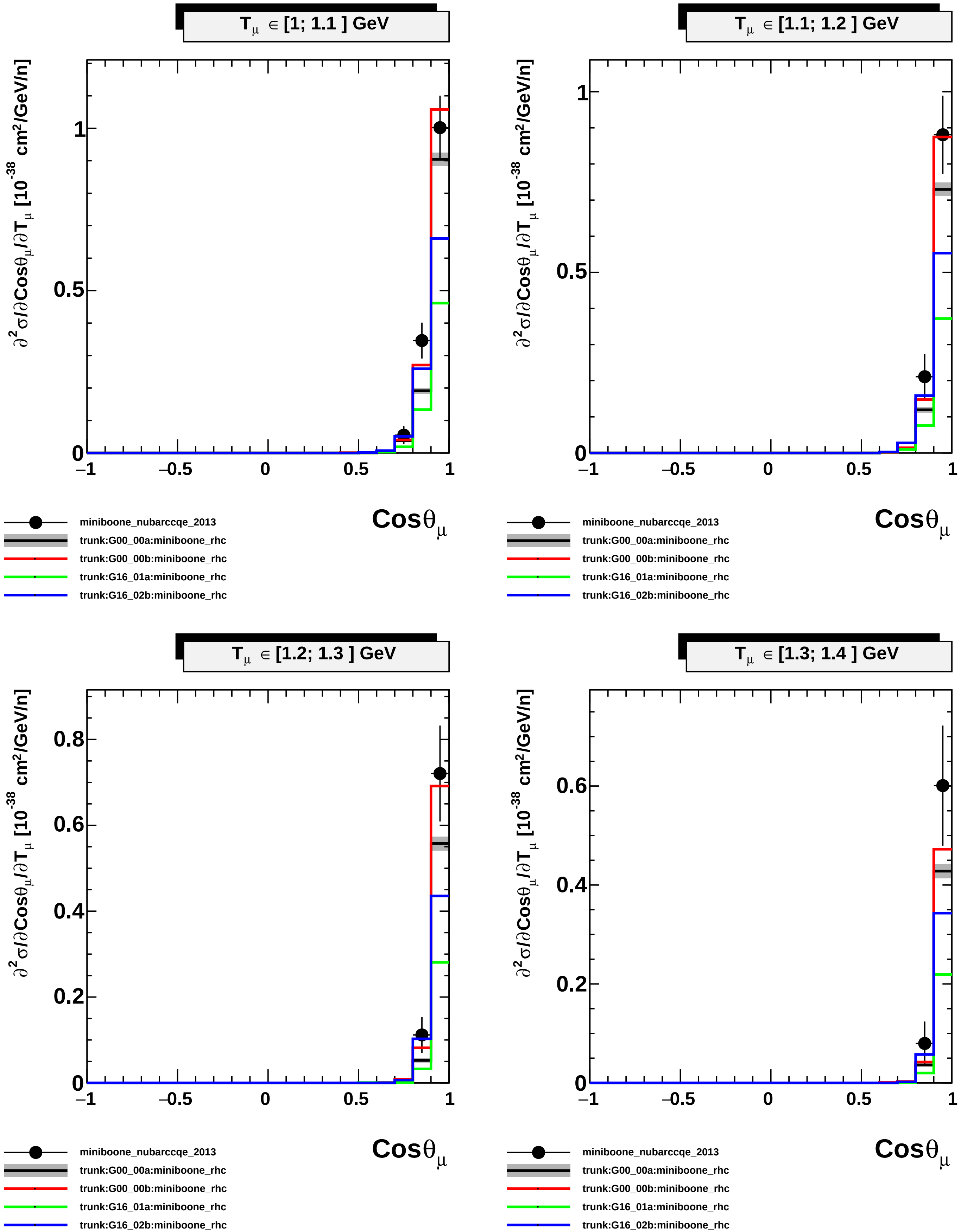

T_μ ∈ [0.3; 0.4] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV/n]
Cosθ_μ
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc


T_μ ∈ [0.4; 0.5] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV/n]
Cosθ_μ
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

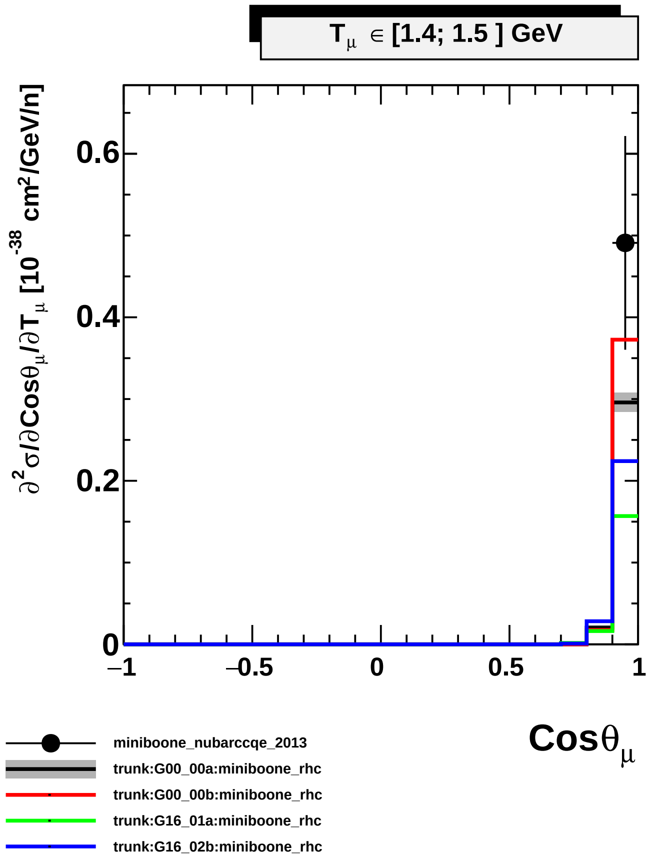

T_μ ∈ [0.5; 0.6] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV/n]
Cosθ_μ
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

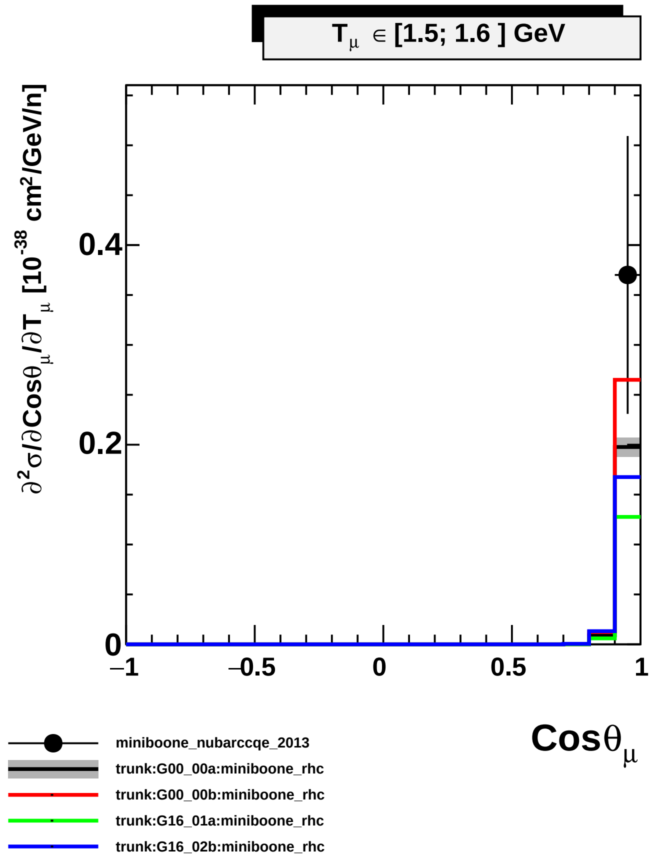


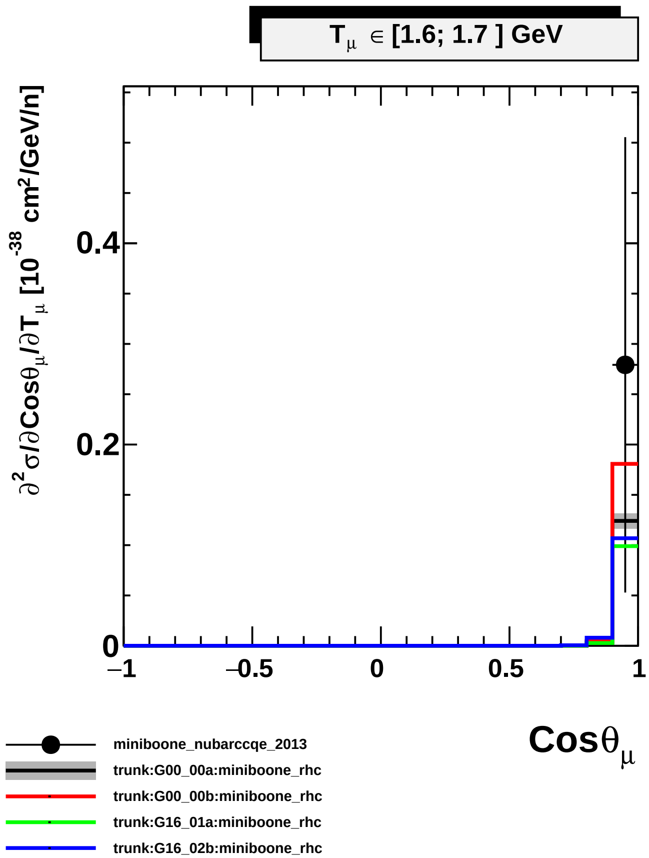
T_μ ∈ [0.6; 0.7] GeV
T_μ ∈ [0.7; 0.8] GeV
T_μ ∈ [0.8; 0.9] GeV
T_μ ∈ [0.9; 1] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
Cosθ_μ
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

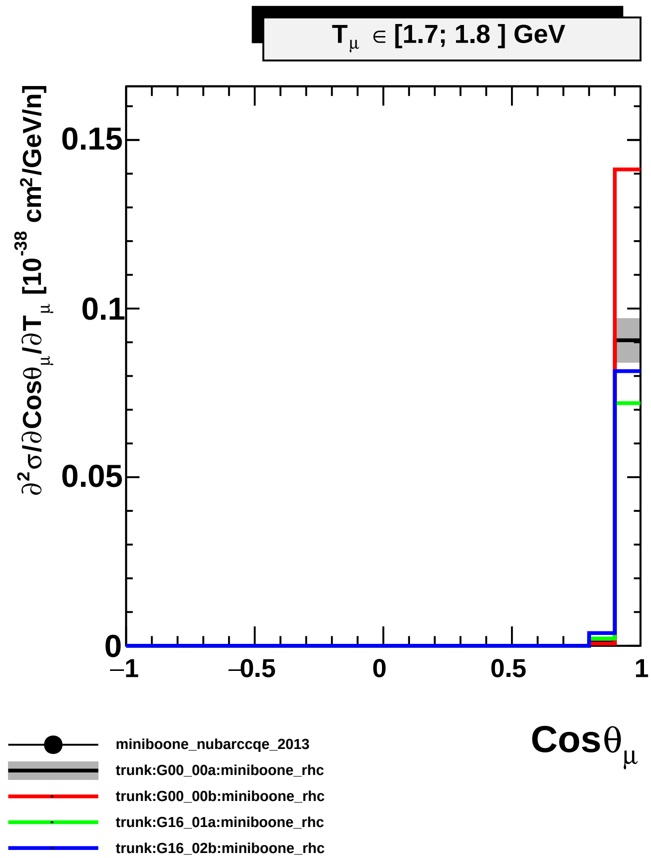


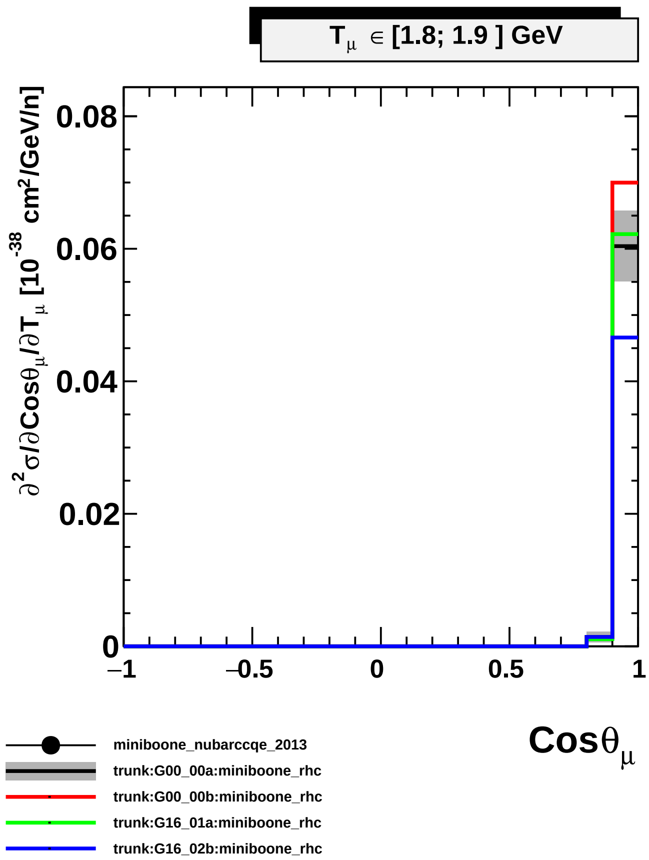
$T_\mu \in [1; 1.1]$ GeV
$T_\mu \in [1.1; 1.2]$ GeV
$T_\mu \in [1.2; 1.3]$ GeV
$T_\mu \in [1.3; 1.4]$ GeV
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
$Cos\theta_\mu$
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc


$T_\mu \in$ [1.4; 1.5] GeV
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
0
0.2
0.4
0.6
–1
–0.5
0
0.5
1
$Cos\theta_\mu$
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

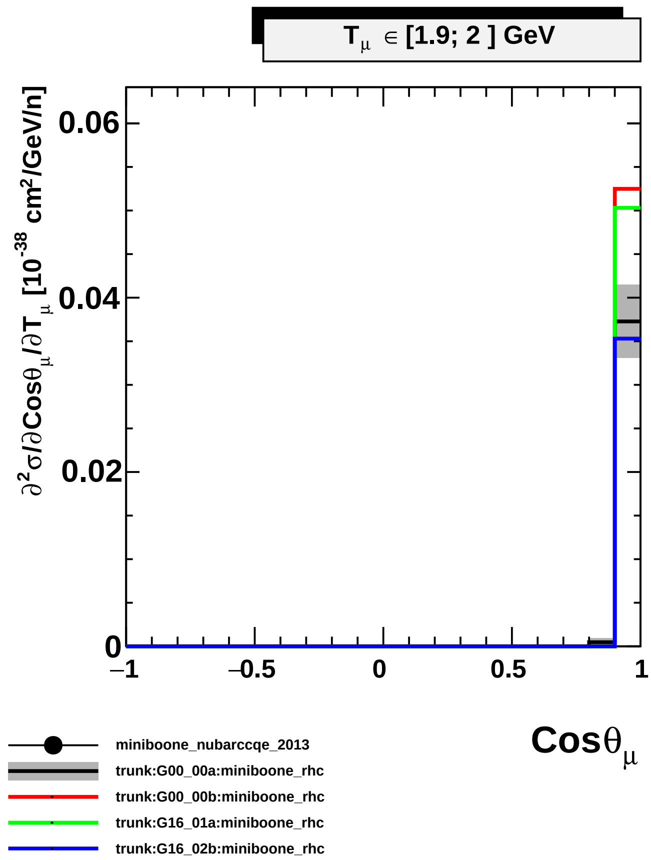

$T_\mu \in$ [1.5; 1.6] GeV
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
0
0.2
0.4
–1
–0.5
0
0.5
1
$Cos\theta_\mu$
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc


$T_\mu \in$ [1.6; 1.7] GeV
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
0
0.2
0.4
–1
–0.5
0
0.5
1
$Cos\theta_\mu$
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

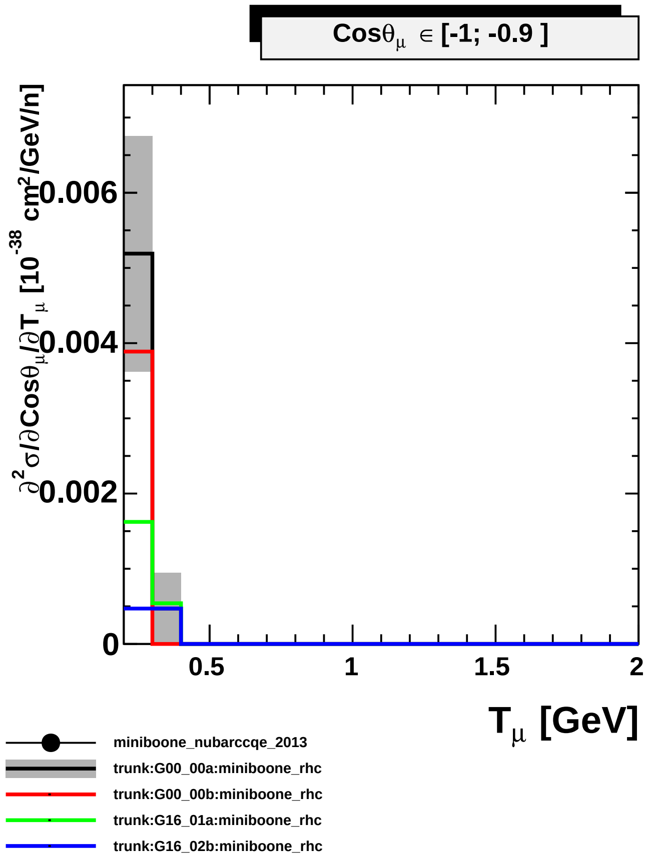

$T_\mu \in$ [1.7; 1.8] GeV
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
0
0.05
0.1
0.15
–1
–0.5
0
0.5
1
$Cos\theta_\mu$
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc



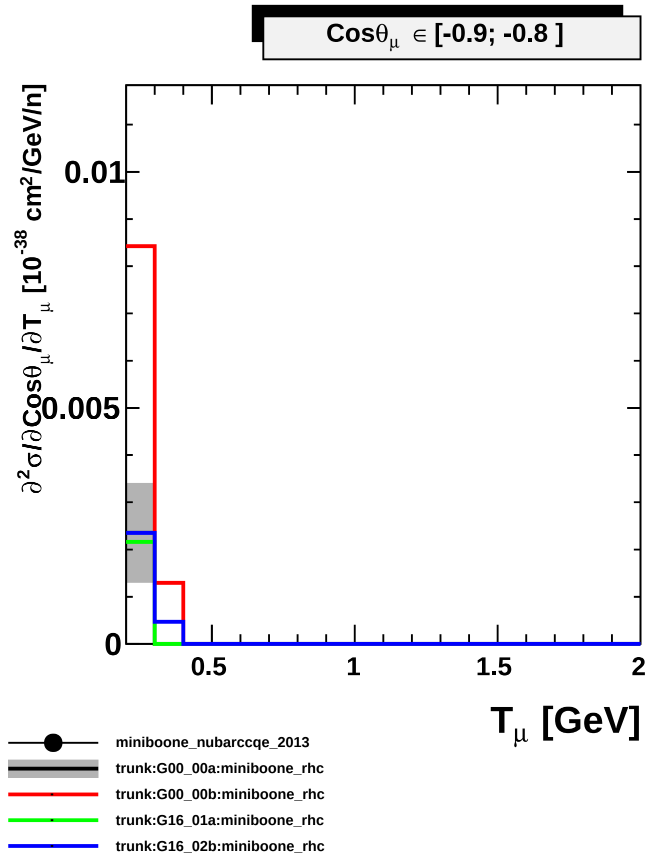
T_μ ∈ [1.8; 1.9] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
0.08
0.06
0.04
0.02
0
–1
–0.5
0
0.5
1
Cosθ_μ
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc



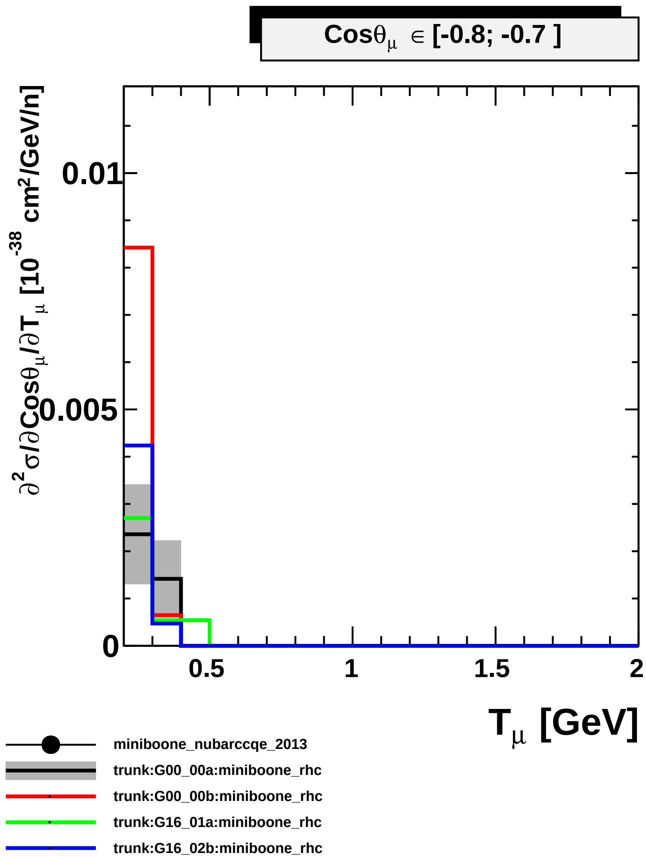
T_μ ∈ [1.9; 2] GeV
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
0.06
0.04
0.02
0
–1
–0.5
0
0.5
1
Cosθ_μ
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc



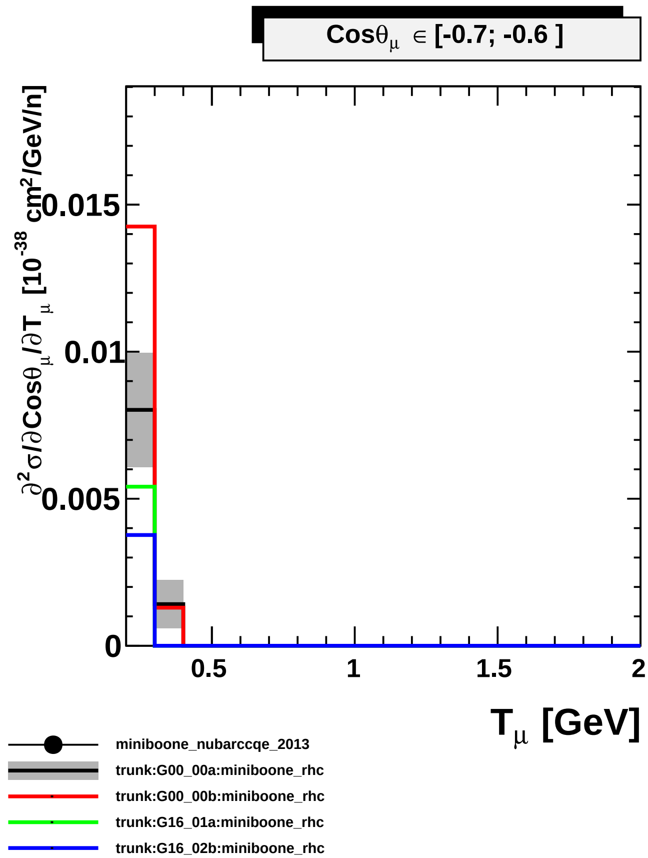
Cosθμ ∈ [-1; -0.9]
∂²σ/∂Cosθμ/∂Tμ [10⁻³⁸ cm²/GeV/n]
0
0.002
0.004
0.006
0.5
1
1.5
2
Tμ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc



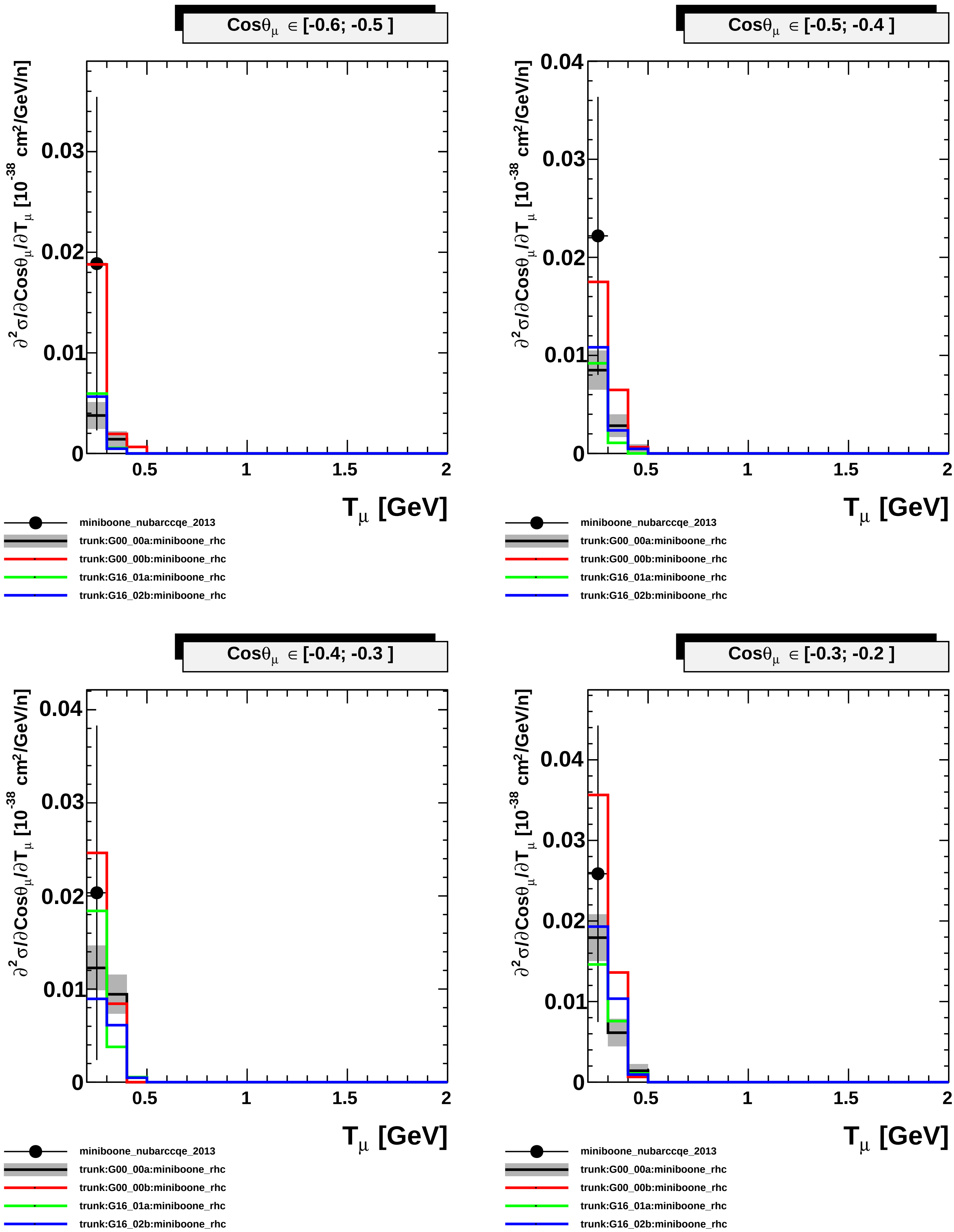
Cosθμ ∈ [-0.9; -0.8]
∂²σ/∂Cosθμ/∂Tμ [10⁻³⁸ cm²/GeV/n]
0
0.005
0.01
0.5
1
1.5
2
Tμ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc



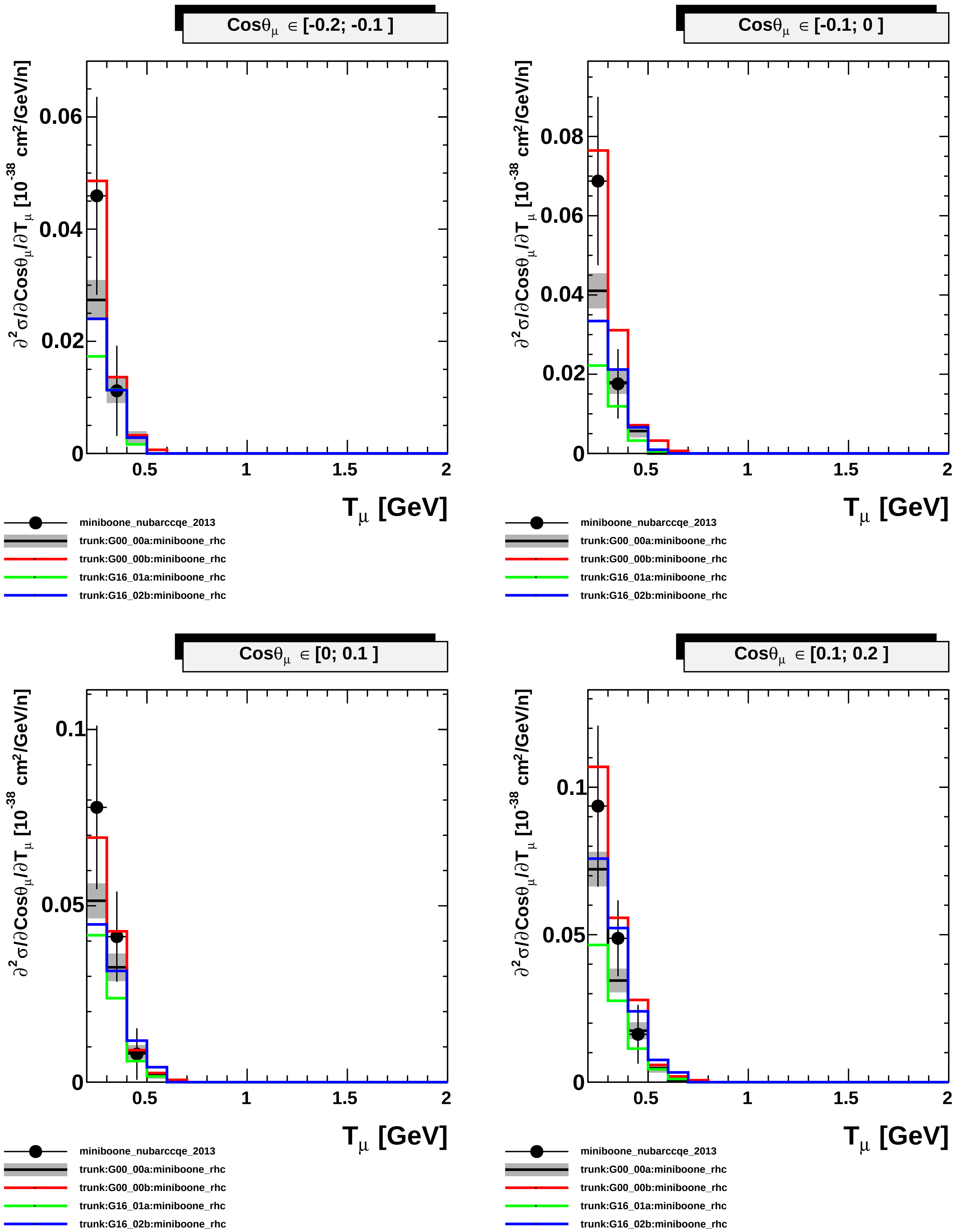
Cosθμ ∈ [-0.8; -0.7]
∂²σ/∂Cosθμ/∂Tμ [10⁻³⁸ cm²/GeV/n]
0
0.005
0.01
0.5
1
1.5
2
Tμ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc



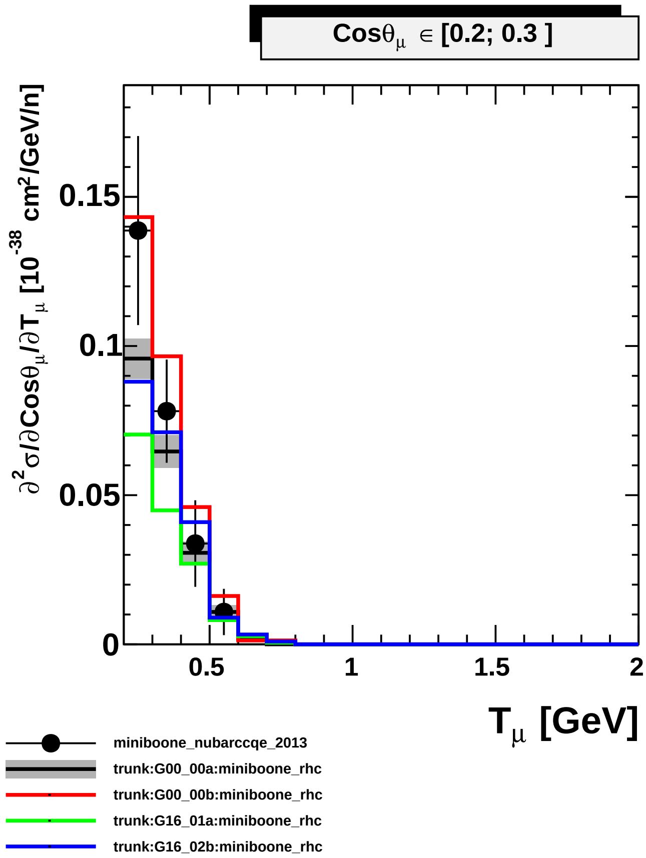
Cosθμ ∈ [-0.7; -0.6]
∂²σ/∂Cosθμ/∂Tμ [10⁻³⁸ cm²/GeV/n]
0
0.005
0.01
0.015
0.5
1
1.5
2
Tμ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

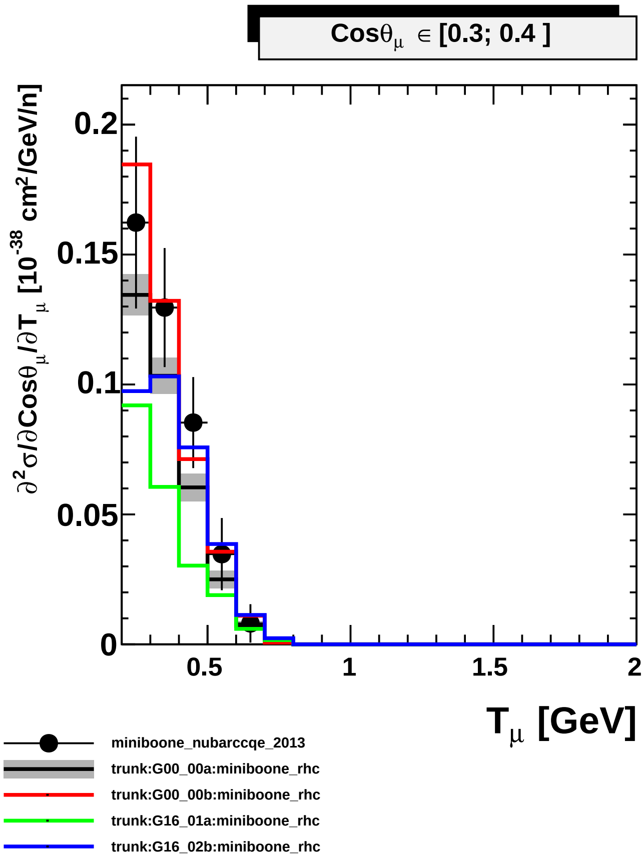


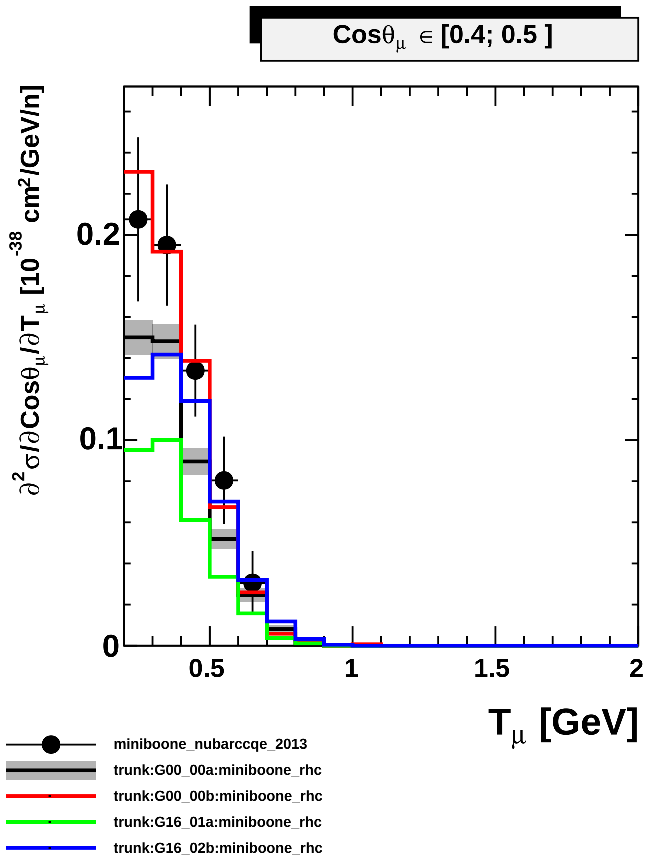
Cosθ_μ $\in$ [-0.6; -0.5]
Cosθ_μ $\in$ [-0.5; -0.4]
Cosθ_μ $\in$ [-0.4; -0.3]
Cosθ_μ $\in$ [-0.3; -0.2]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV/n]
T_μ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

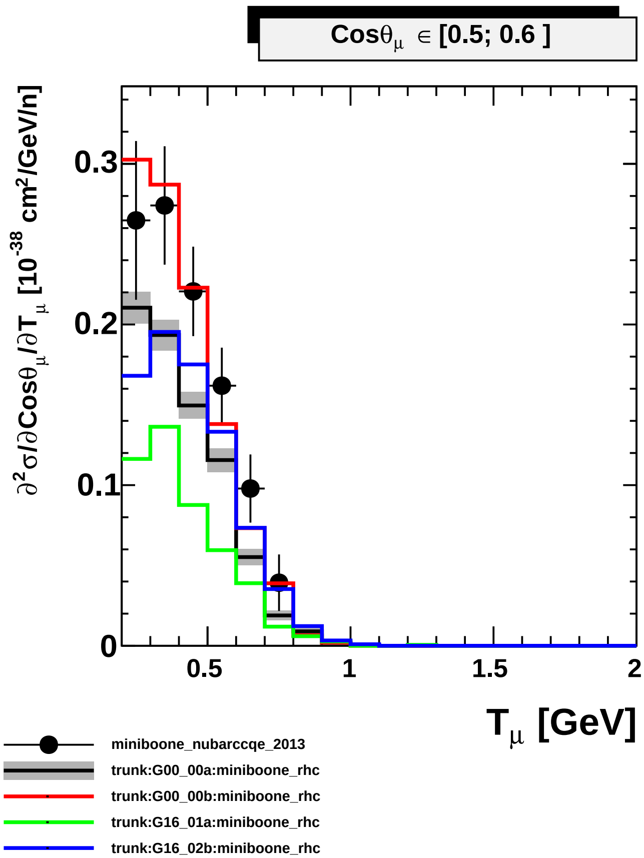


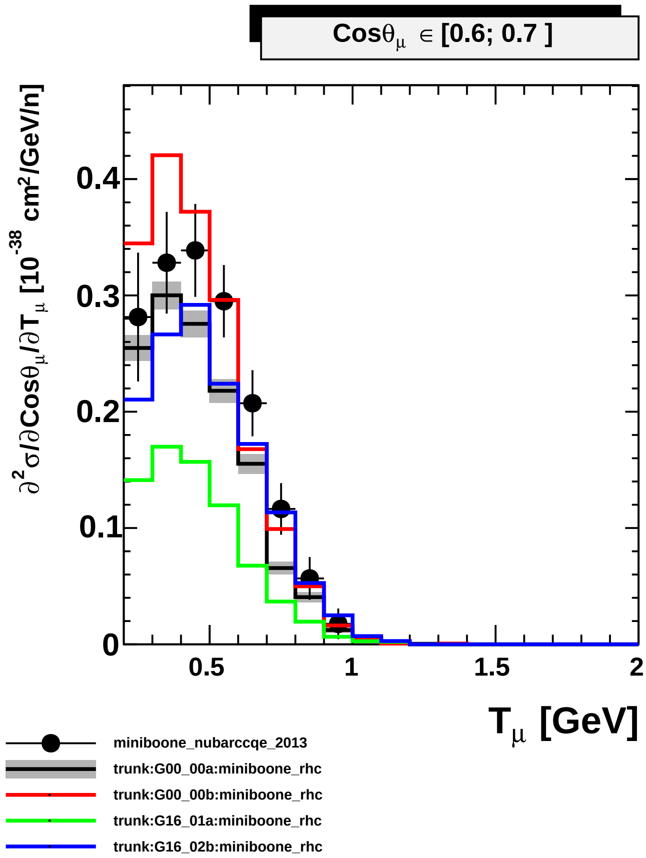
Cosθ_μ ∈ [-0.2; -0.1]
Cosθ_μ ∈ [-0.1; 0]
Cosθ_μ ∈ [0; 0.1]
Cosθ_μ ∈ [0.1; 0.2]
∂²σ/∂Cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV/n]
T_μ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

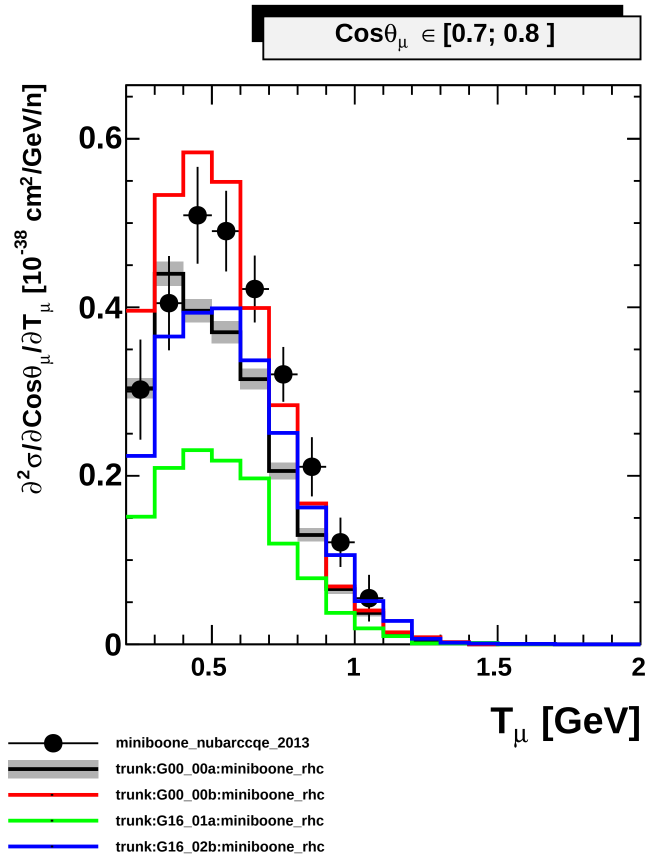

Cosθ_μ ∈ [0.2; 0.3]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

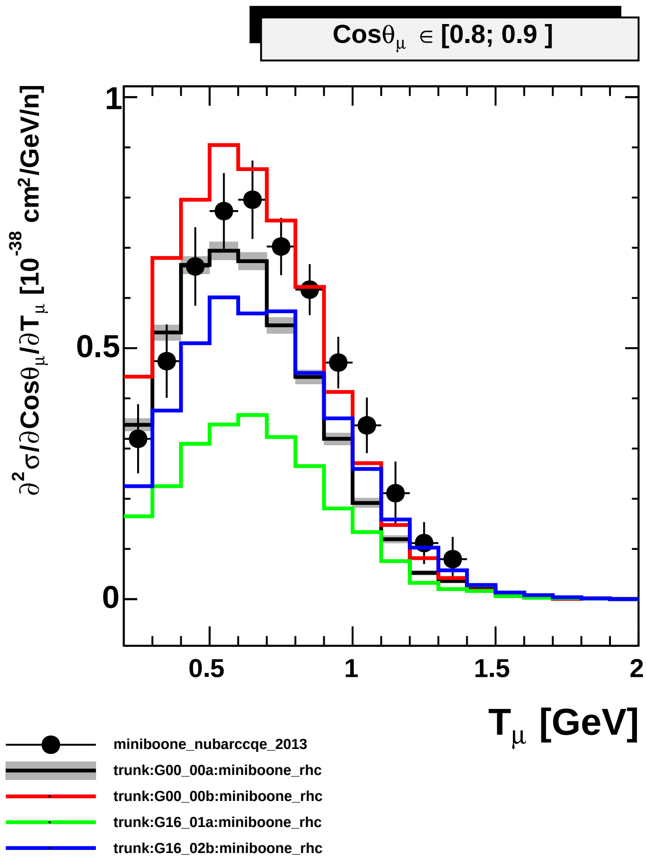

Cosθ_μ ∈ [0.3; 0.4]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

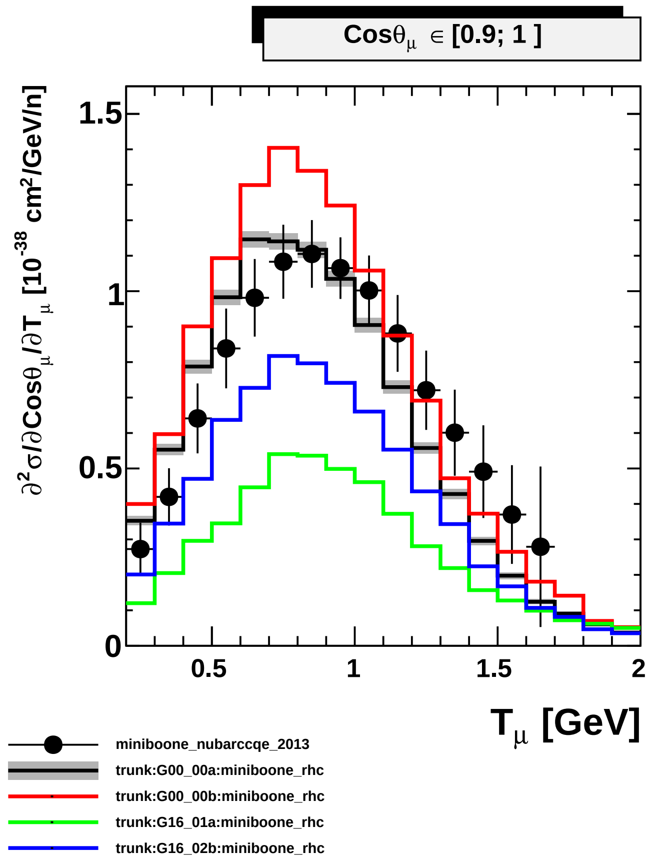

Cosθ_μ ∈ [0.4; 0.5]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc


Cosθ_μ ∈ [0.5; 0.6]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc


Cosθ_μ ∈ [0.6; 0.7]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc


Cosθ_μ ∈ [0.7; 0.8]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc


Cosθ_μ ∈ [0.8; 0.9]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

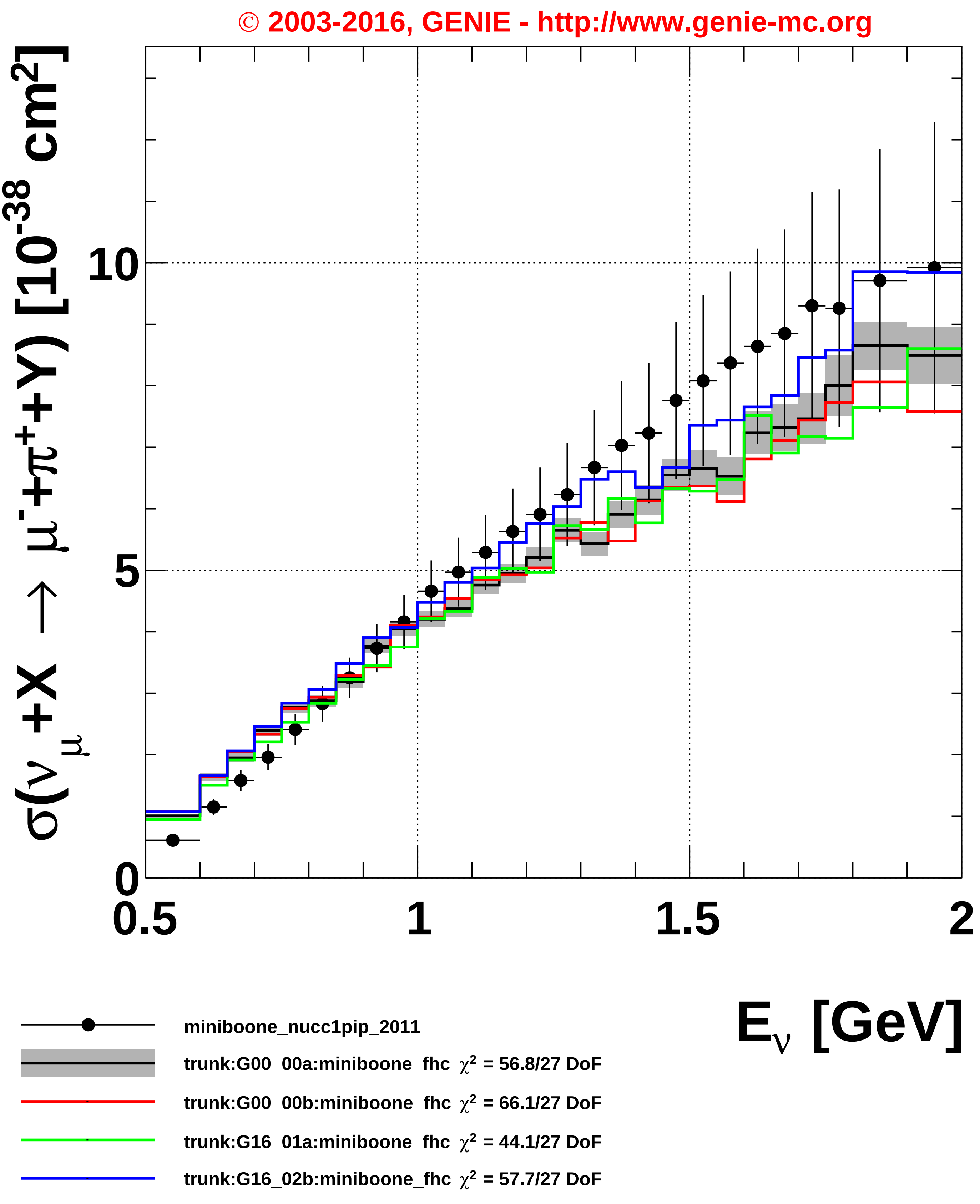

Cosθ_μ ∈ [0.9; 1]
∂²σ/∂Cosθ_μ/∂T_μ [10^-38 cm²/GeV/n]
T_μ [GeV]
miniboone_nubarccqe_2013
trunk:G00_00a:miniboone_rhc
trunk:G00_00b:miniboone_rhc
trunk:G16_01a:miniboone_rhc
trunk:G16_02b:miniboone_rhc

GENIE Comparisons with MiniBooNE CC $1\pi^+$ data

Dataset:
miniboone_nucc1pip_2011

Models:
trunk/G00_00a
trunk/G00_00b
trunk/G16_01a
trunk/G16_02b

2016/11/22 12:29:35



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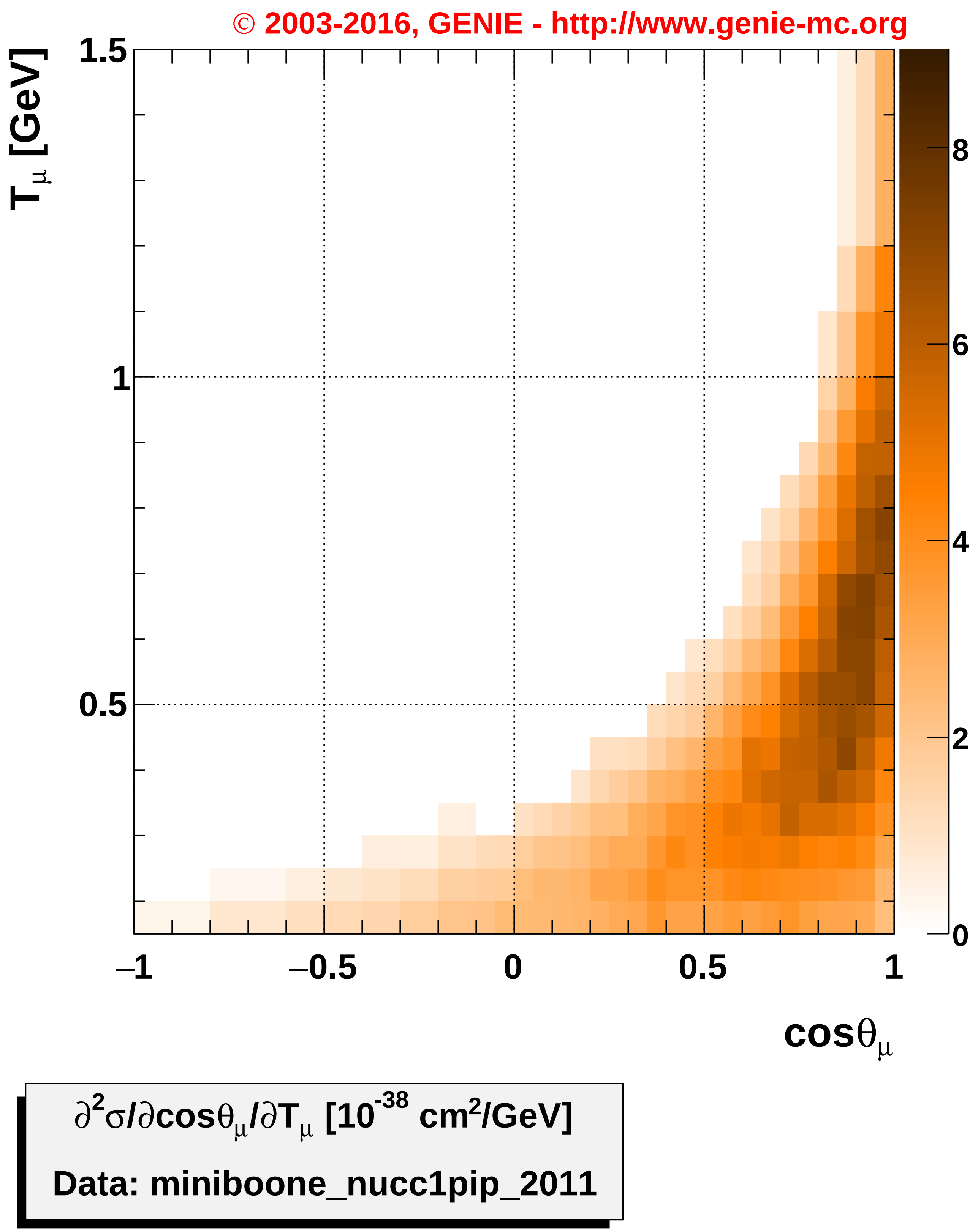
σ(ν_μ+X → μ⁻+π⁺+Y) [10⁻³⁸ cm²]
0
5
10
0.5
1
1.5
2
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc χ² = 56.8/27 DoF
trunk:G00_00b:miniboone_fhc χ² = 66.1/27 DoF
trunk:G16_01a:miniboone_fhc χ² = 44.1/27 DoF
trunk:G16_02b:miniboone_fhc χ² = 57.7/27 DoF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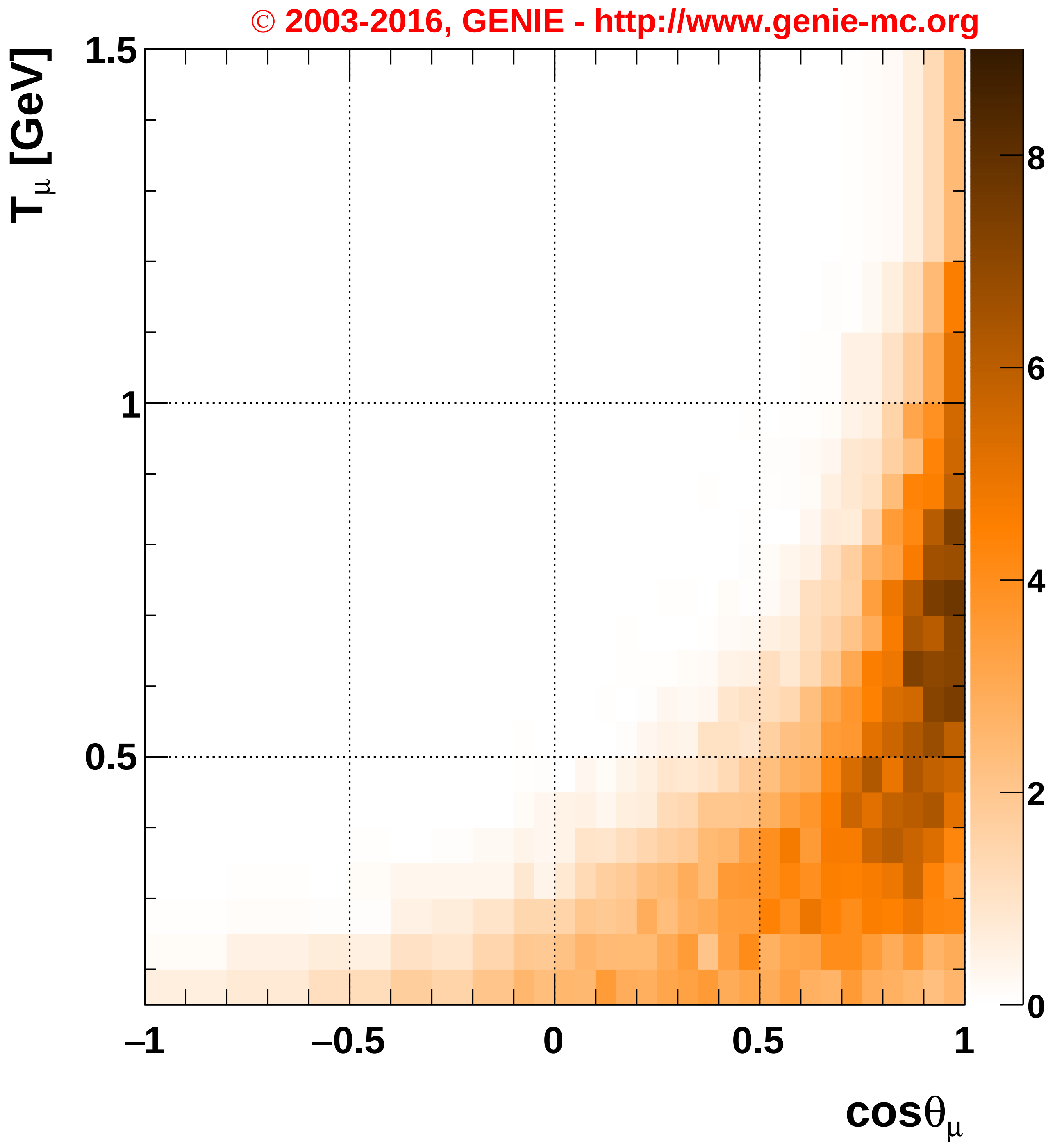
T_μ [GeV]
1.5
1
0.5
–1
–0.5
0
0.5
1
$\cos\theta_\mu$
0
2
4
6
8
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
Data: miniboone_nucc1pip_2011



$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]

Pred: trunk:G00_00a:miniboone_fhc

miniboone_nucc1pip_2011

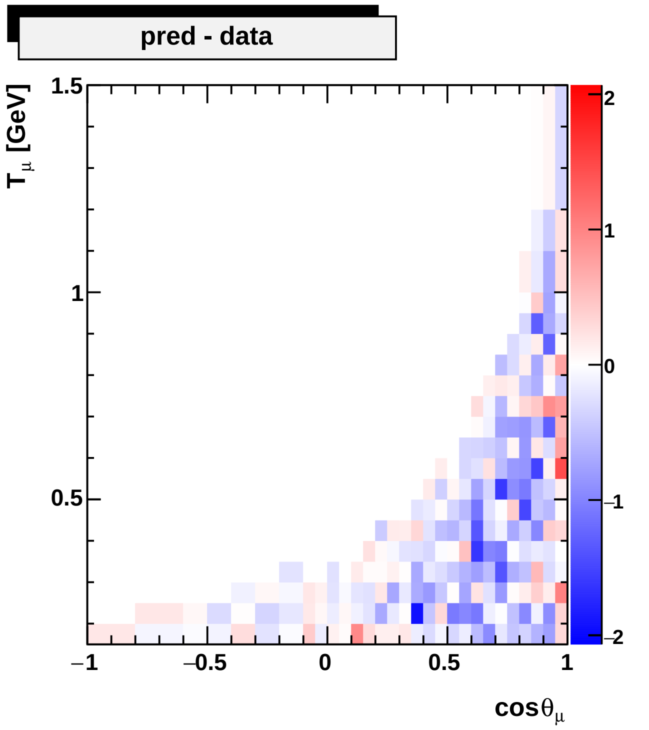
VS

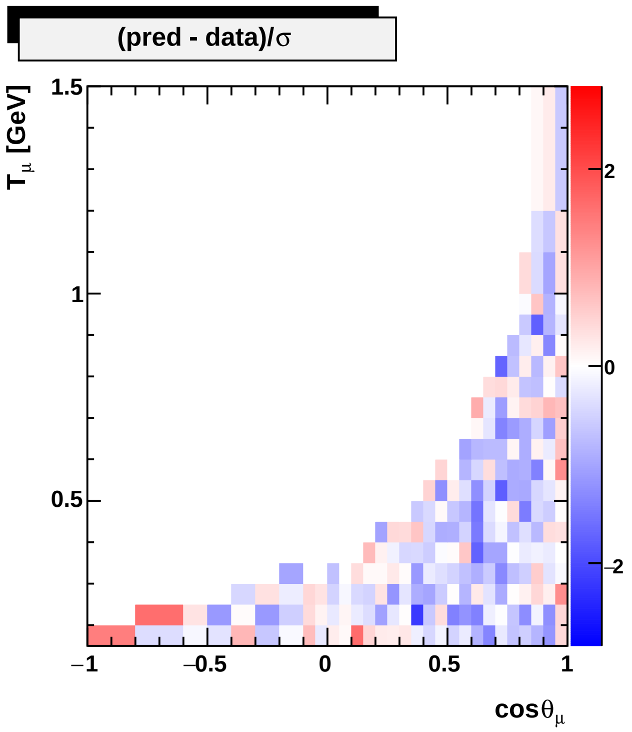
trunk:G00_00a:miniboone_fhc

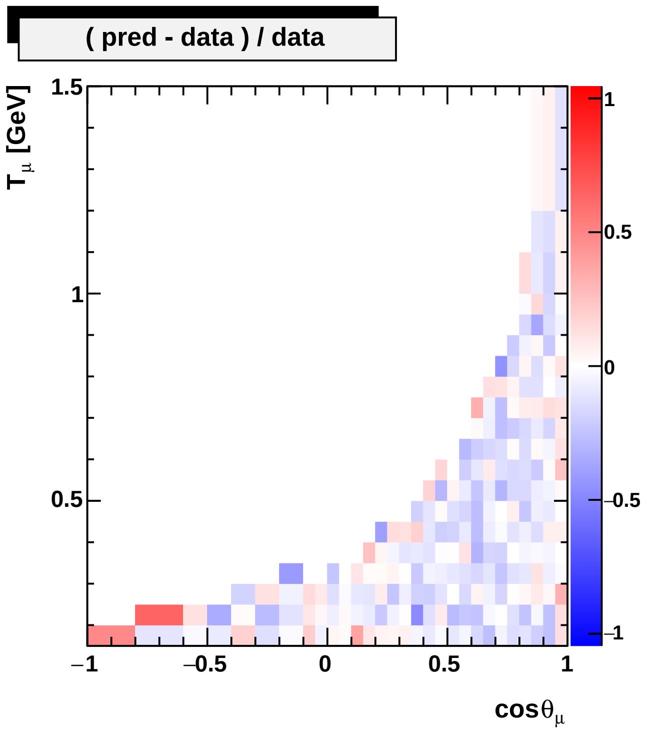
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$

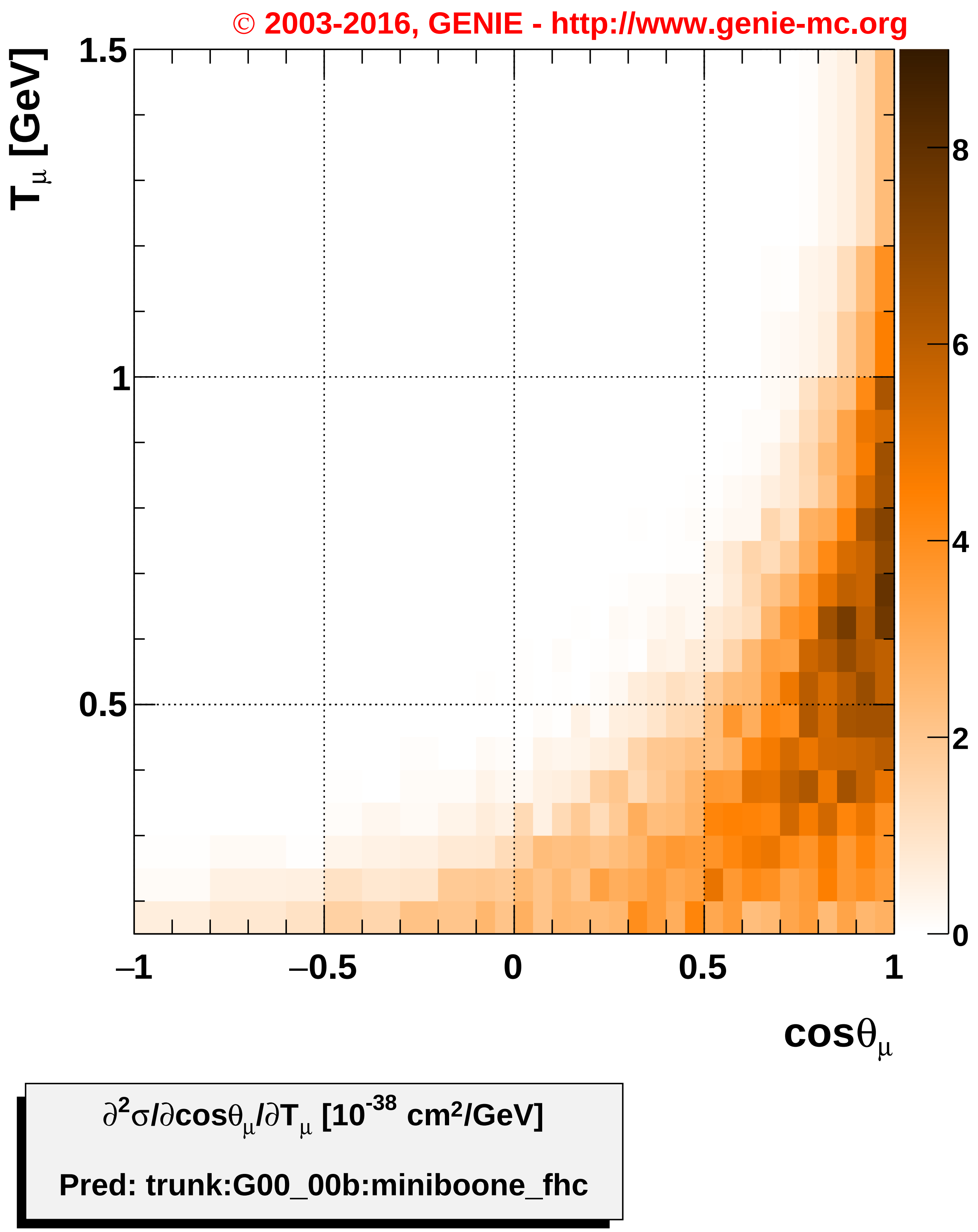
[10^{-38} cm^2/GeV]

χ^2 = 118.98/233 DoF





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T_μ [GeV]
$\cos\theta_\mu$
1.5
1
0.5
–1
–0.5
0
0.5
1
0
2
4
6
8
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
Pred: trunk:G00_00b:miniboone_fhc

miniboone_nucc1pip_2011

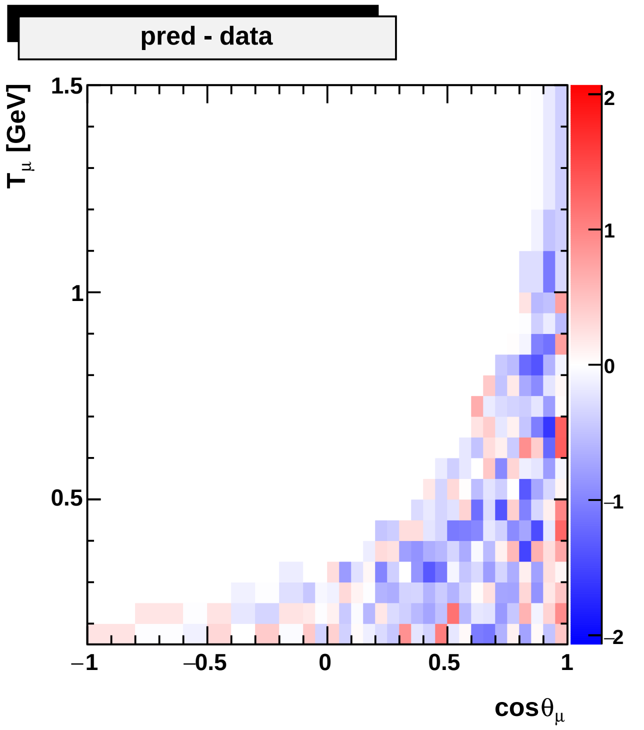
VS

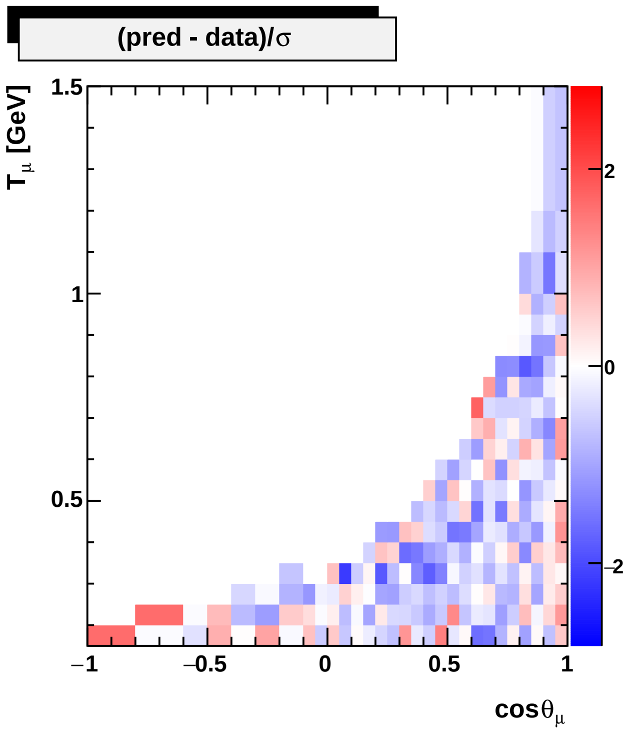
trunk:G00_00b:miniboone_fhc

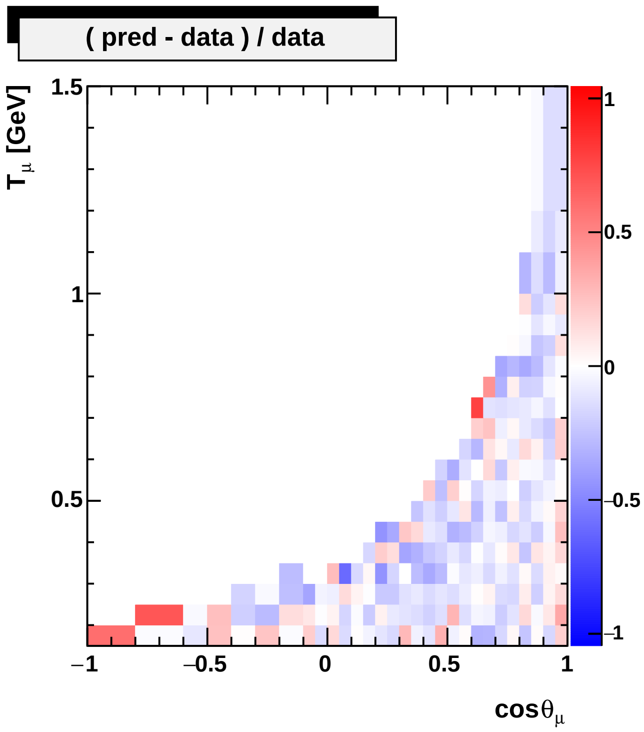
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$

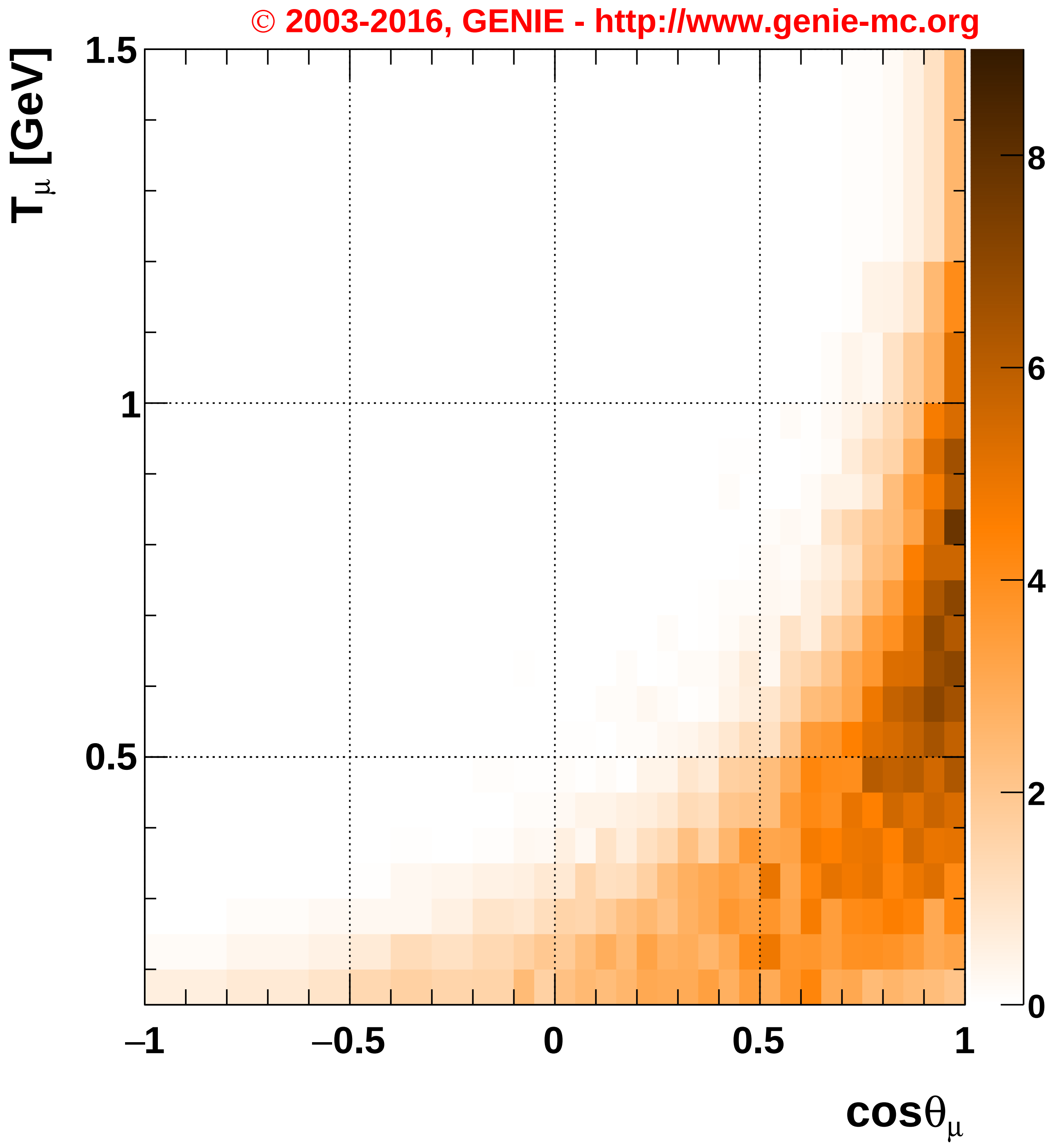
$[10^{-38}\ \mathrm{cm}^2/\mathrm{GeV}]$

χ^2 = 143.944/233 DoF









$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]

Pred: trunk:G16_01a:miniboone_fhc

miniboone_nucc1pip_2011

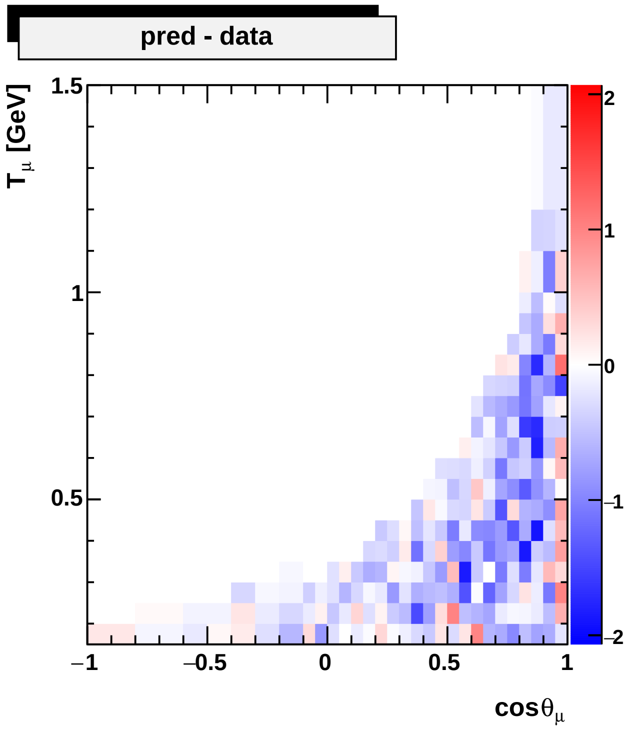
VS

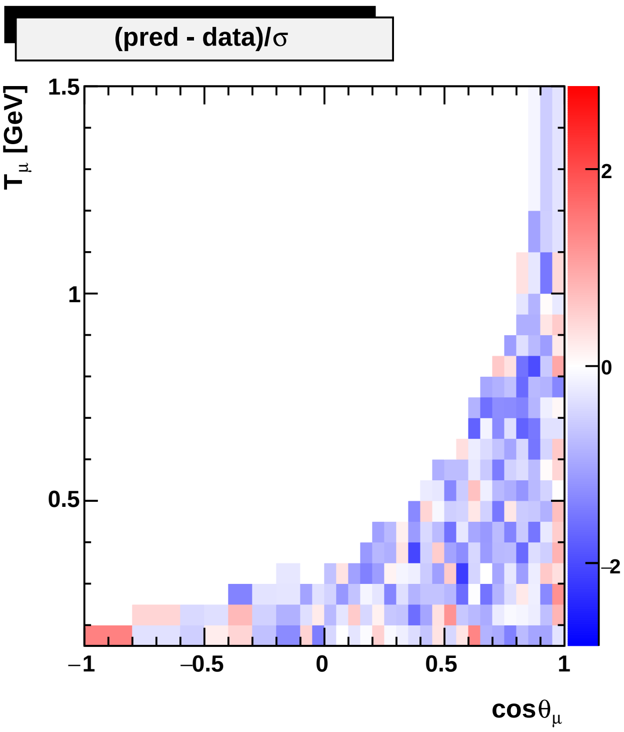
trunk:G16_01a:miniboone_fhc

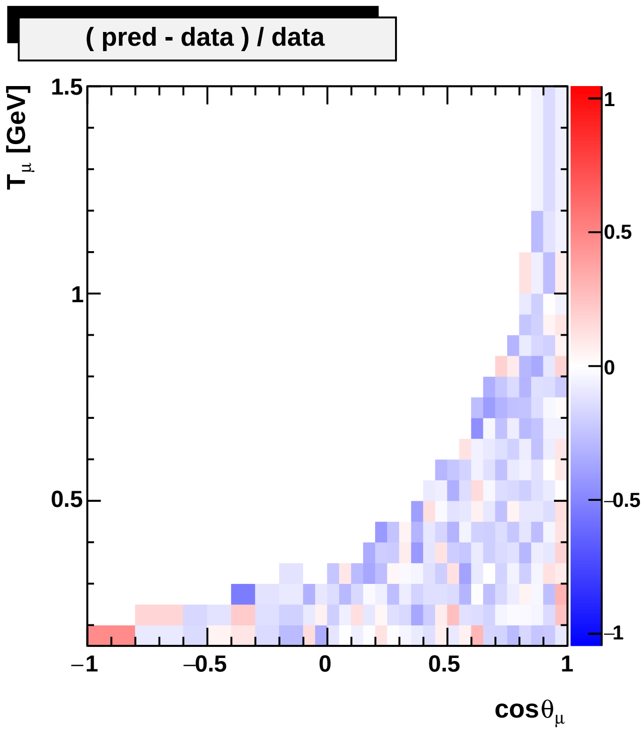
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$

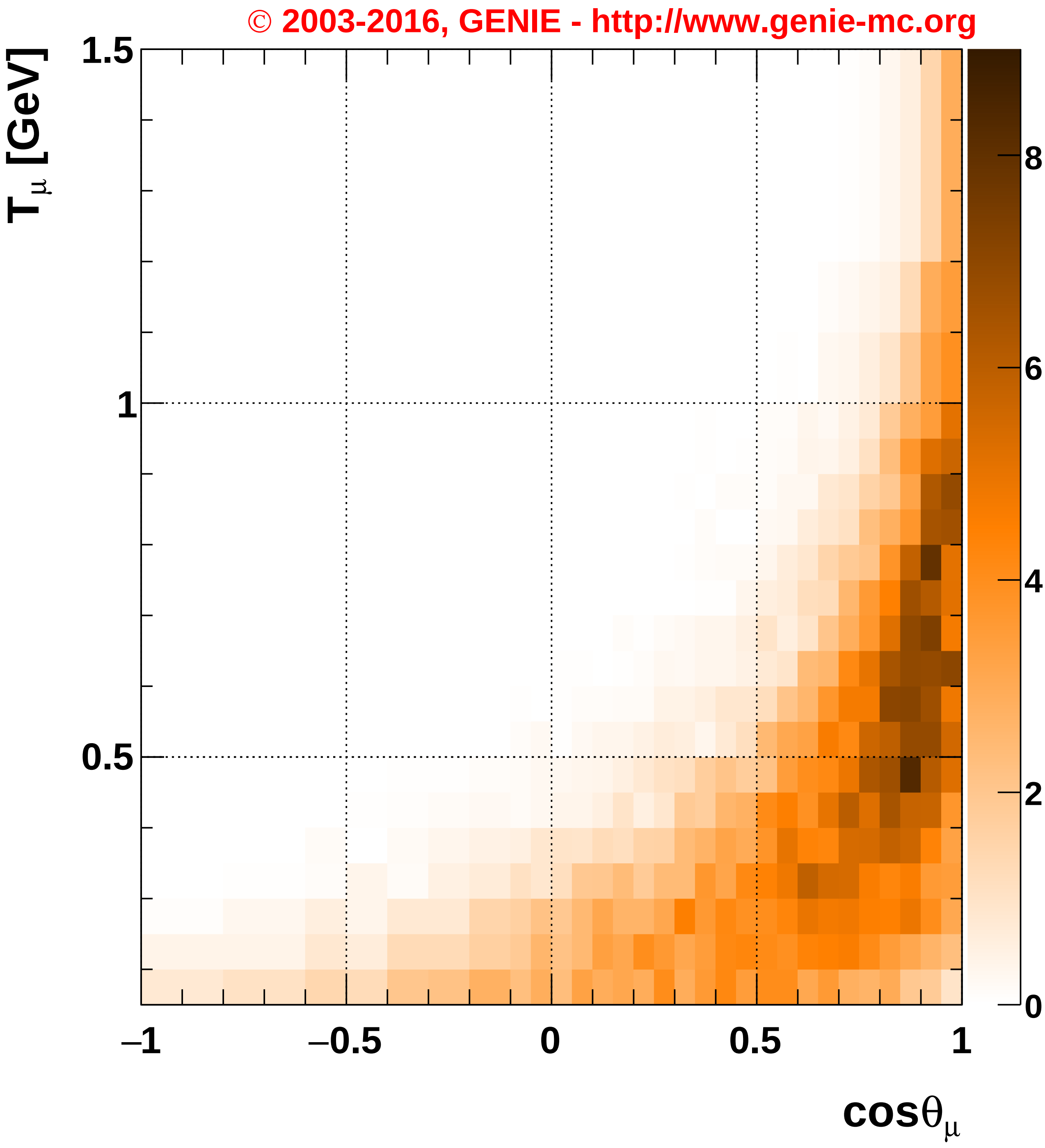
$[10^{-38}\ \mathrm{cm}^2/\mathrm{GeV}]$

χ^2 = 163.336/233 DoF









$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]

Pred: trunk:G16_02b:miniboone_fhc

miniboone_nucc1pip_2011

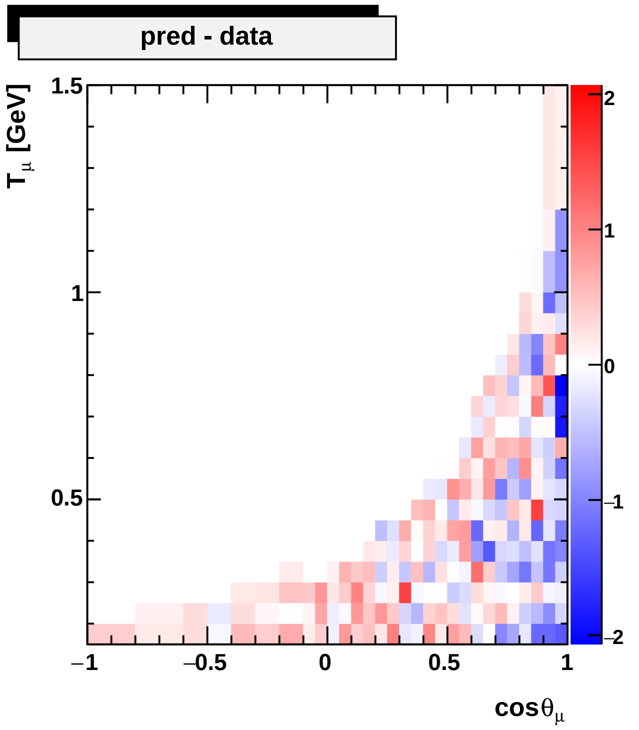
VS

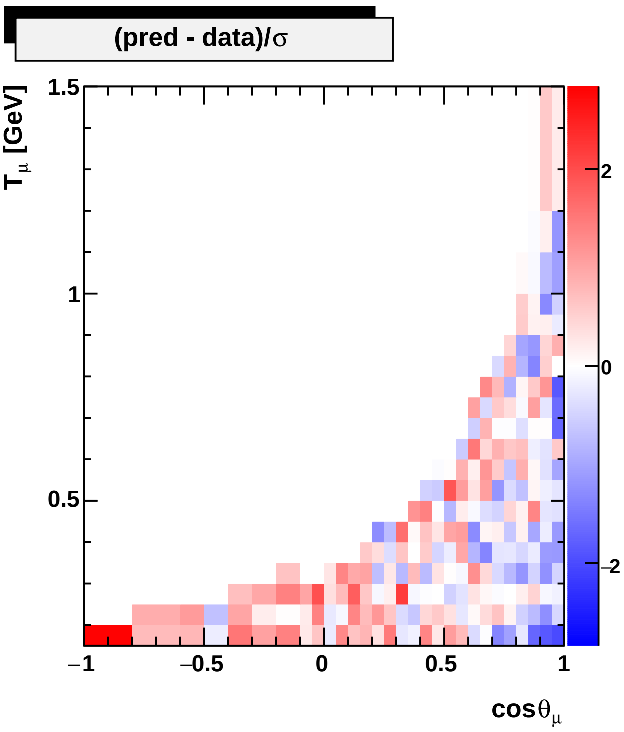
trunk:G16_02b:miniboone_fhc

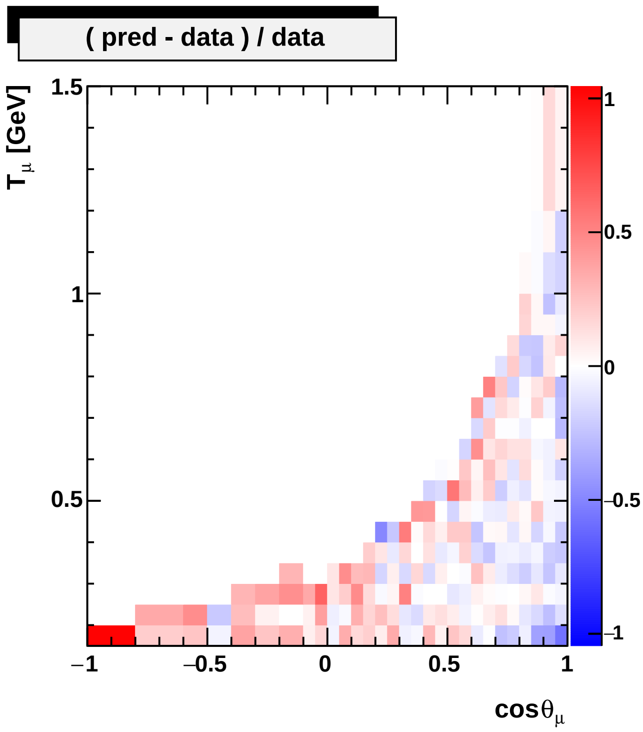
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$

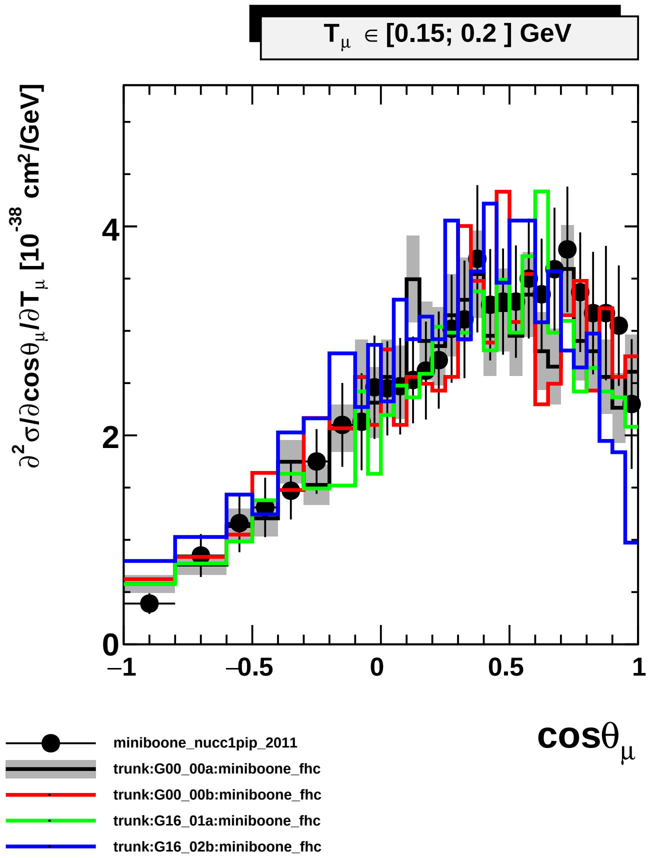
[10^{-38} cm^2/GeV]

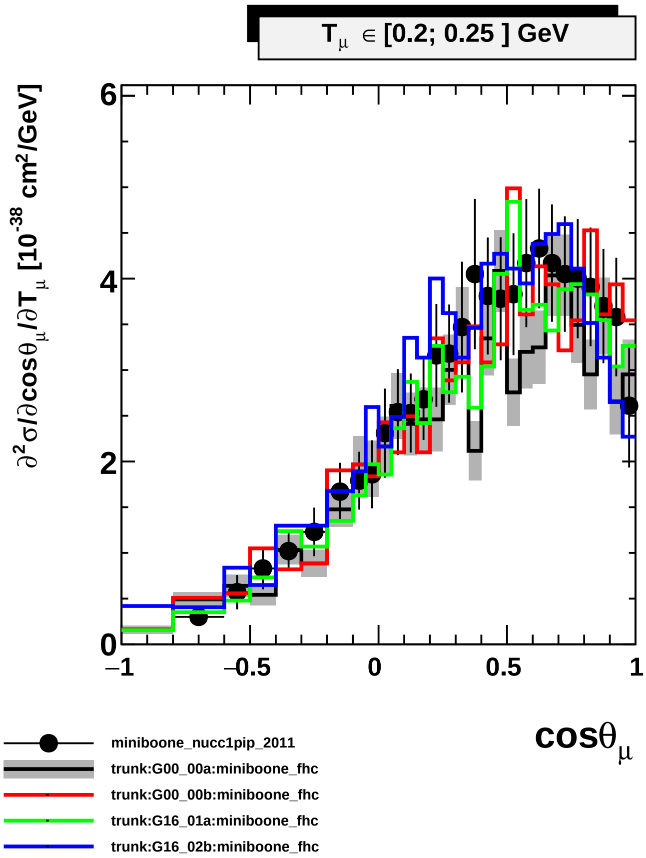
χ^2 = 159.702/233 DoF

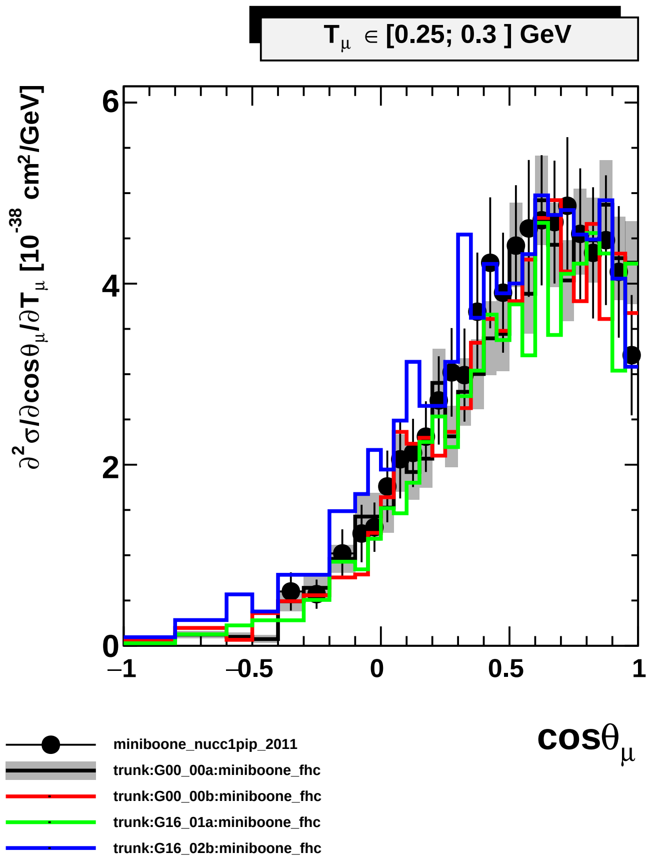


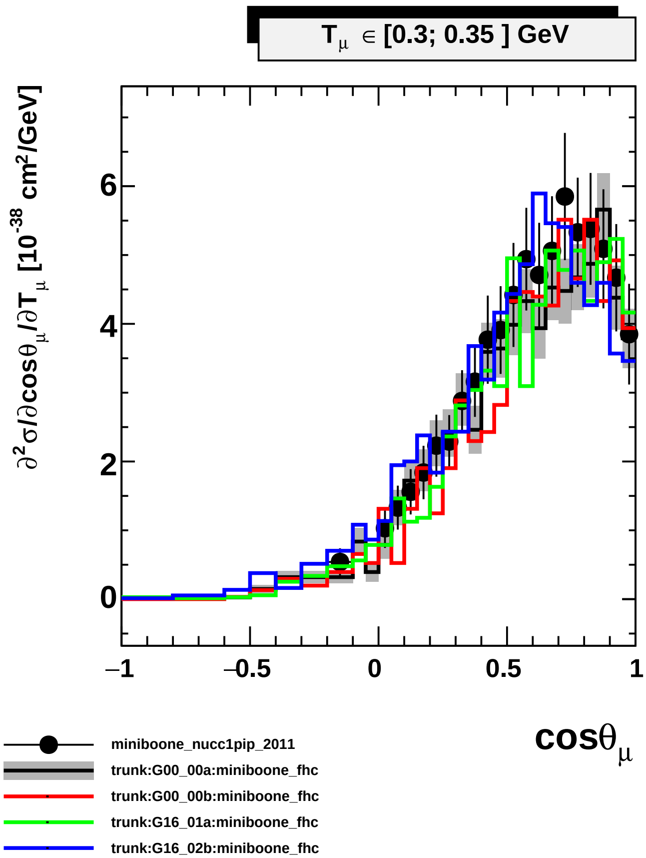


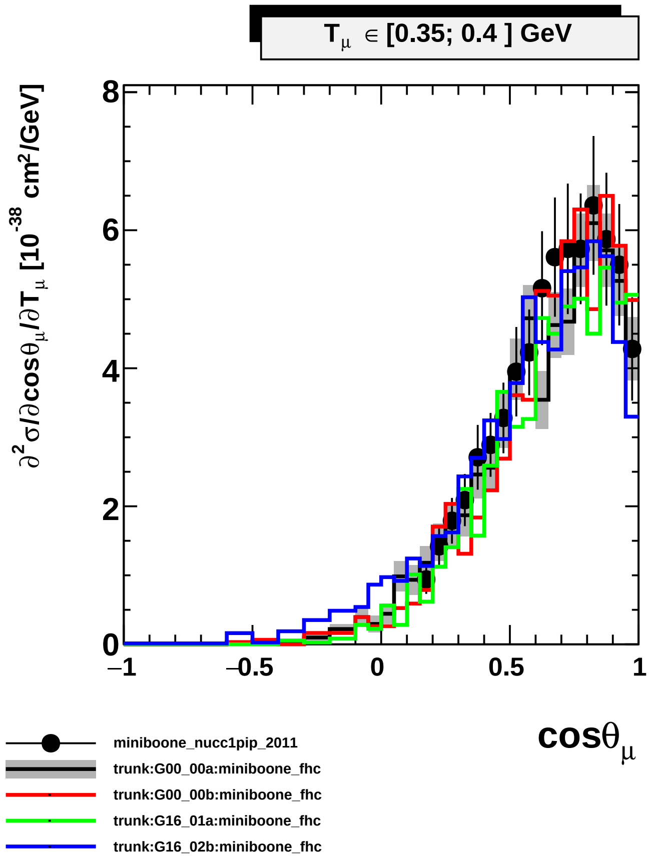



$T_\mu \in$ [0.15; 0.2] GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

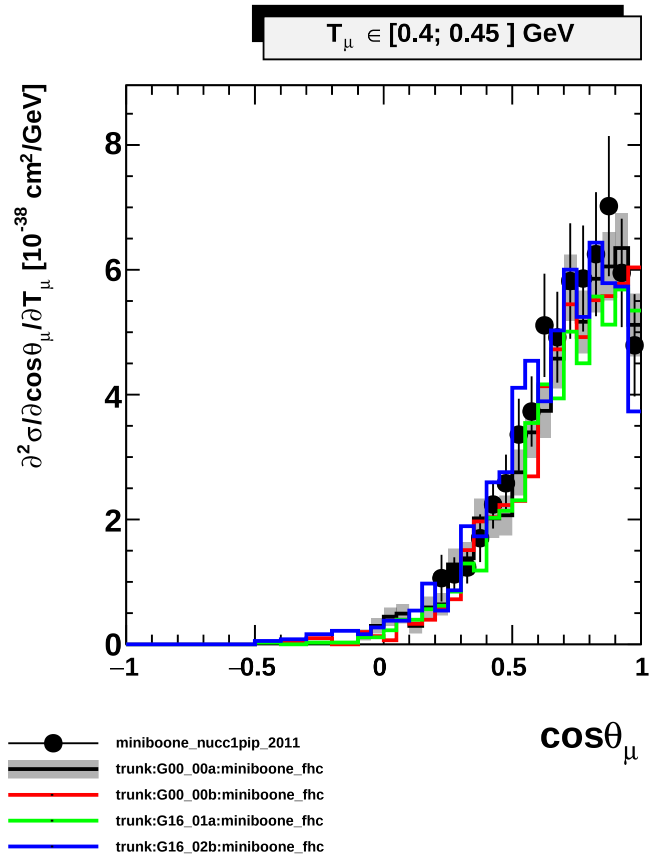

$T_\mu \in$ [0.2; 0.25] GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$T_\mu \in$ [0.25; 0.3] GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

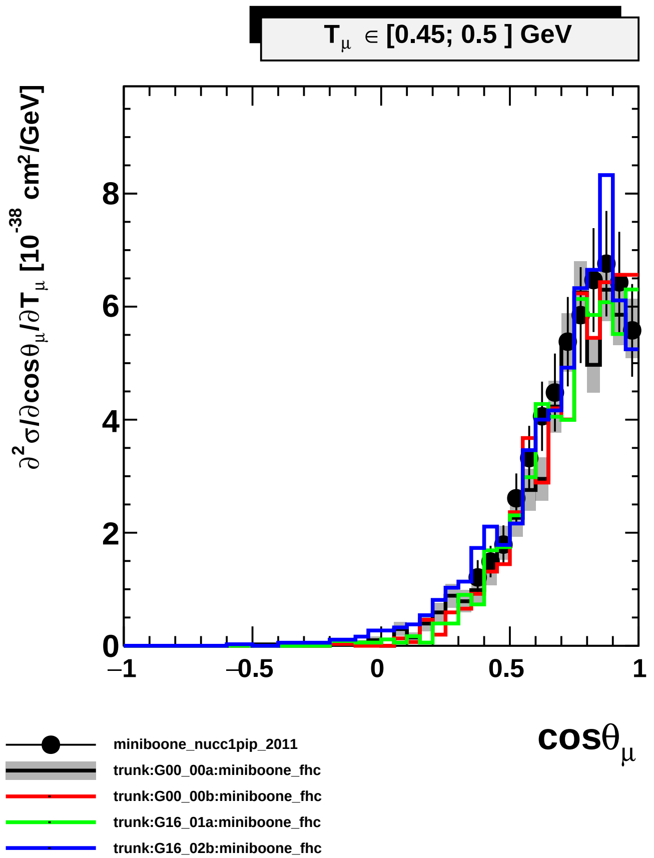

$T_\mu \in$ [0.3; 0.35] GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



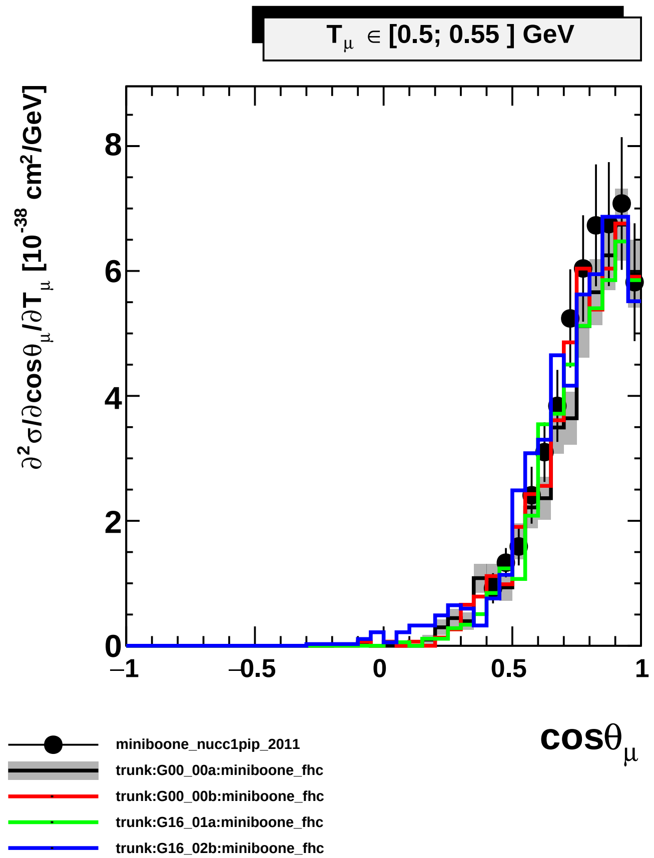
T_μ ∈ [0.35; 0.4] GeV
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
cosθ_μ
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



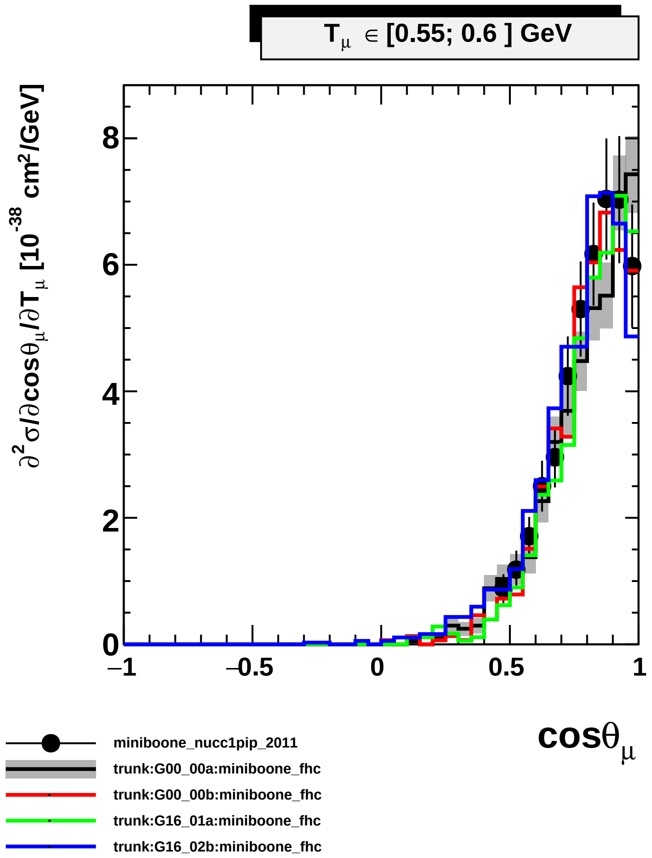
T_μ ∈ [0.4; 0.45] GeV
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
cosθ_μ
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



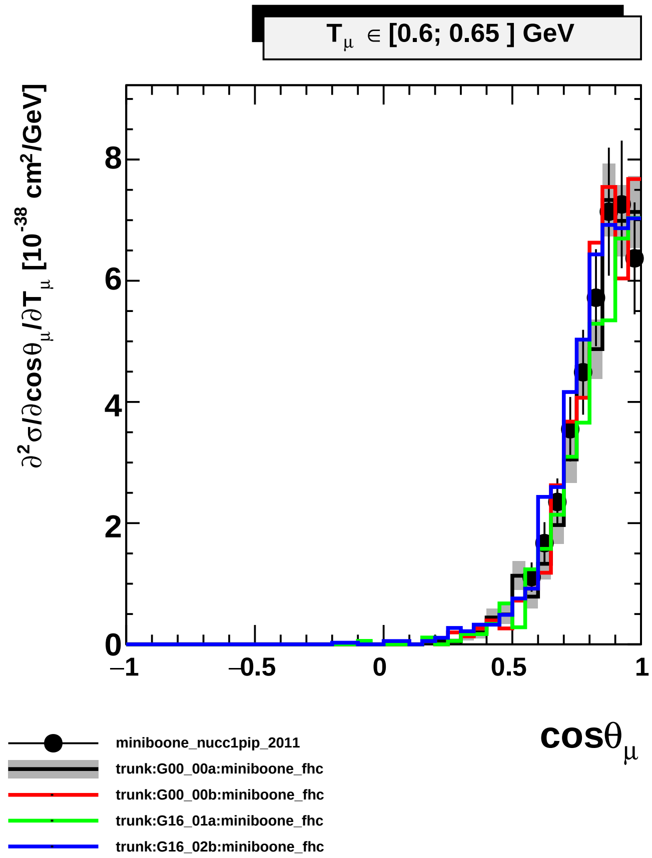
T_μ ∈ [0.45; 0.5] GeV
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
cosθ_μ
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



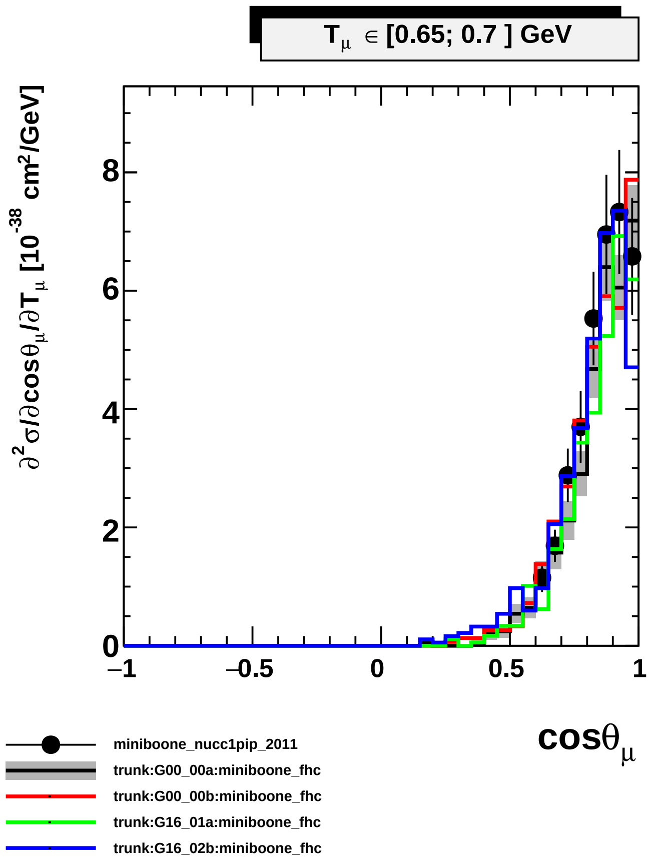
T_μ ∈ [0.5; 0.55] GeV
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
cosθ_μ
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



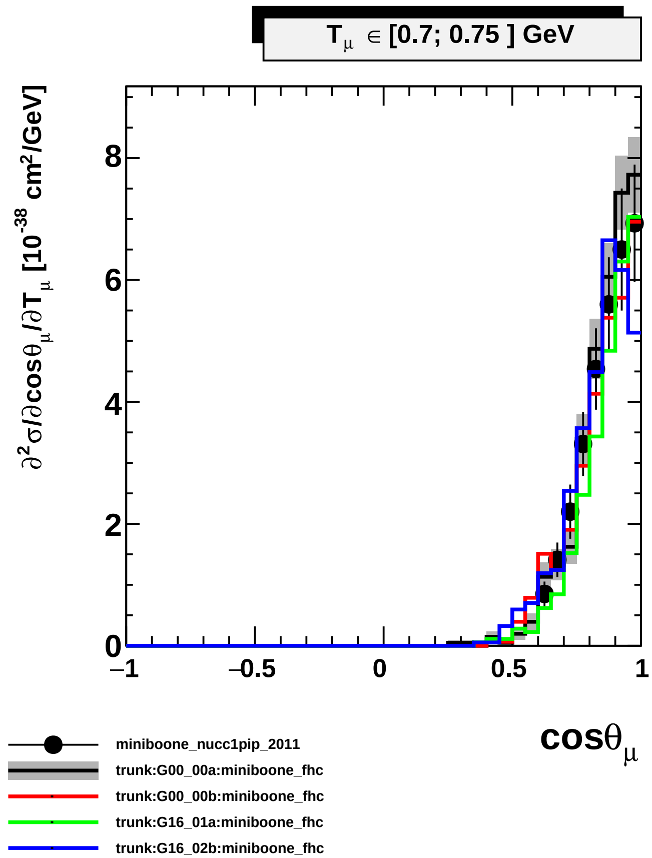
$T_\mu \in [0.55; 0.6\ ]$ GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu\ [10^{-38}\ \mathrm{cm^2/GeV}]$
0
2
4
6
8
–1
–0.5
0
0.5
1
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



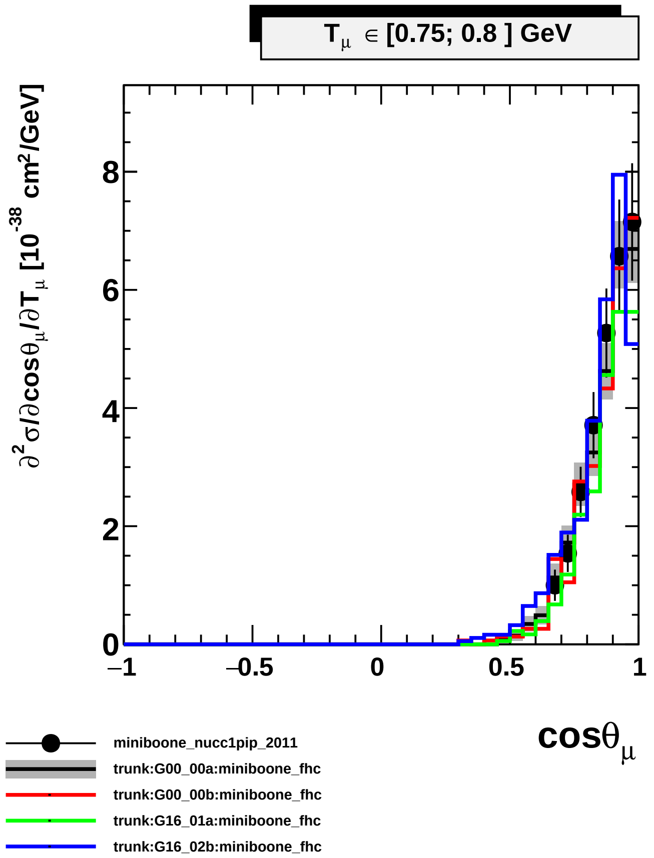
$T_\mu \in [0.6; 0.65\ ]$ GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu\ [10^{-38}\ \mathrm{cm^2/GeV}]$
0
2
4
6
8
–1
–0.5
0
0.5
1
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



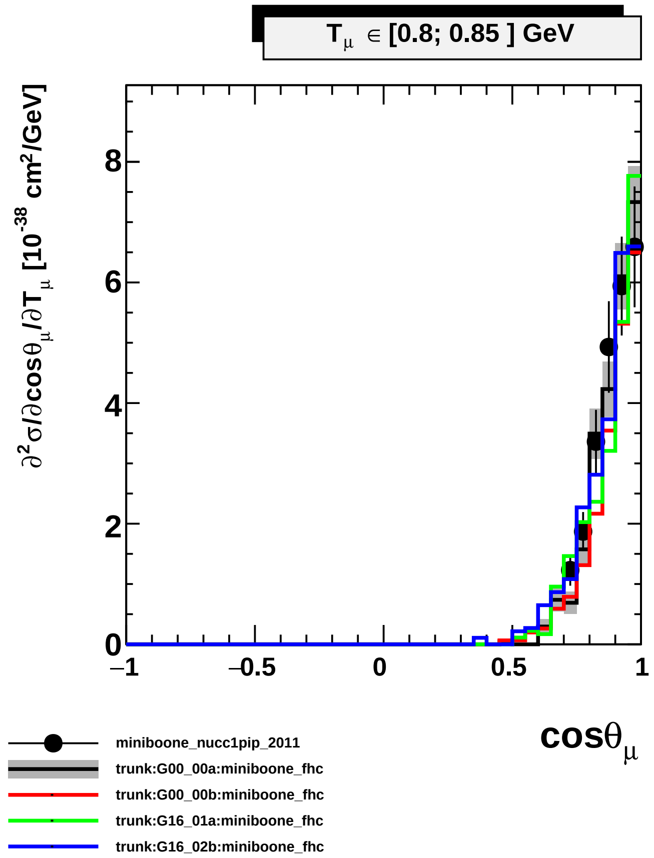
$T_\mu \in [0.65; 0.7\ ]$ GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu\ [10^{-38}\ \mathrm{cm^2/GeV}]$
0
2
4
6
8
–1
–0.5
0
0.5
1
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



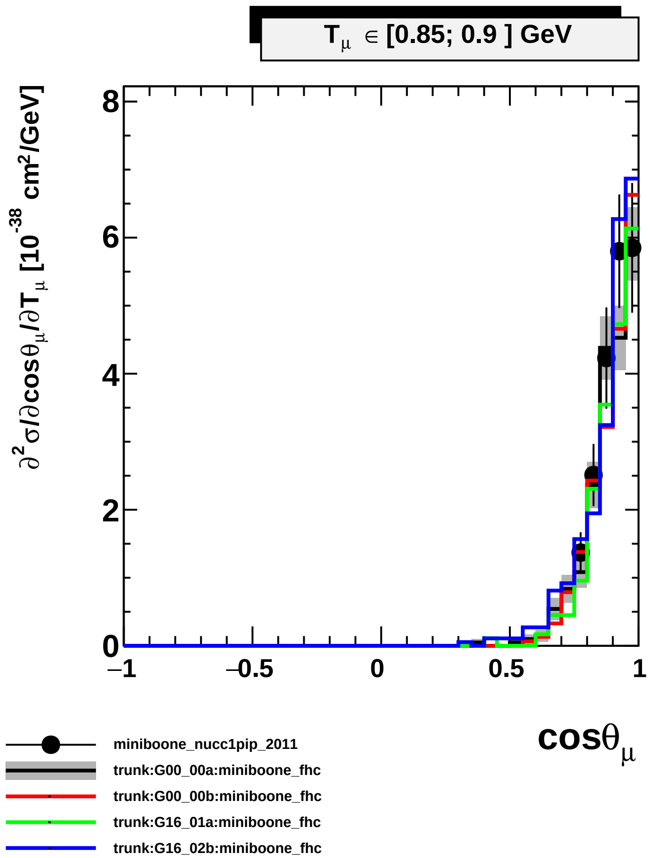
$T_\mu \in [0.7; 0.75\ ]$ GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu\ [10^{-38}\ \mathrm{cm^2/GeV}]$
0
2
4
6
8
–1
–0.5
0
0.5
1
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



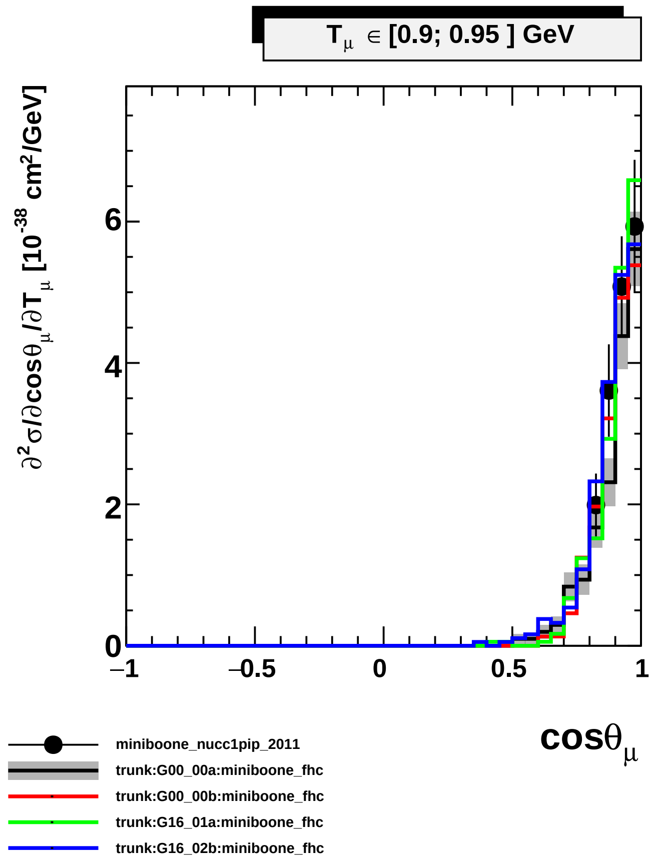
$T_\mu \in [0.75; 0.8]$ GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



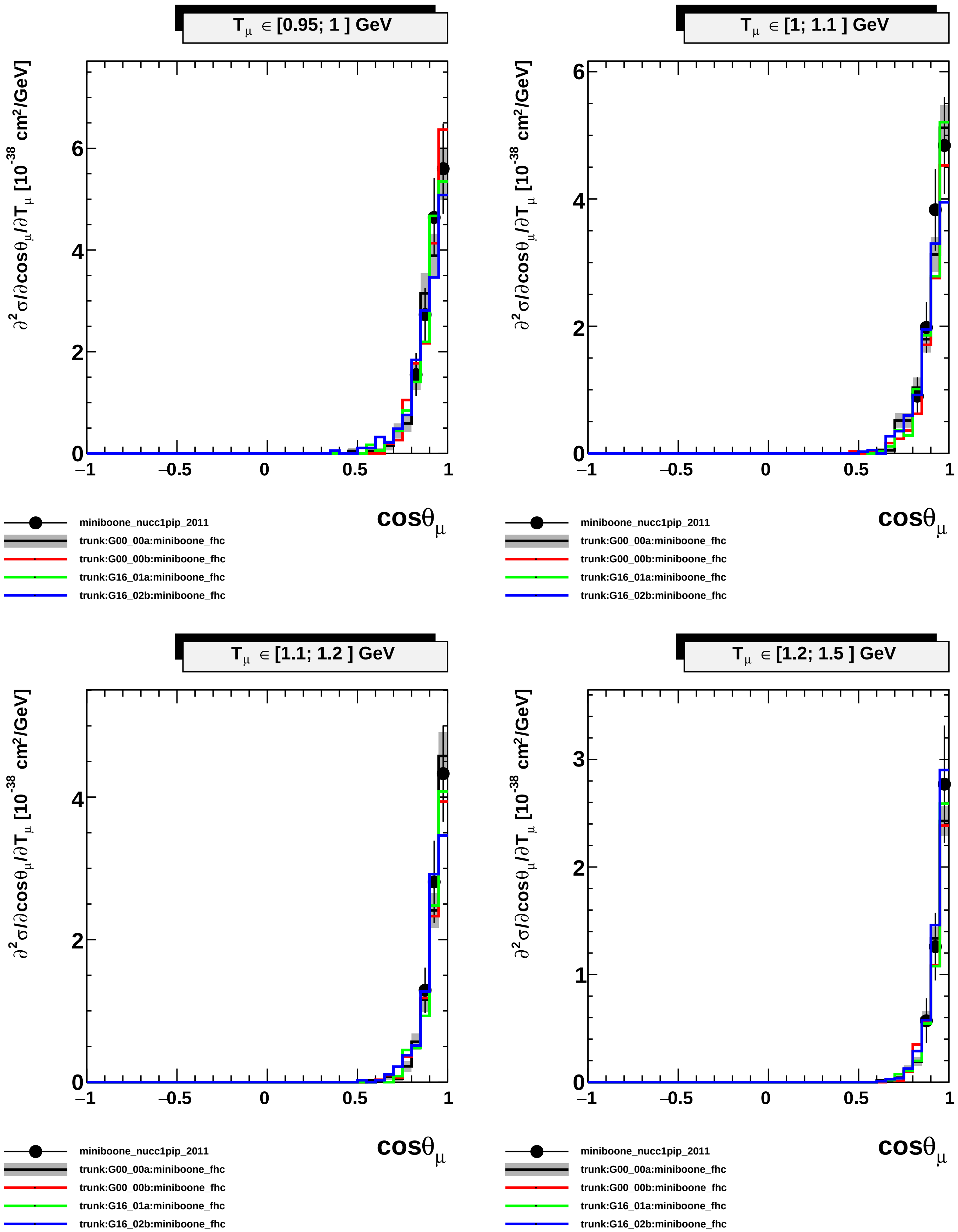
$T_\mu \in [0.8; 0.85]$ GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



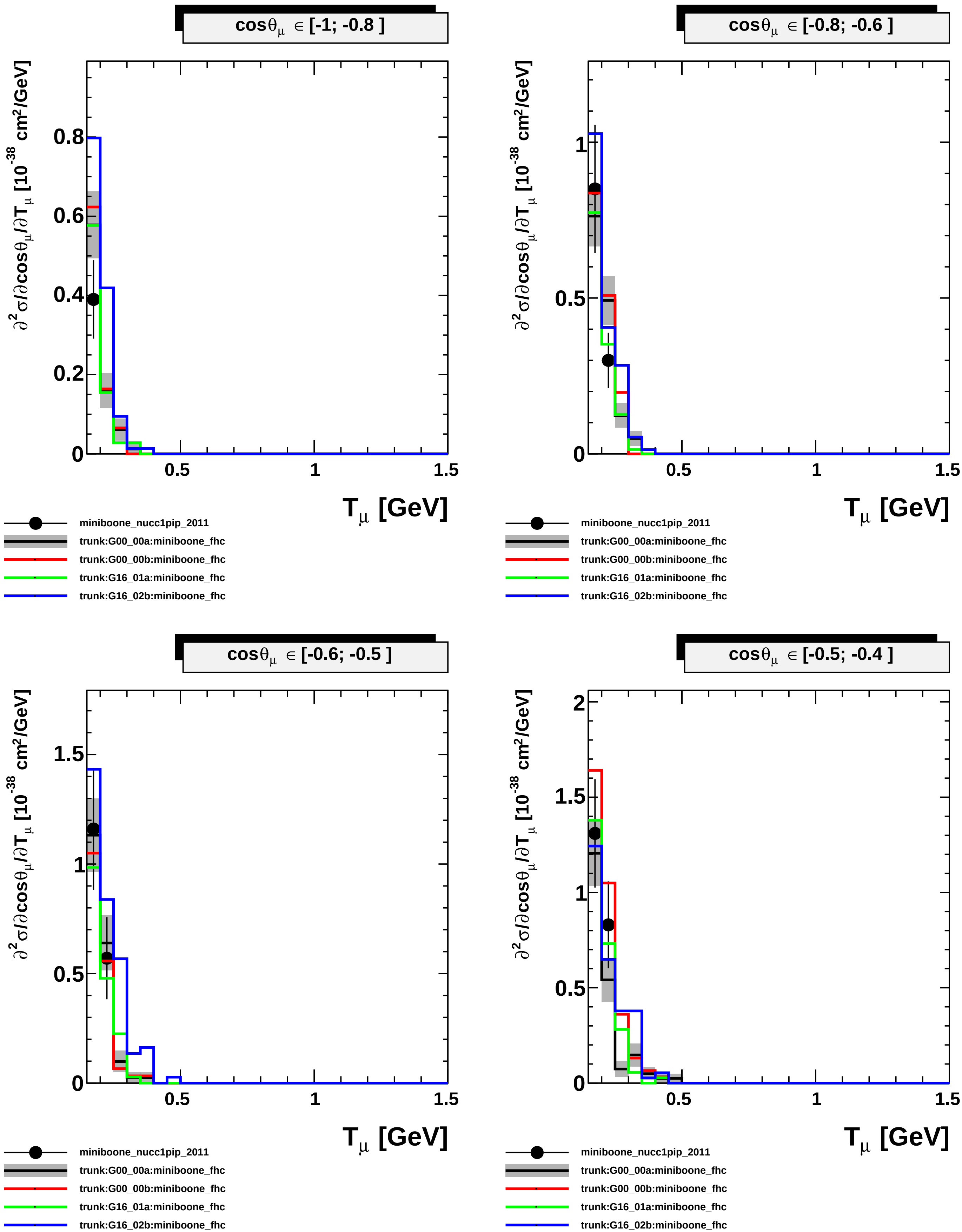
$T_\mu \in [0.85; 0.9]$ GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



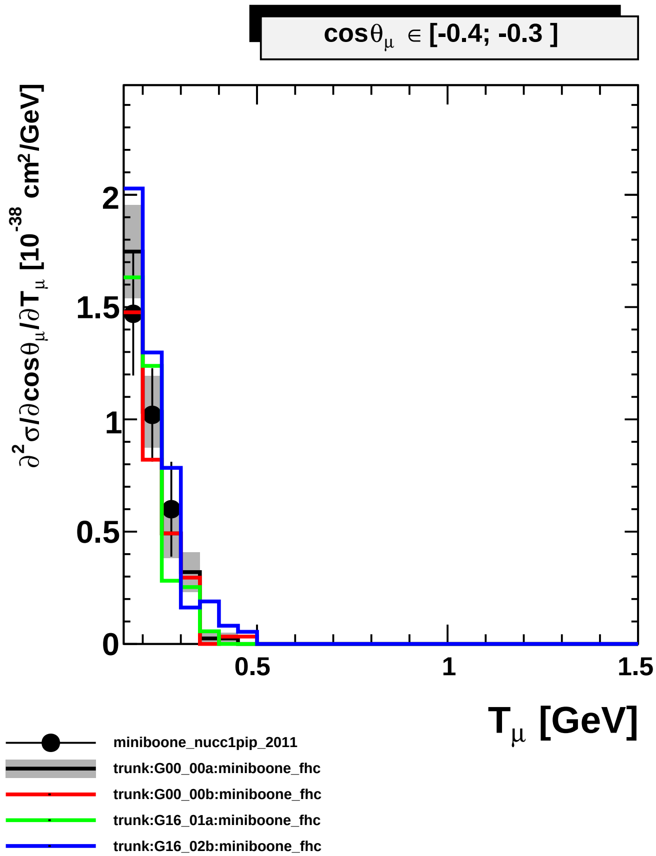
$T_\mu \in [0.9; 0.95]$ GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



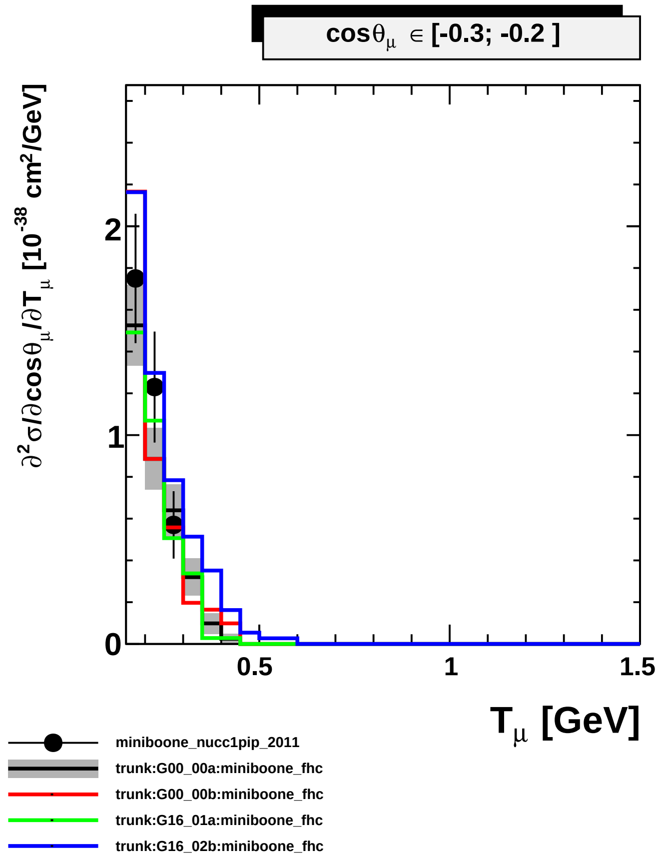
$T_\mu \in [0.95; 1\,]$ GeV
$T_\mu \in [1; 1.1\,]$ GeV
$T_\mu \in [1.1; 1.2\,]$ GeV
$T_\mu \in [1.2; 1.5\,]$ GeV
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
$\cos\theta_\mu$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



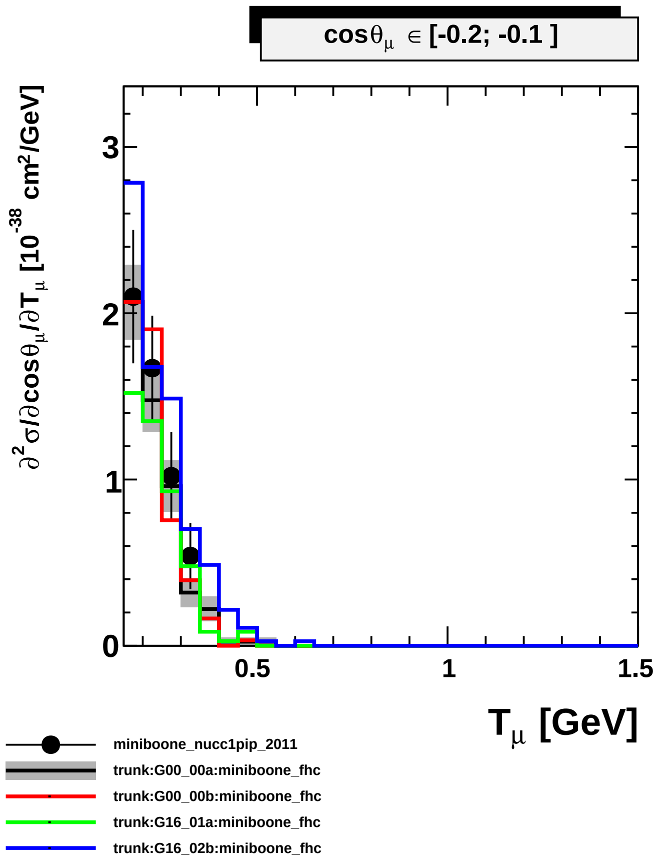
cosθμ ∈ [-1; -0.8]
cosθμ ∈ [-0.8; -0.6]
cosθμ ∈ [-0.6; -0.5]
cosθμ ∈ [-0.5; -0.4]
∂²σ/∂cosθμ/∂Tμ [10⁻³⁸ cm²/GeV]
Tμ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



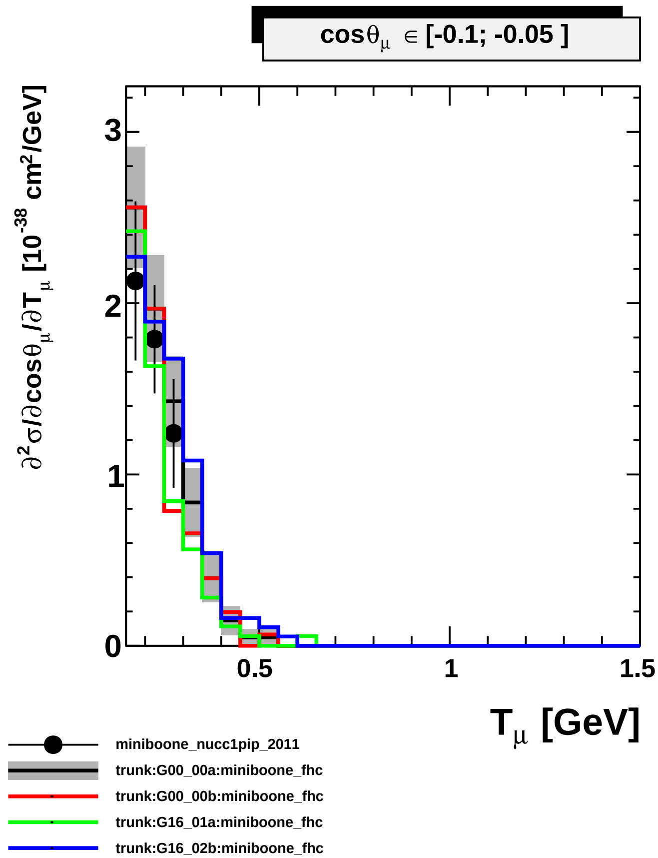
$\cos\theta_\mu \in$ [-0.4; -0.3]
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
0
0.5
1
1.5
2
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



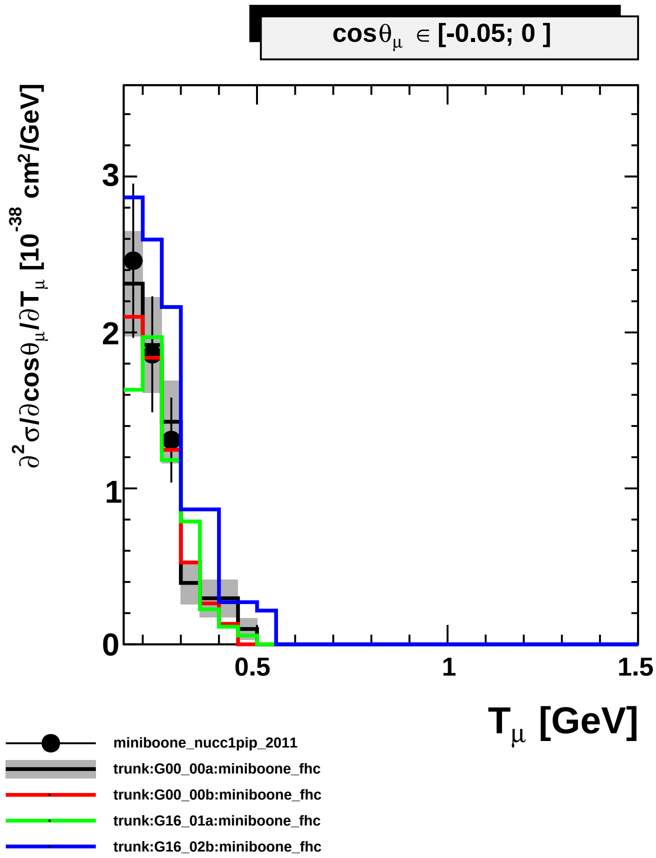
$\cos\theta_\mu \in$ [-0.3; -0.2]
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
0
1
2
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



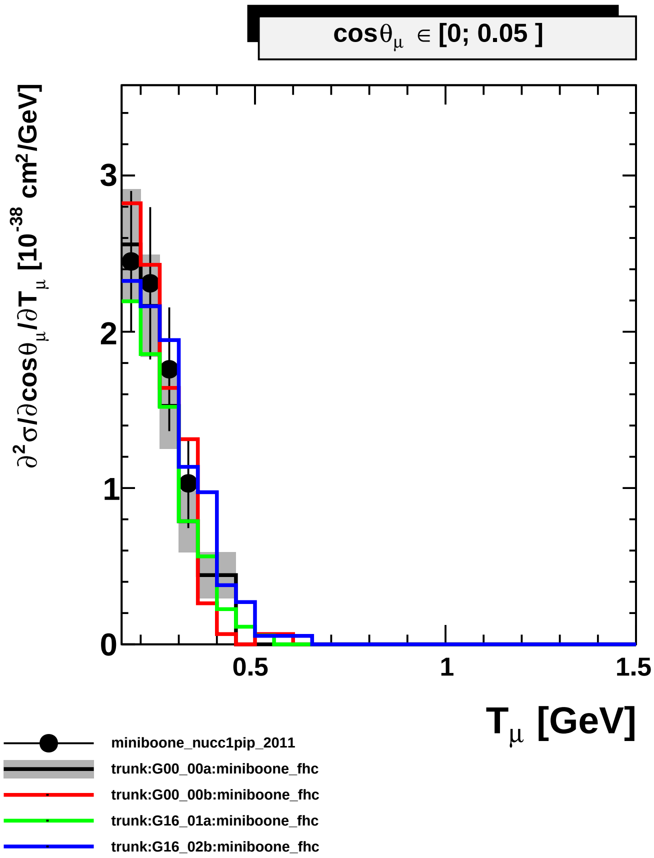
$\cos\theta_\mu \in$ [-0.2; -0.1]
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
0
1
2
3
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



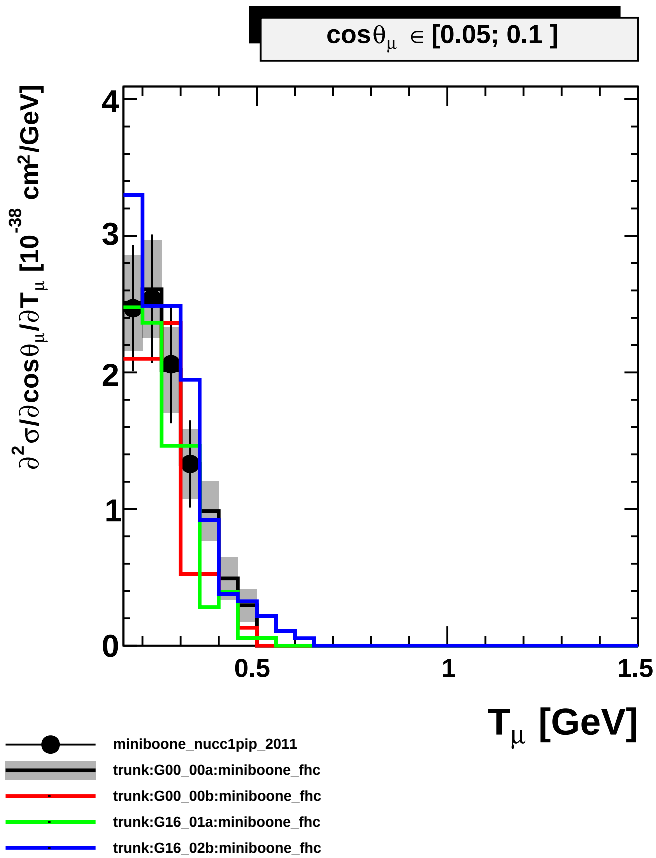
$\cos\theta_\mu \in$ [-0.1; -0.05]
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
0
1
2
3
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



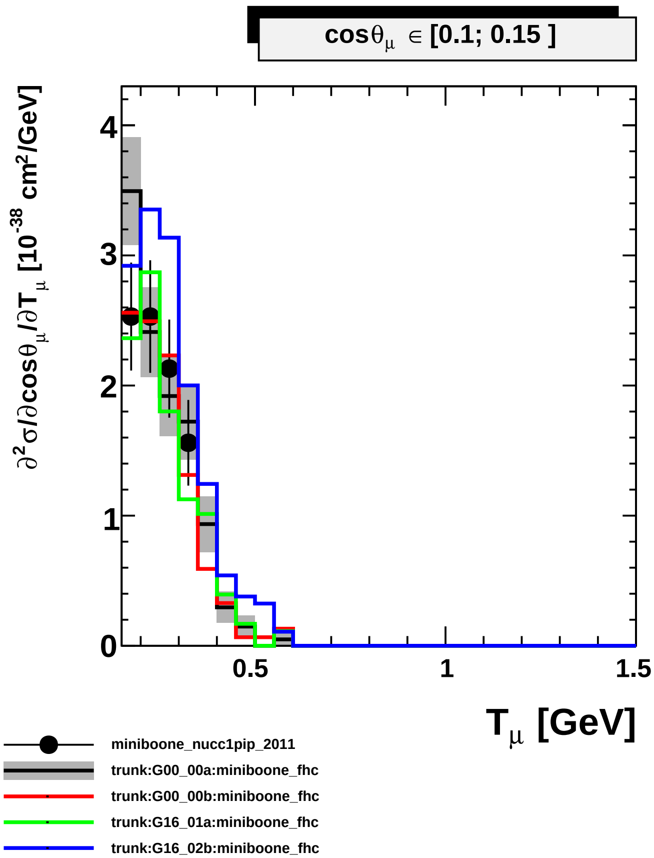
$\cos\theta_\mu \in [-0.05; 0\,]$
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



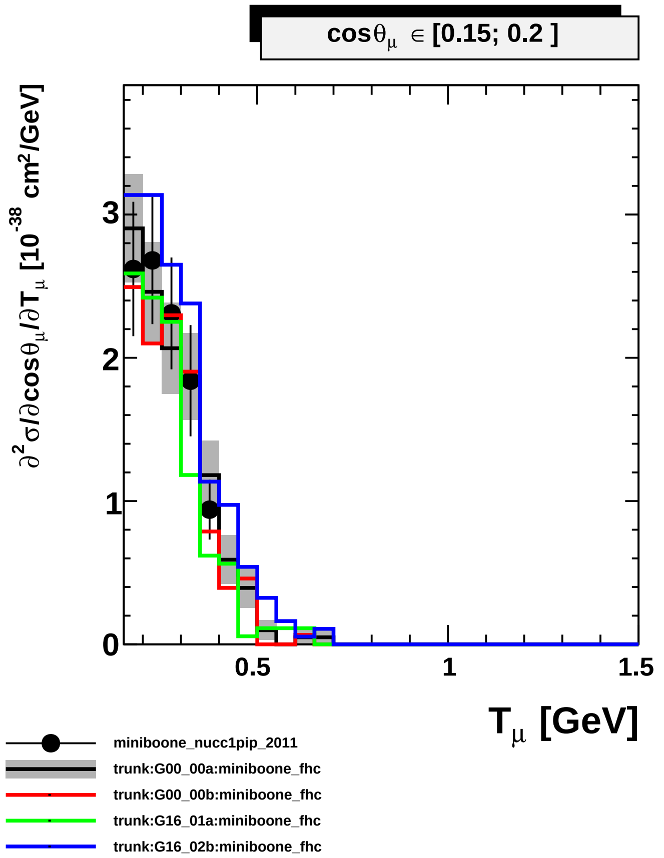
$\cos\theta_\mu \in [0; 0.05\,]$
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

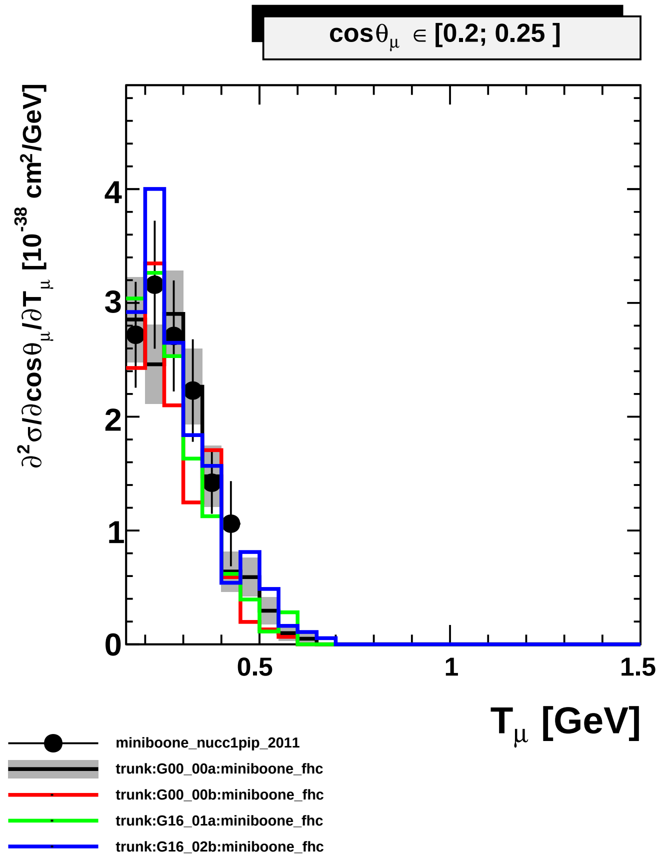


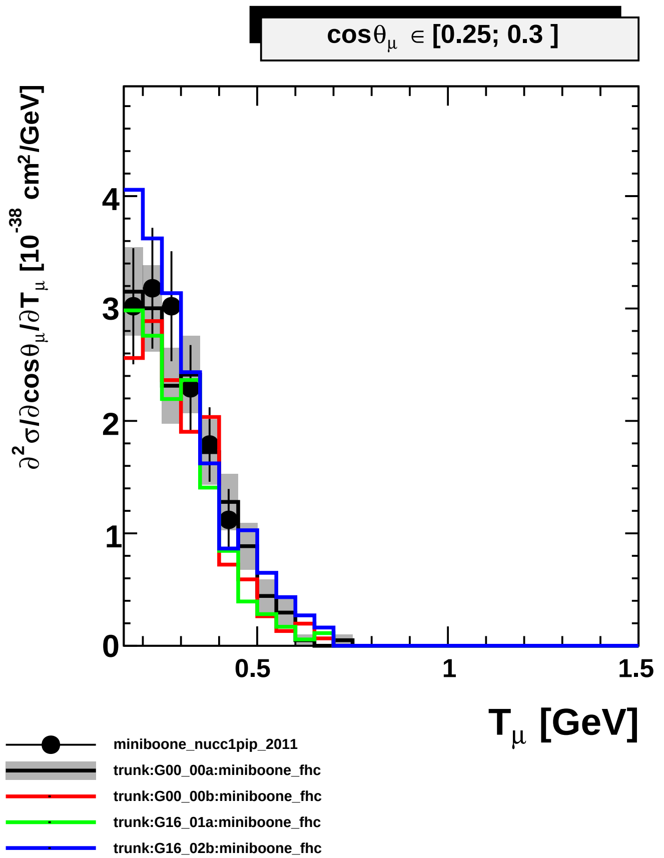
$\cos\theta_\mu \in [0.05; 0.1\,]$
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

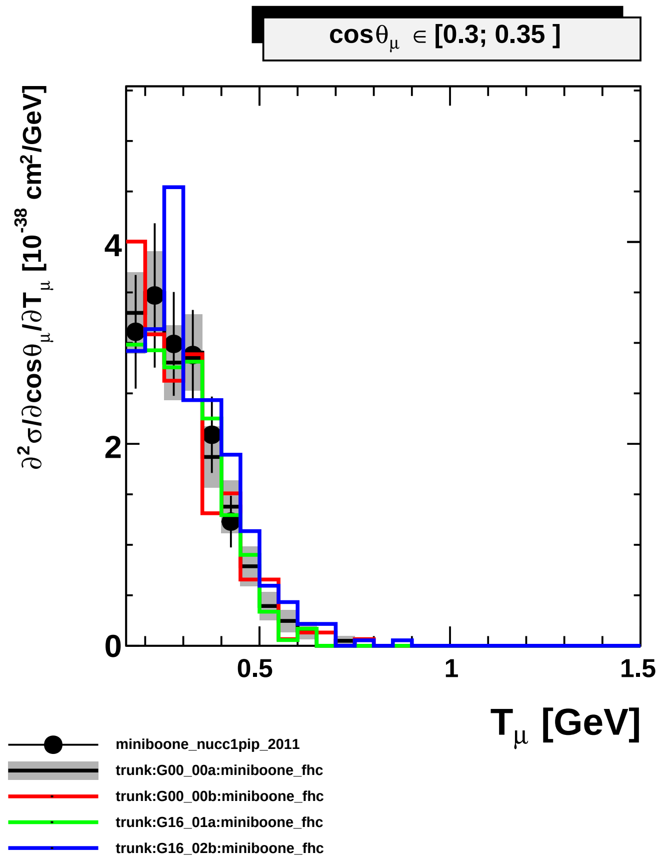


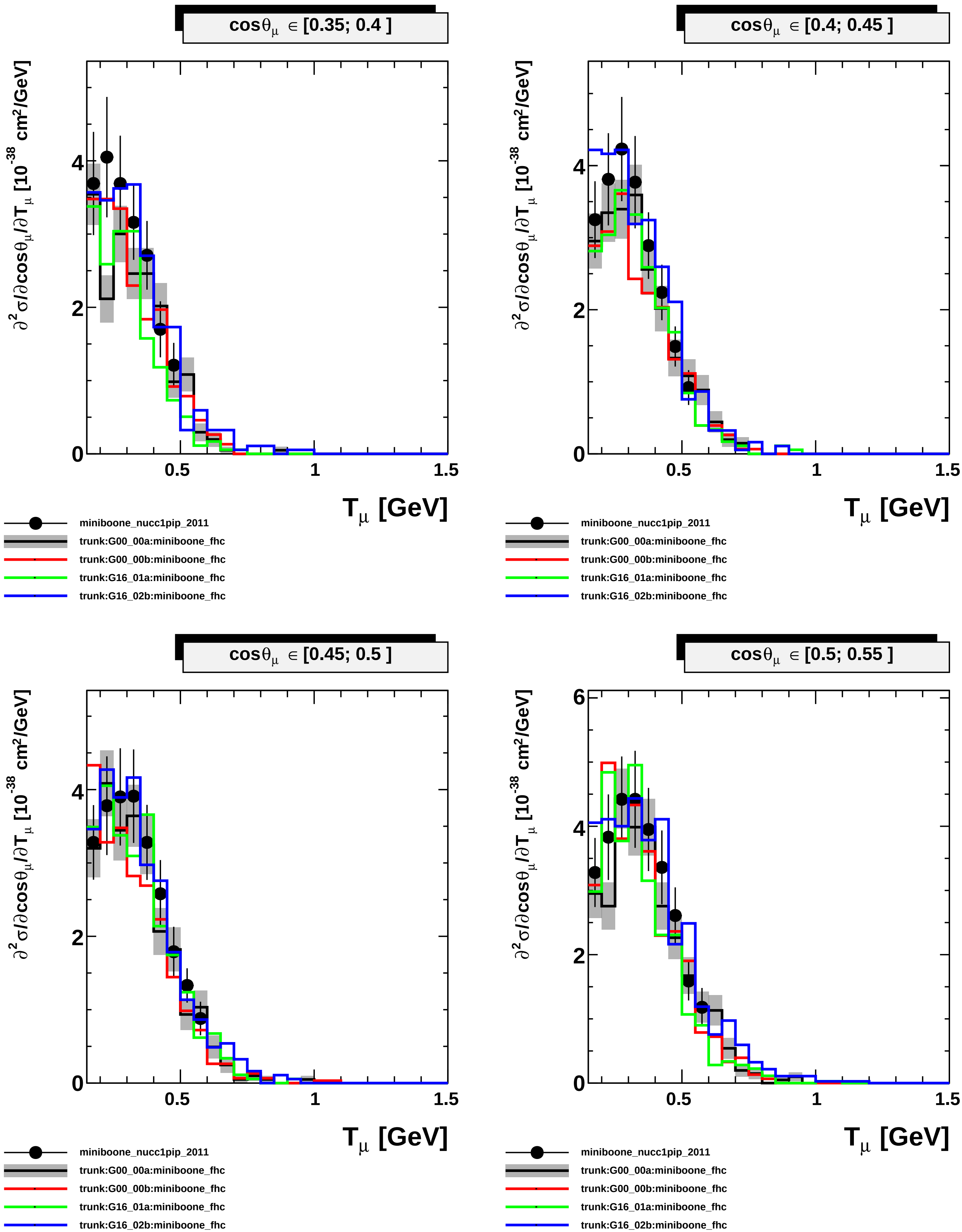
$\cos\theta_\mu \in [0.1; 0.15\,]$
$\partial^2\sigma/\partial\cos\theta_\mu/\partial T_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


cosθ_μ ∈ [0.15; 0.2]
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

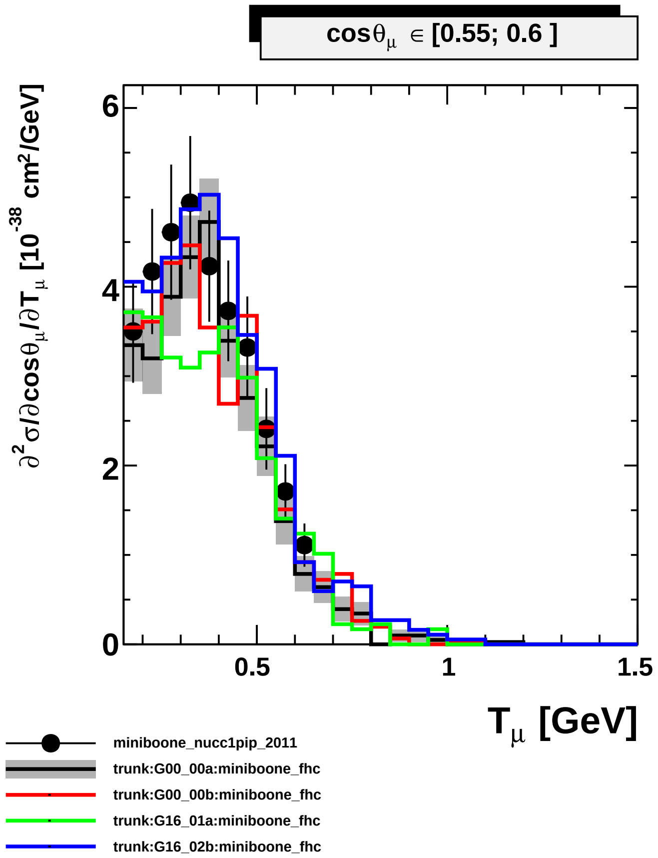

cosθ_μ ∈ [0.2; 0.25]
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

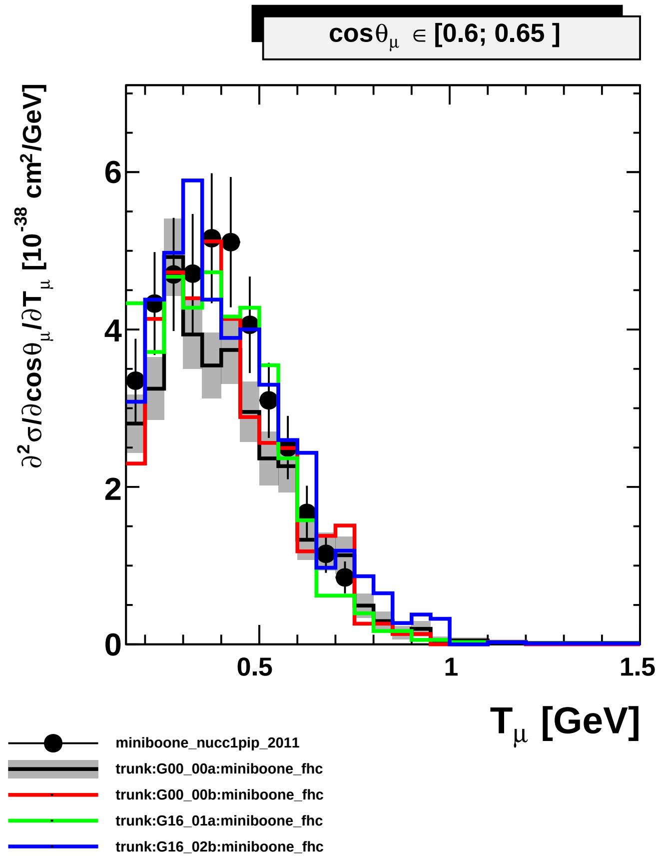

cosθ_μ ∈ [0.25; 0.3]
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

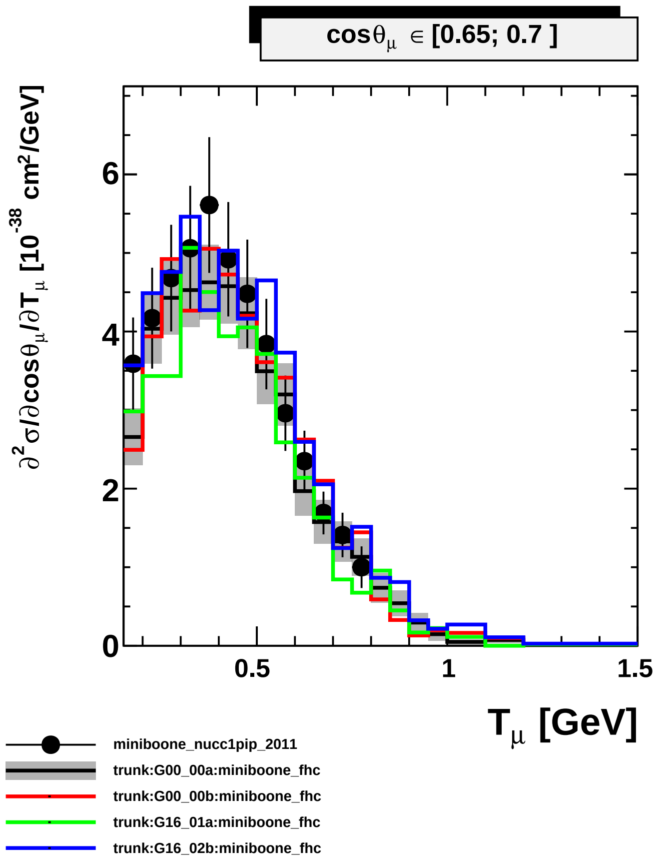

cosθ_μ ∈ [0.3; 0.35]
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

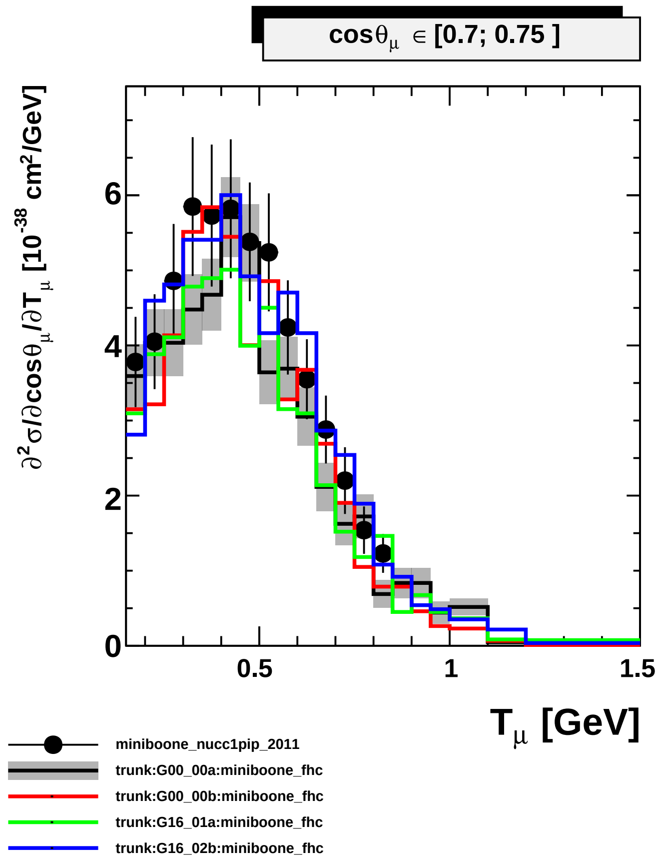


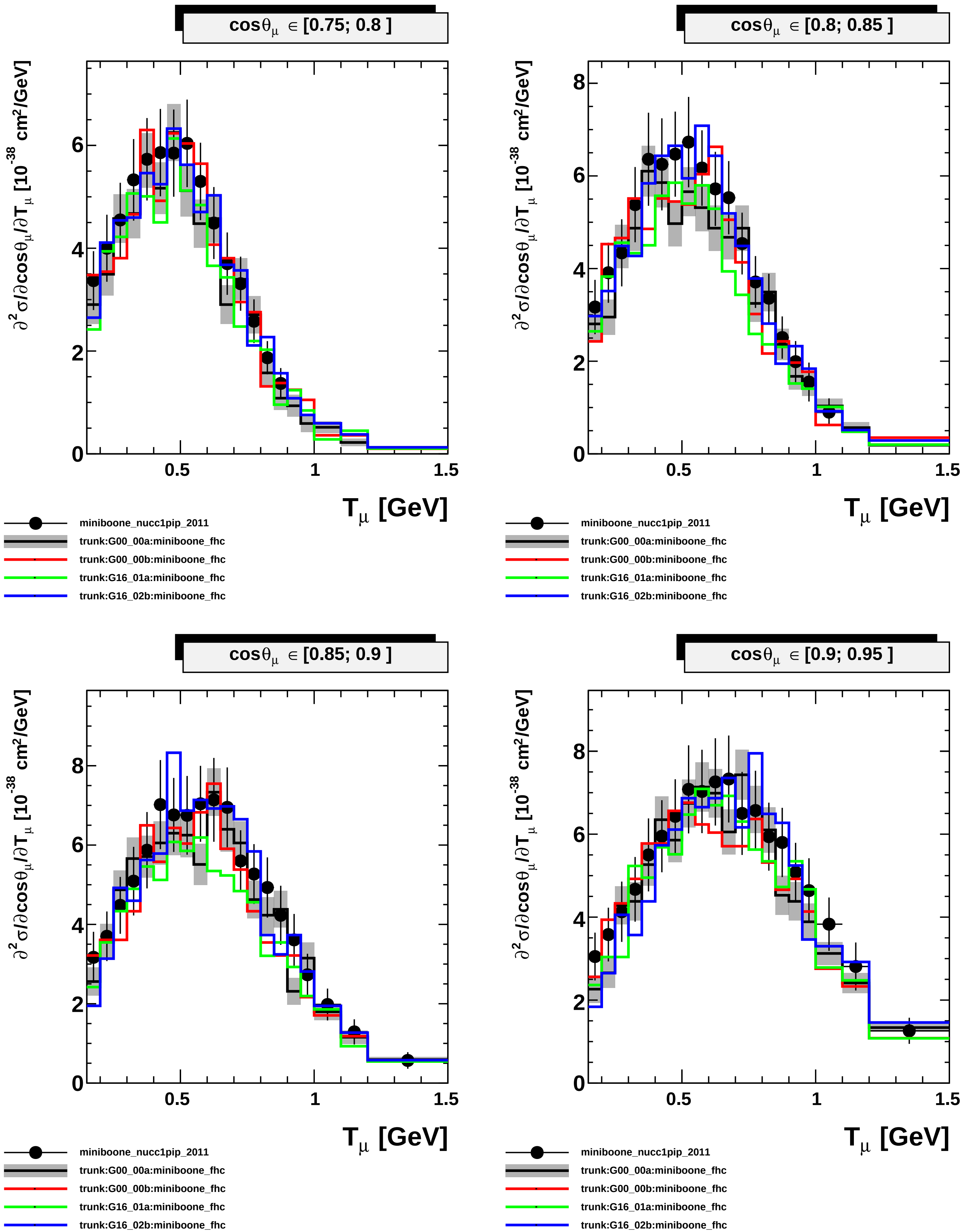
cosθ_μ ∈ [0.35; 0.4]
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
0
2
4
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc
cosθ_μ ∈ [0.4; 0.45]
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
0
2
4
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc
cosθ_μ ∈ [0.45; 0.5]
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
0
2
4
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc
cosθ_μ ∈ [0.5; 0.55]
∂²σ/∂cosθ_μ/∂T_μ [10⁻³⁸ cm²/GeV]
0
2
4
6
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


cosθ_μ ∈ [0.55; 0.6]
∂²σ/∂cosθ_μ/∂T_μ [10^-38 cm²/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

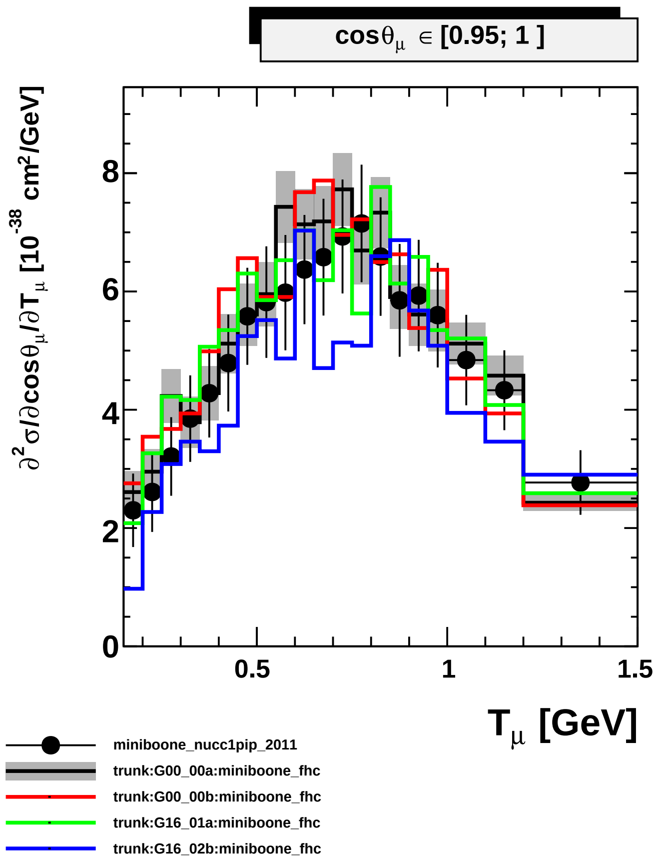

cosθ_μ ∈ [0.6; 0.65]
∂²σ/∂cosθ_μ/∂T_μ [10^-38 cm²/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


cosθ_μ ∈ [0.65; 0.7]
∂²σ/∂cosθ_μ/∂T_μ [10^-38 cm²/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

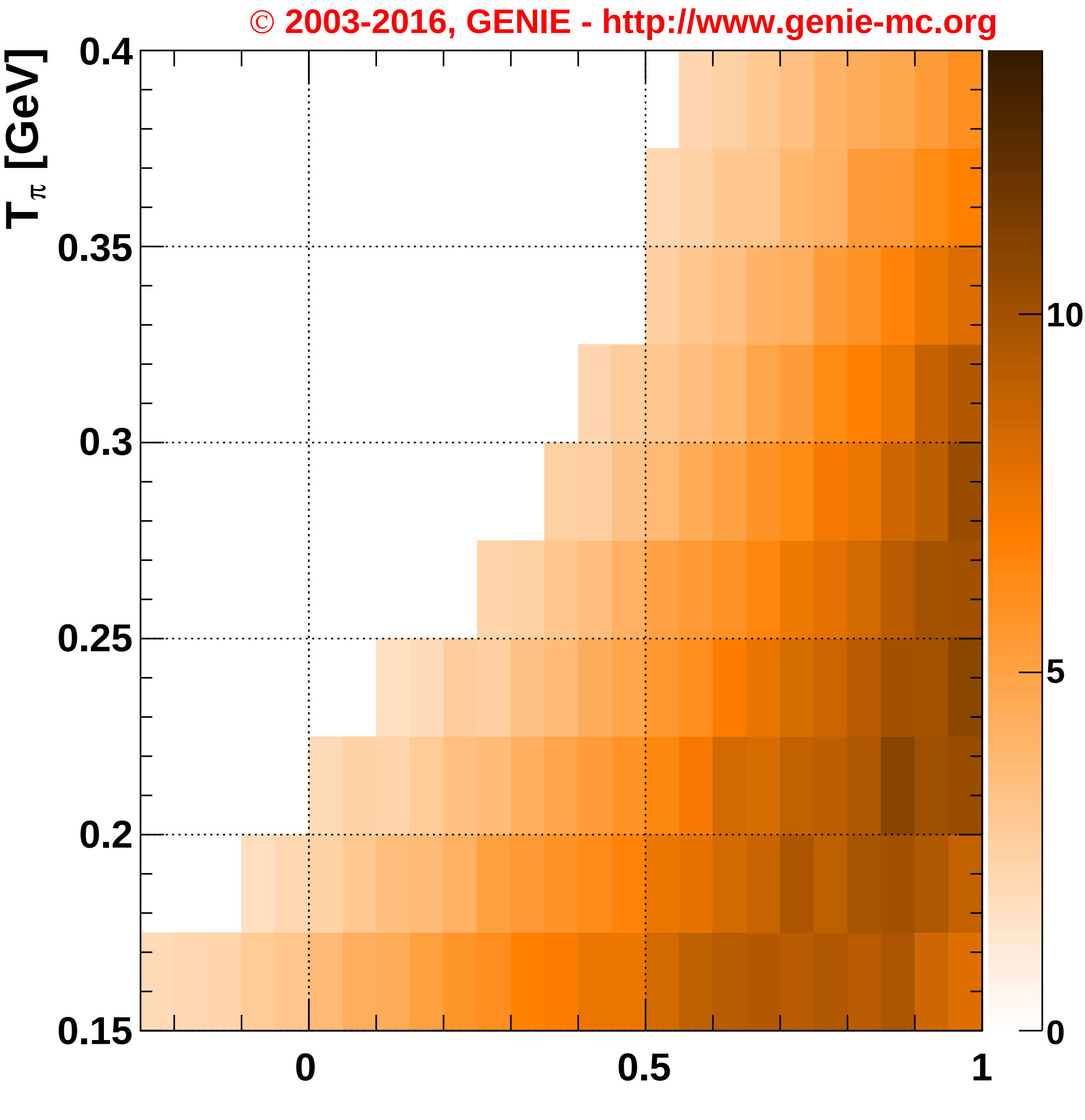

cosθ_μ ∈ [0.7; 0.75]
∂²σ/∂cosθ_μ/∂T_μ [10^-38 cm²/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



cosθ_μ ∈ [0.75; 0.8]
cosθ_μ ∈ [0.8; 0.85]
cosθ_μ ∈ [0.85; 0.9]
cosθ_μ ∈ [0.9; 0.95]
∂²σ/∂cosθ_μ/∂T_μ [10^-38 cm²/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

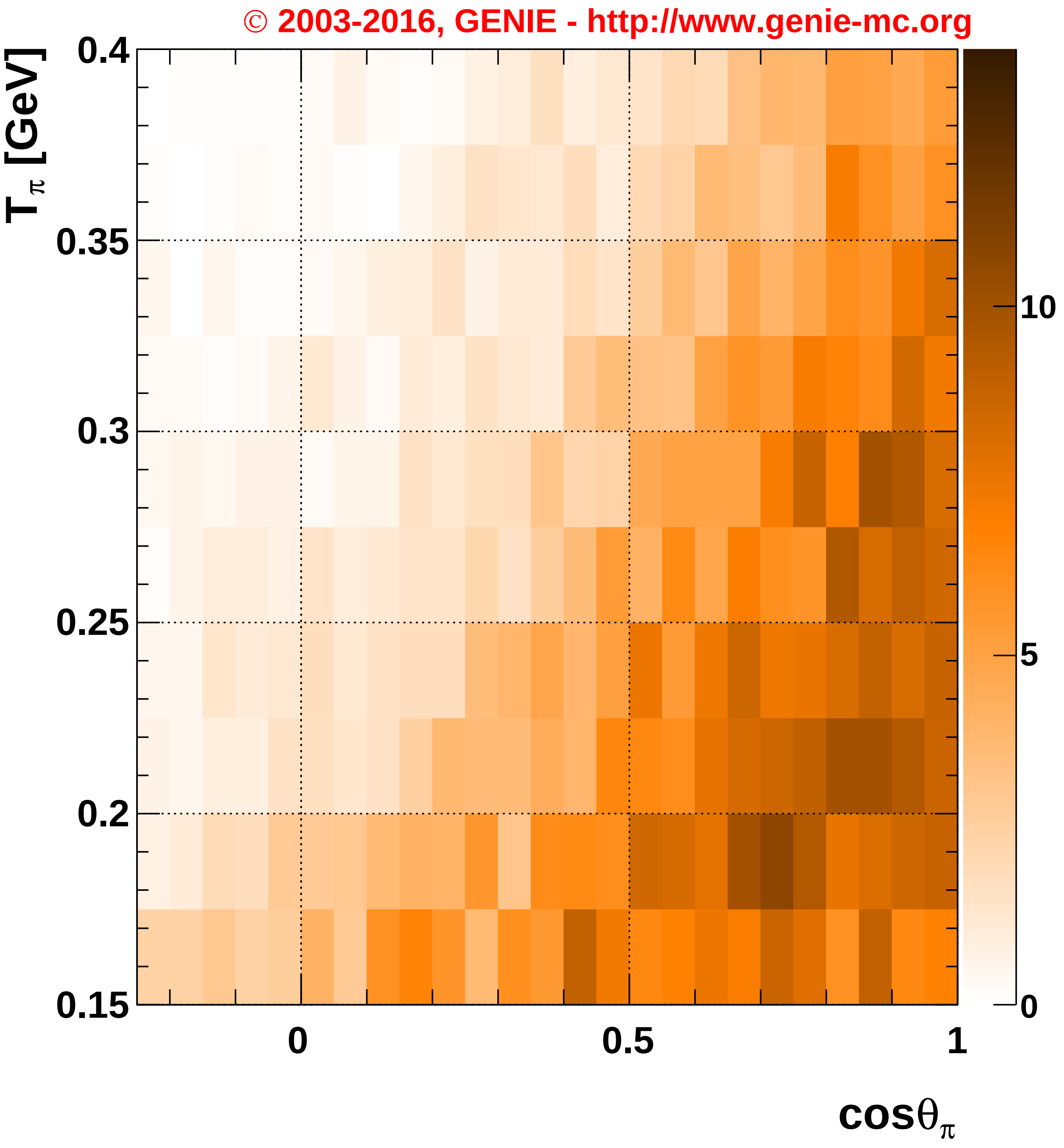


cosθ_μ ∈ [0.95; 1]
∂²σ/∂cosθ_μ/∂T_μ [10^-38 cm²/GeV]
T_μ [GeV]
0
2
4
6
8
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]

Data: miniboone_nucc1pip_2011



$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm²/GeV]

Pred: trunk:G00_00a:miniboone_fhc

miniboone_nucc1pip_2011

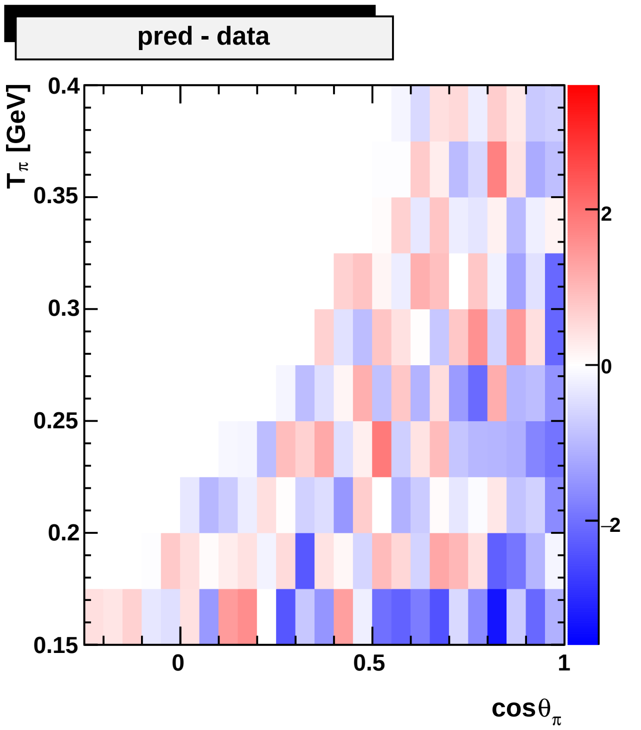
VS

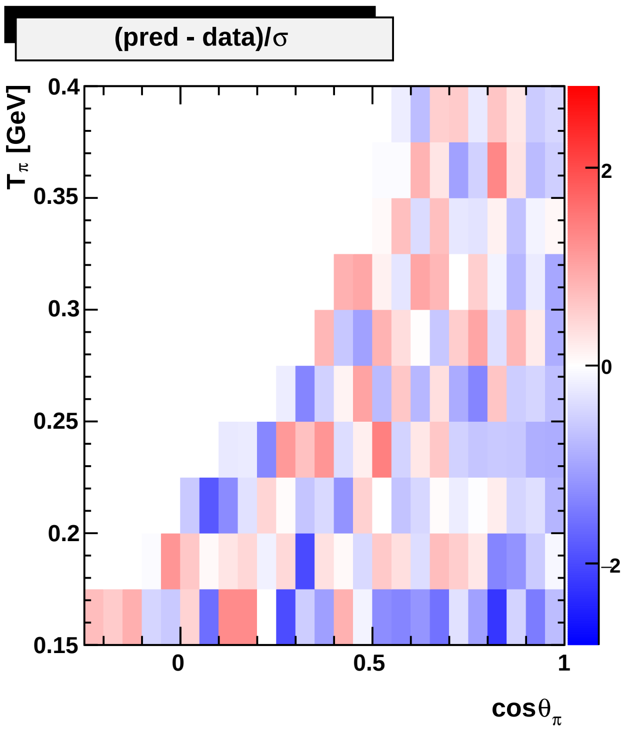
trunk:G00_00a:miniboone_fhc

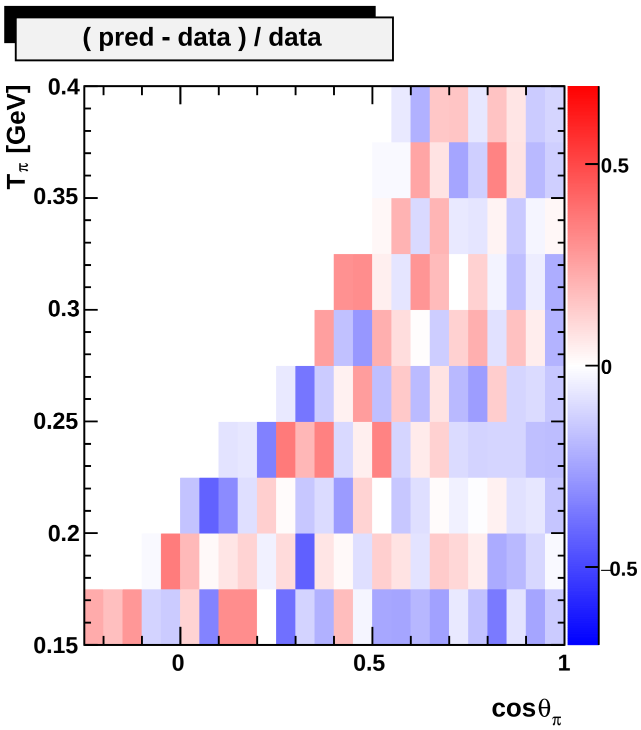
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$

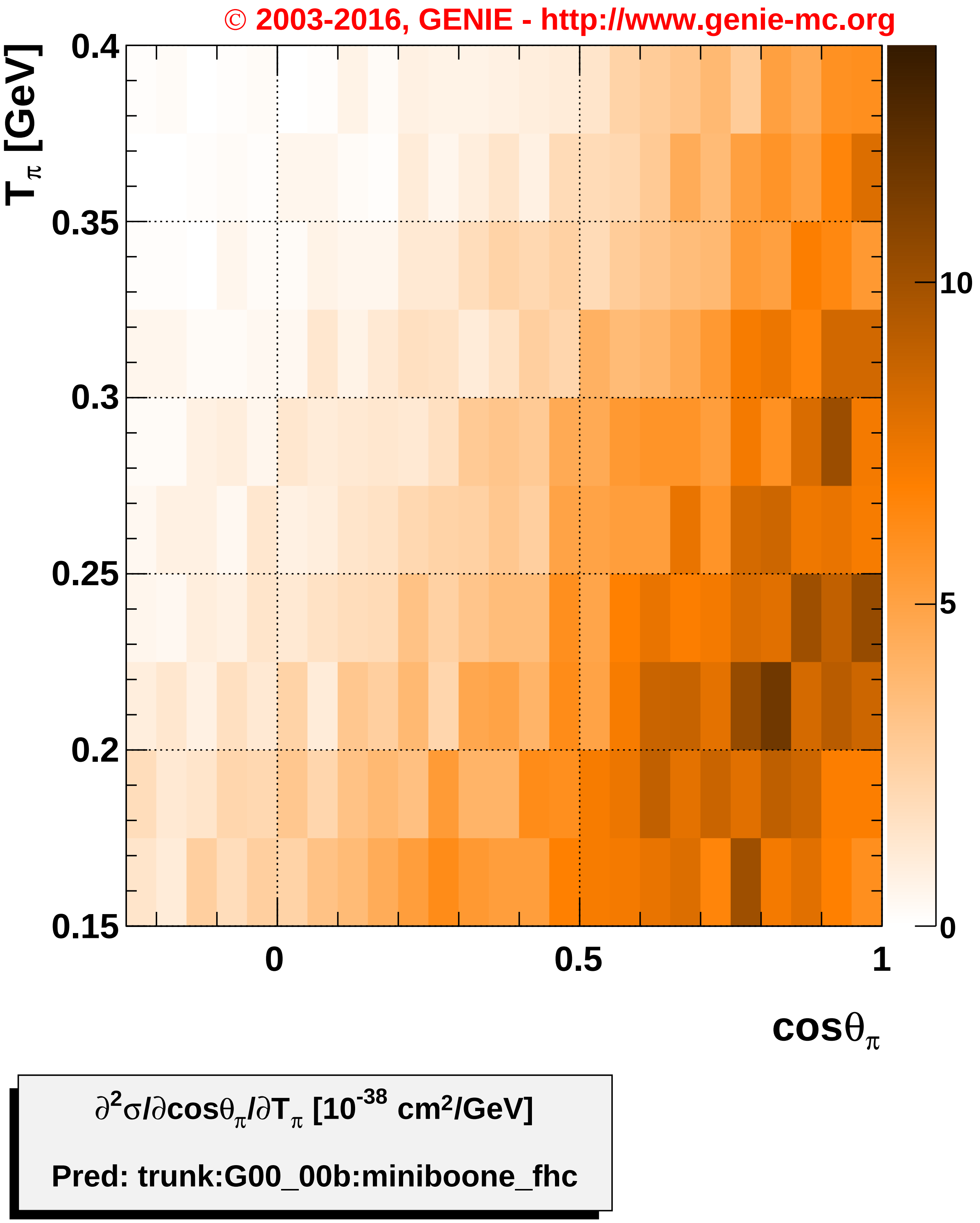
[10^{-38} cm^2/GeV]

χ^2 = 92.3641/154 DoF





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T_π [GeV]
0.4
0.35
0.3
0.25
0.2
0.15
0
0.5
1
$\cos\theta_\pi$
10
5
0
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
Pred: trunk:G00_00b:miniboone_fhc

miniboone_nucc1pip_2011

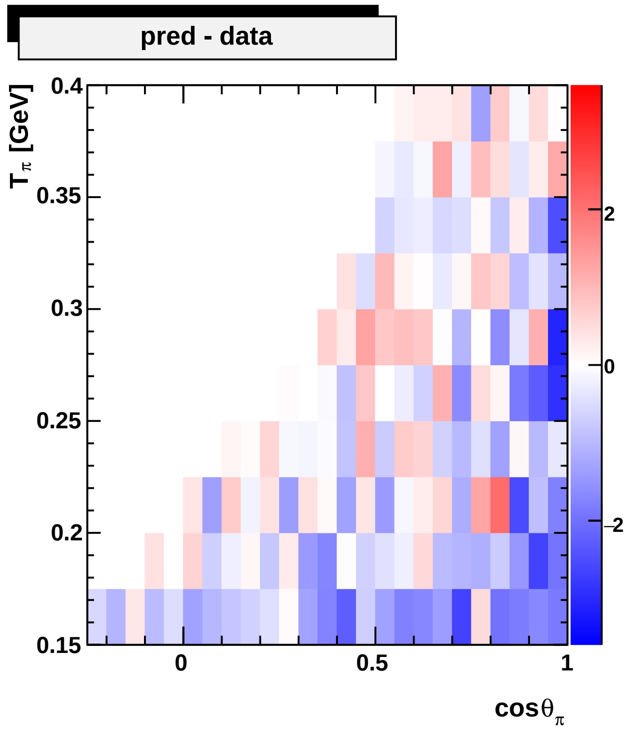
VS

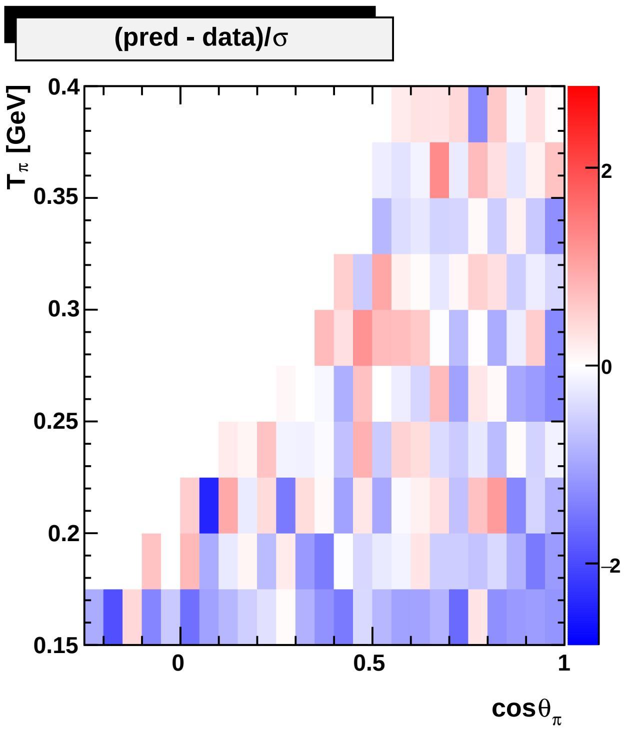
trunk:G00_00b:miniboone_fhc

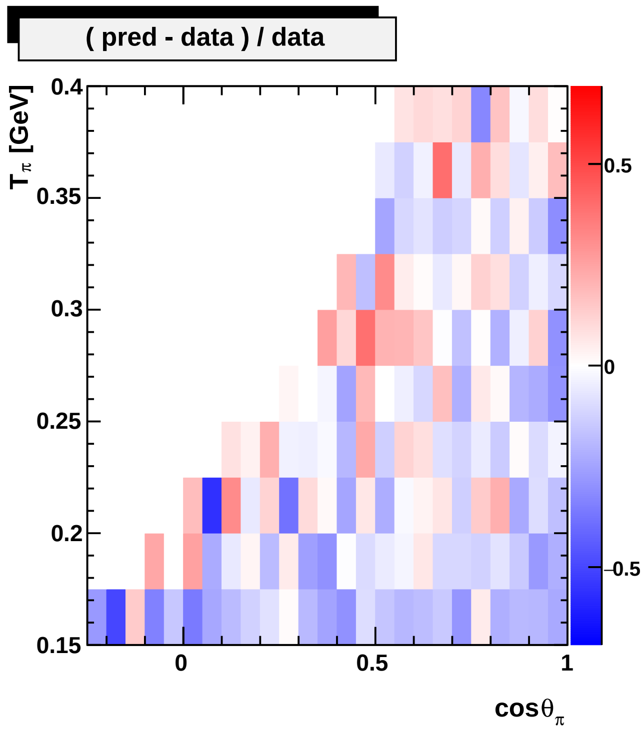
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$

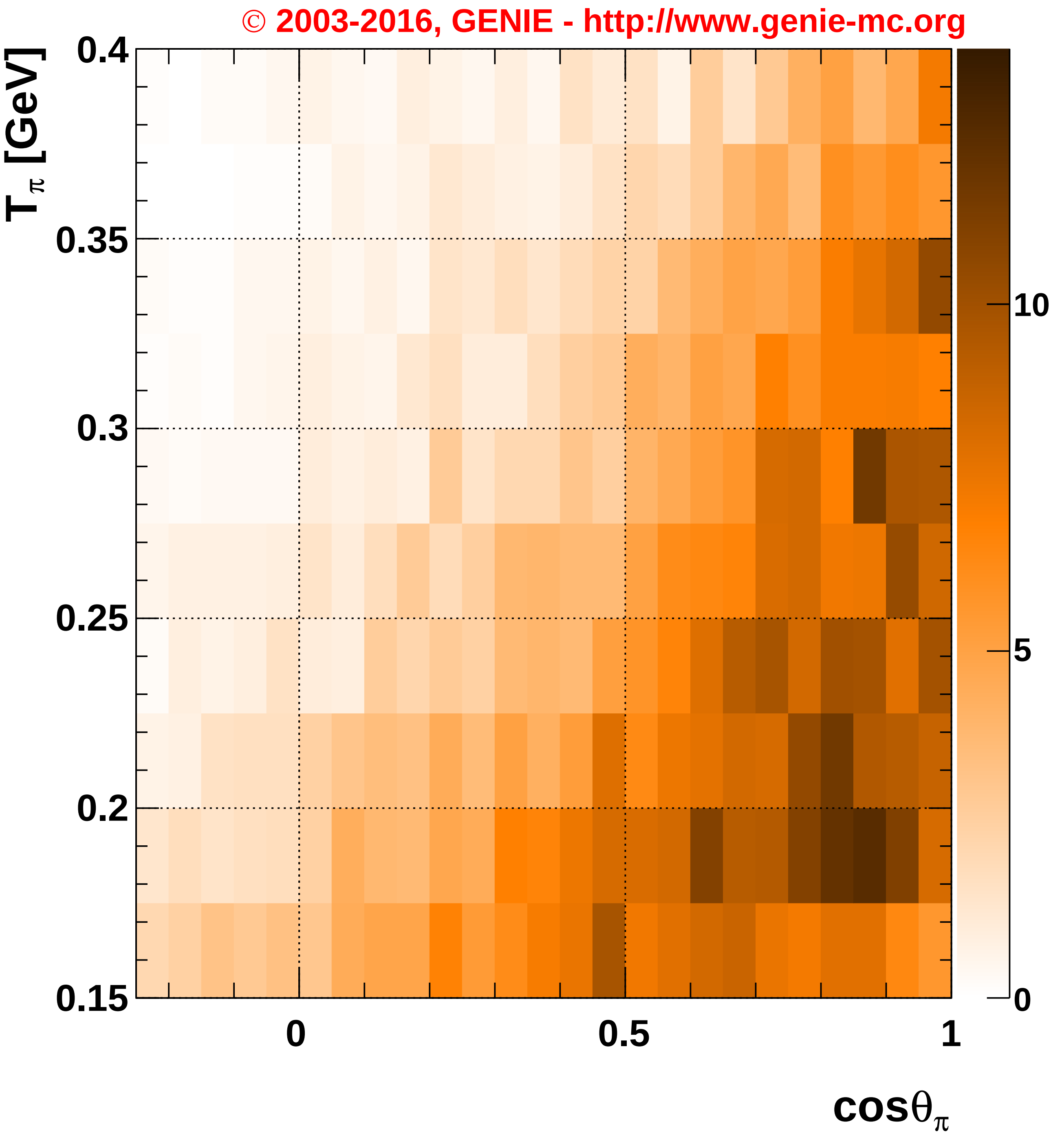
$[10^{-38}\ \mathrm{cm}^2/\mathrm{GeV}]$

χ^2 = 85.8407/154 DoF









$\partial^2\sigma/\partial\cos\theta_{\pi}/\partial T_{\pi}$ [10^{-38} cm^2/GeV]

Pred: trunk:G16_01a:miniboone_fhc

miniboone_nucc1pip_2011

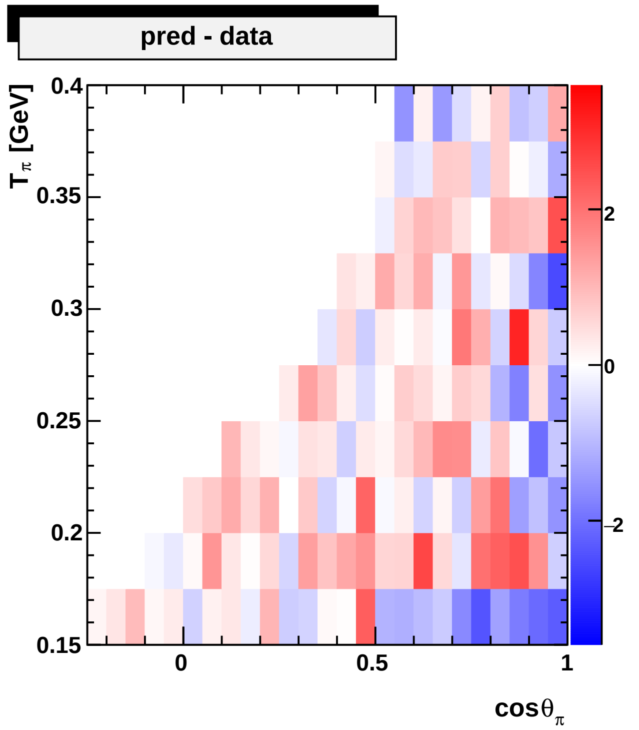
VS

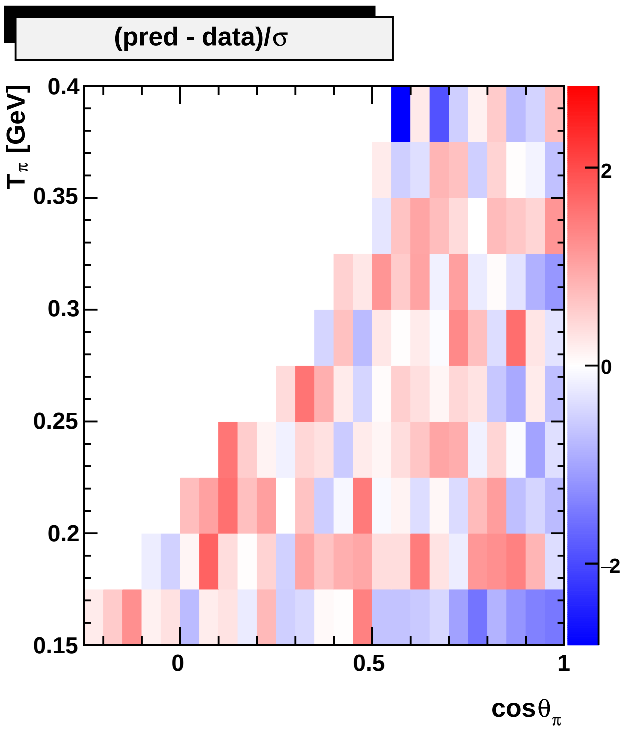
trunk:G16_01a:miniboone_fhc

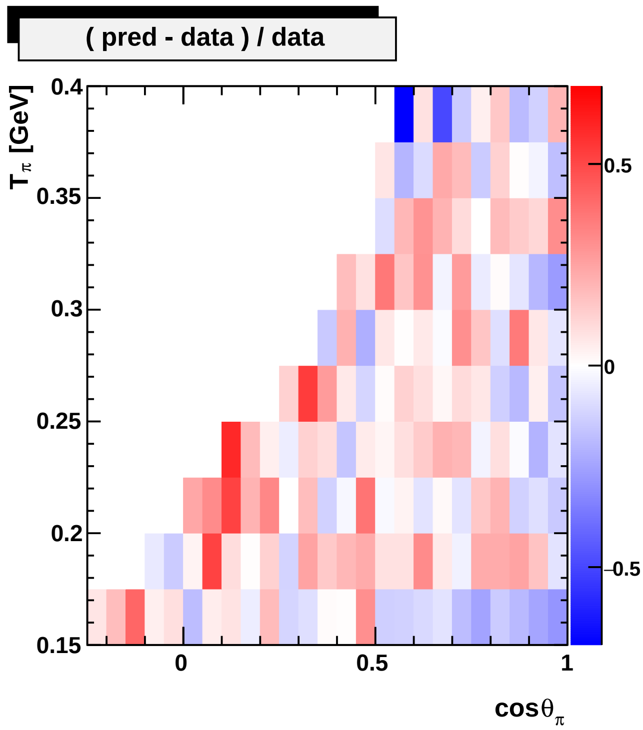
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$

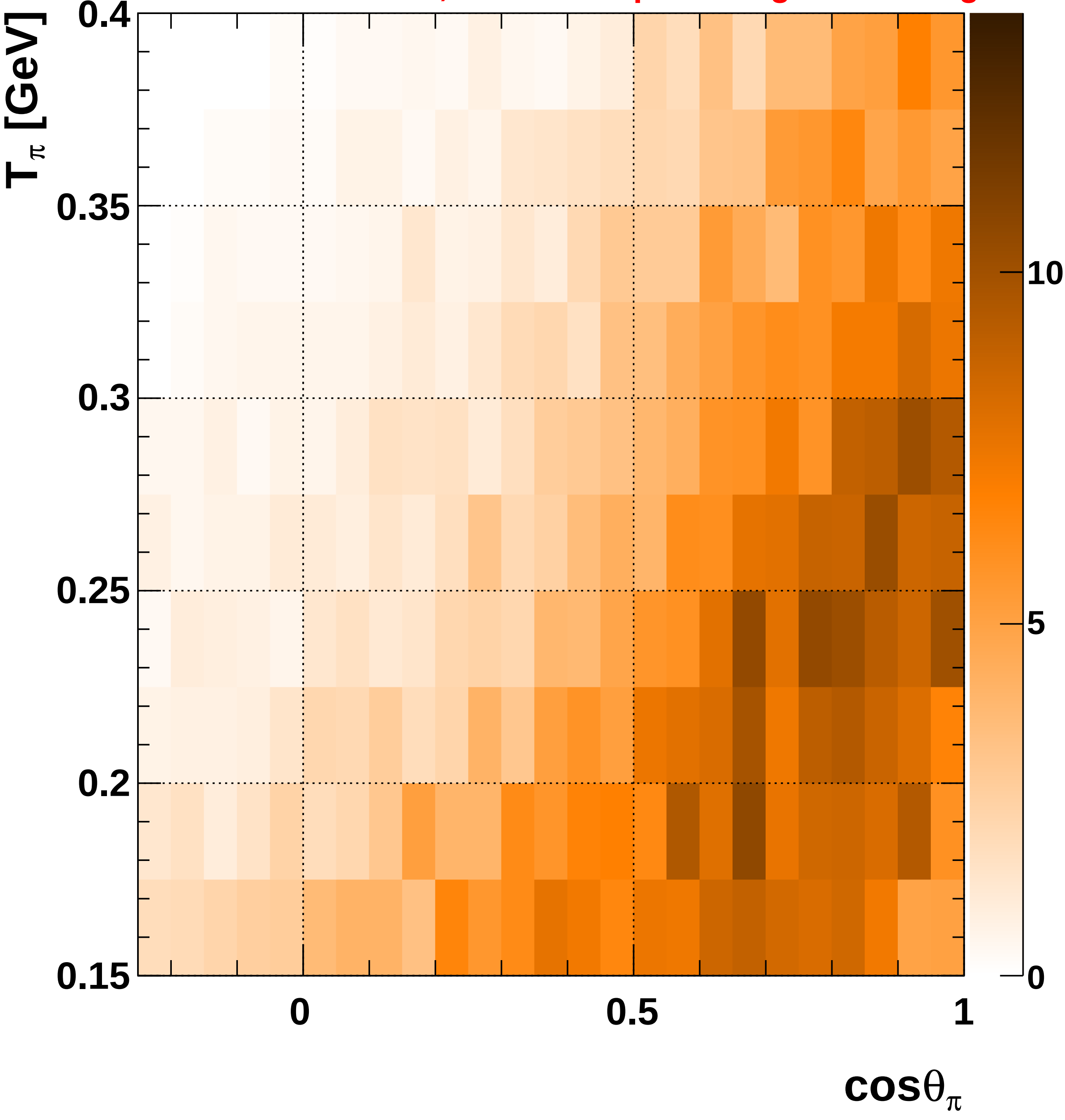
$[10^{-38}\ \mathrm{cm}^2/\mathrm{GeV}]$

χ^2 = 91.6709/154 DoF









$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ $[10^{-38}$ $cm^2/GeV]$

Pred: trunk:G16_02b:miniboone_fhc

miniboone_nucc1pip_2011

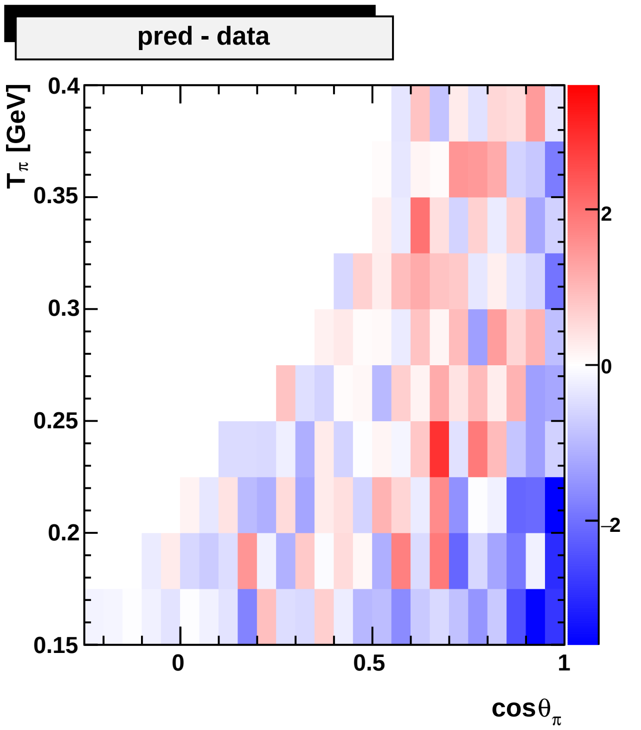
VS

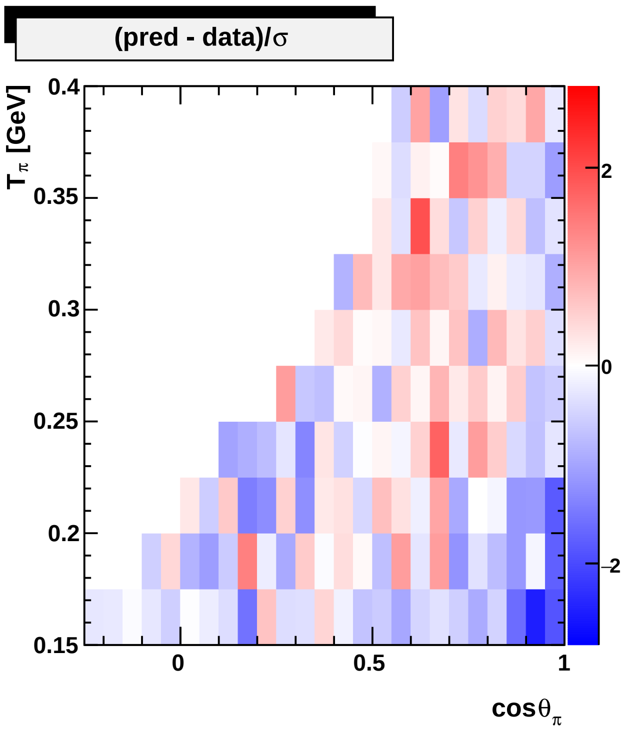
trunk:G16_02b:miniboone_fhc

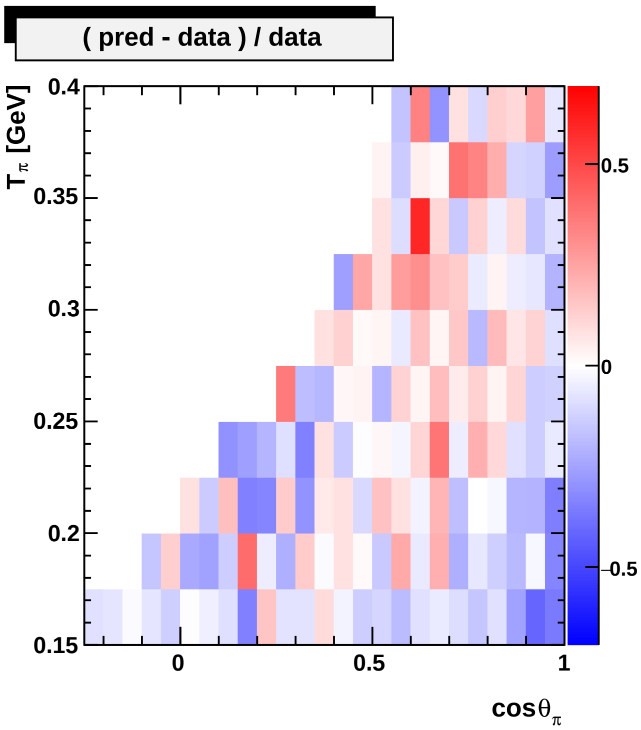
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$

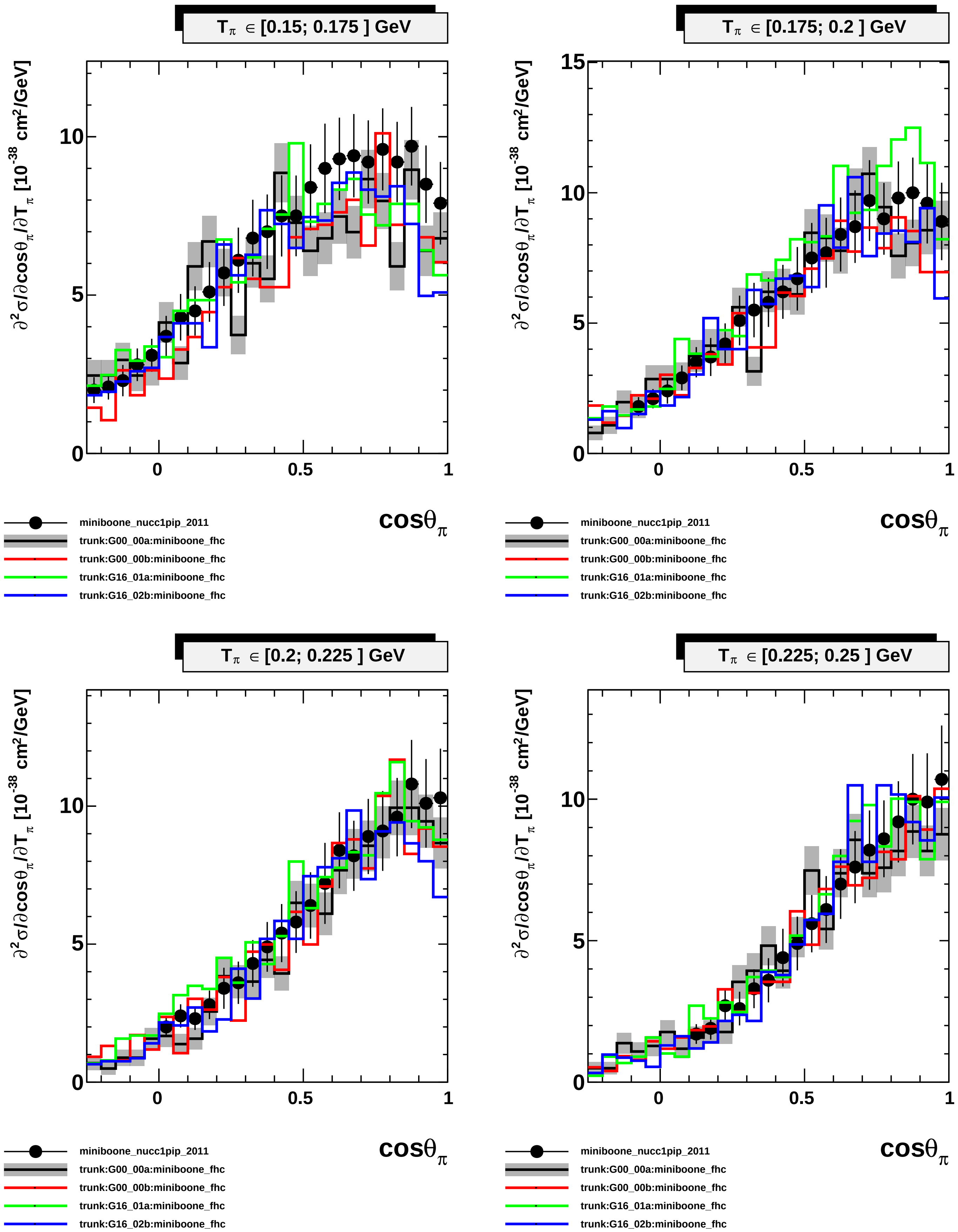
$[10^{-38}\ \mathrm{cm}^2/\mathrm{GeV}]$

χ^2 = 89.861/154 DoF

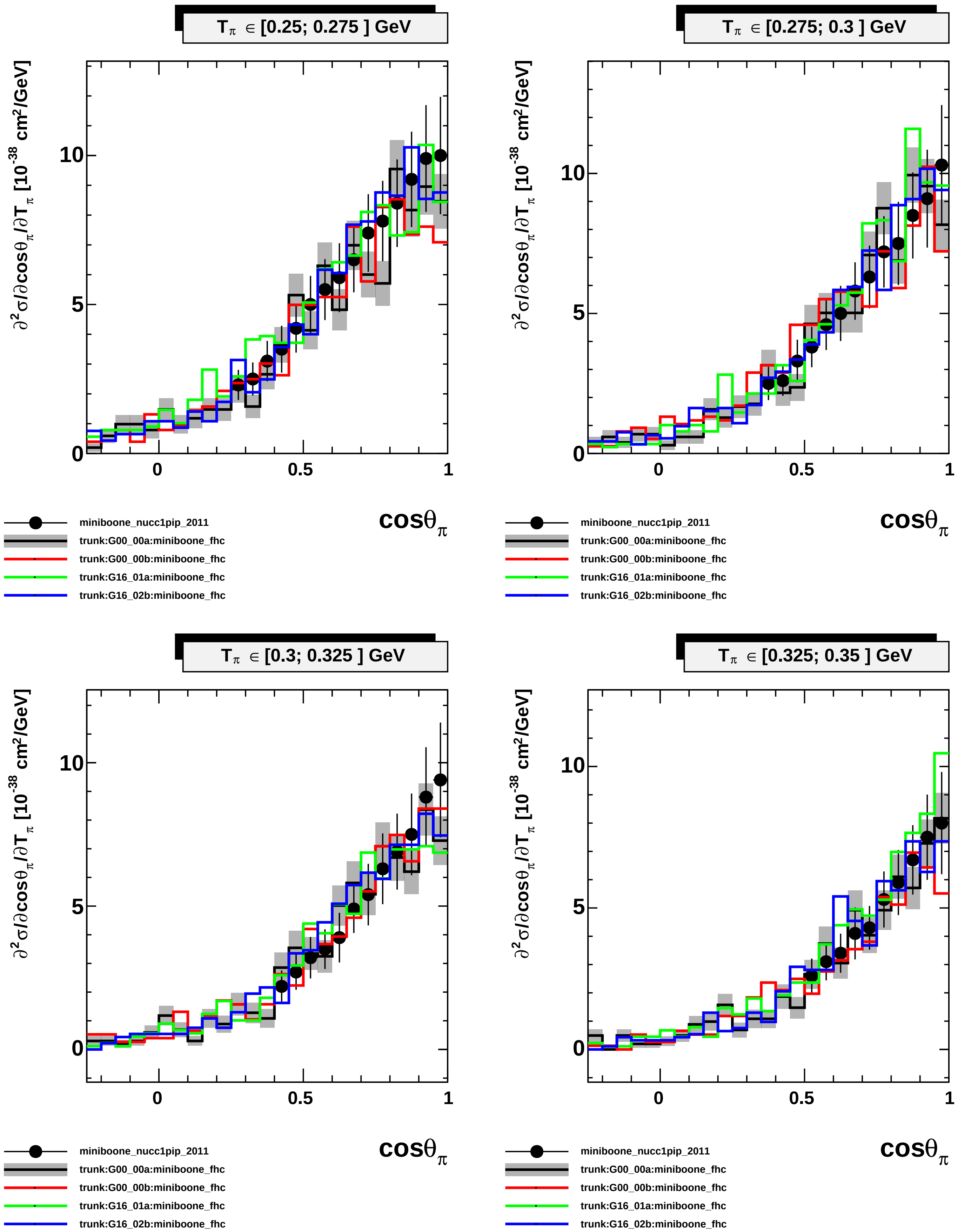




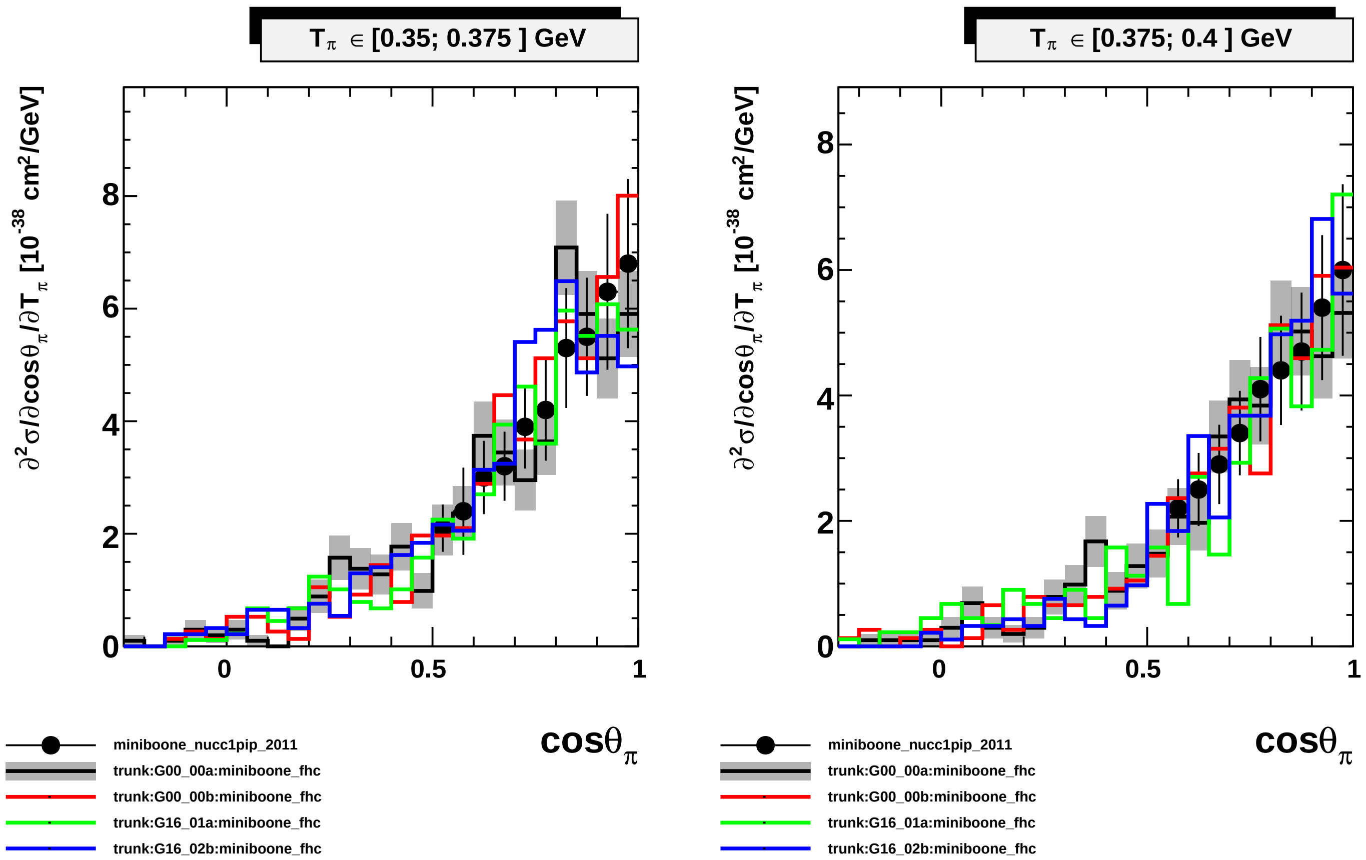




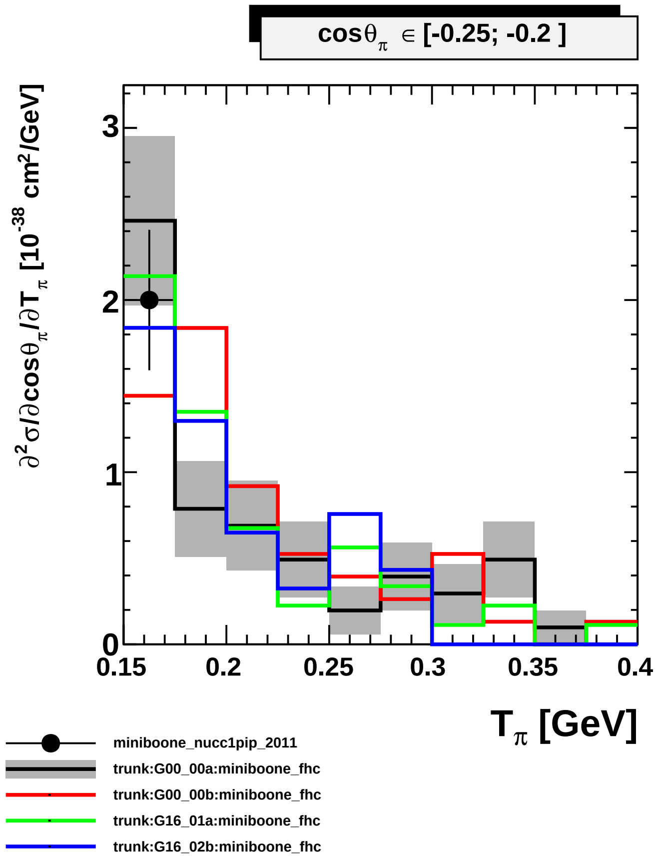
Tπ ∈ [0.15; 0.175] GeV
Tπ ∈ [0.175; 0.2] GeV
Tπ ∈ [0.2; 0.225] GeV
Tπ ∈ [0.225; 0.25] GeV
∂²σ/∂cosθπ/∂Tπ [10⁻³⁸ cm²/GeV]
cosθπ
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

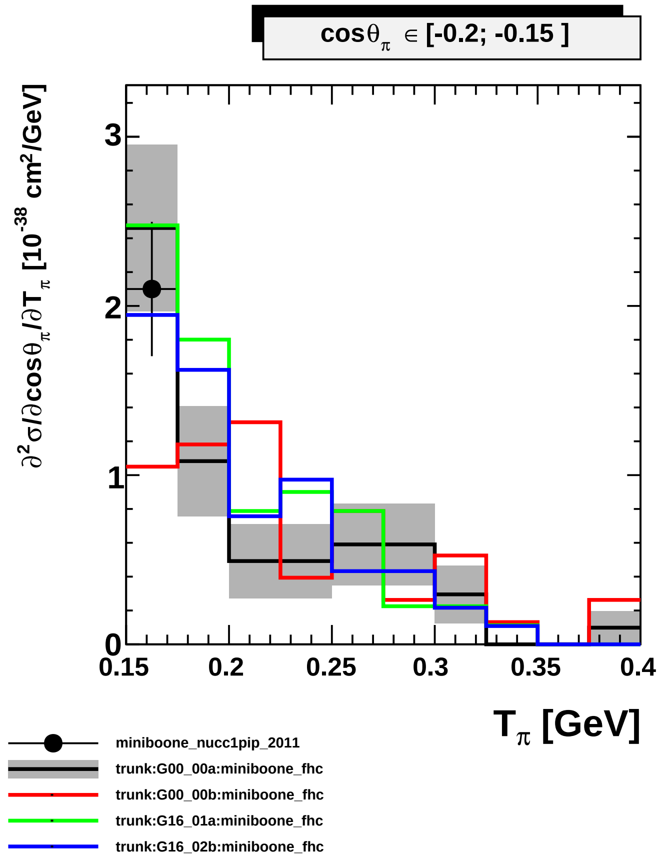


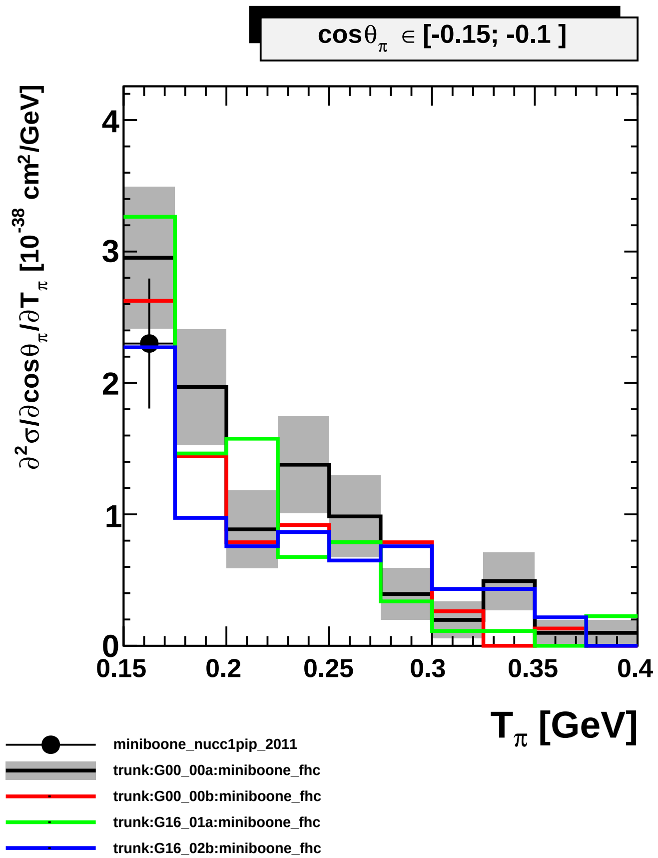
Tπ ∈ [0.25; 0.275] GeV
Tπ ∈ [0.275; 0.3] GeV
Tπ ∈ [0.3; 0.325] GeV
Tπ ∈ [0.325; 0.35] GeV
∂²σ/∂cosθπ/∂Tπ [10⁻³⁸ cm²/GeV]
cosθπ
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

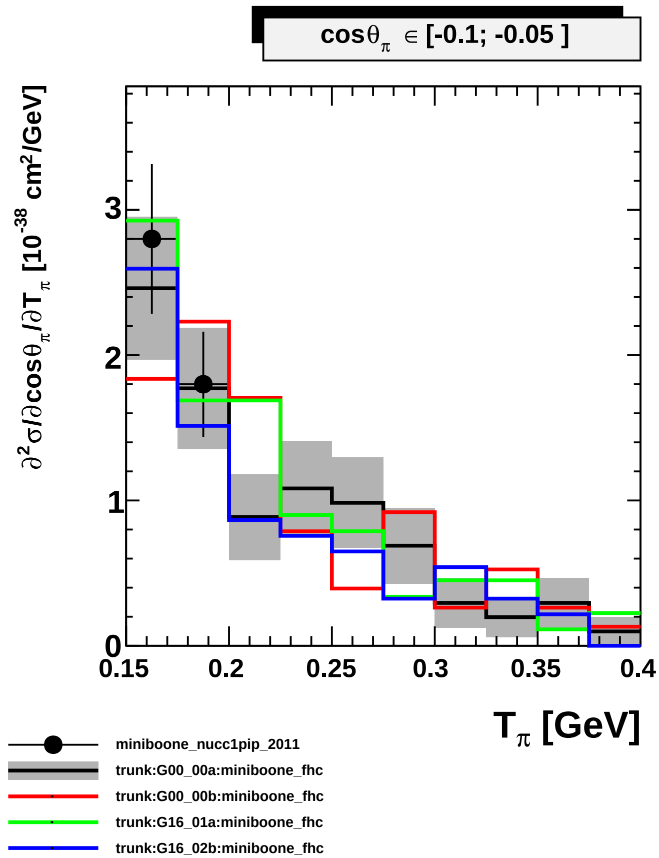


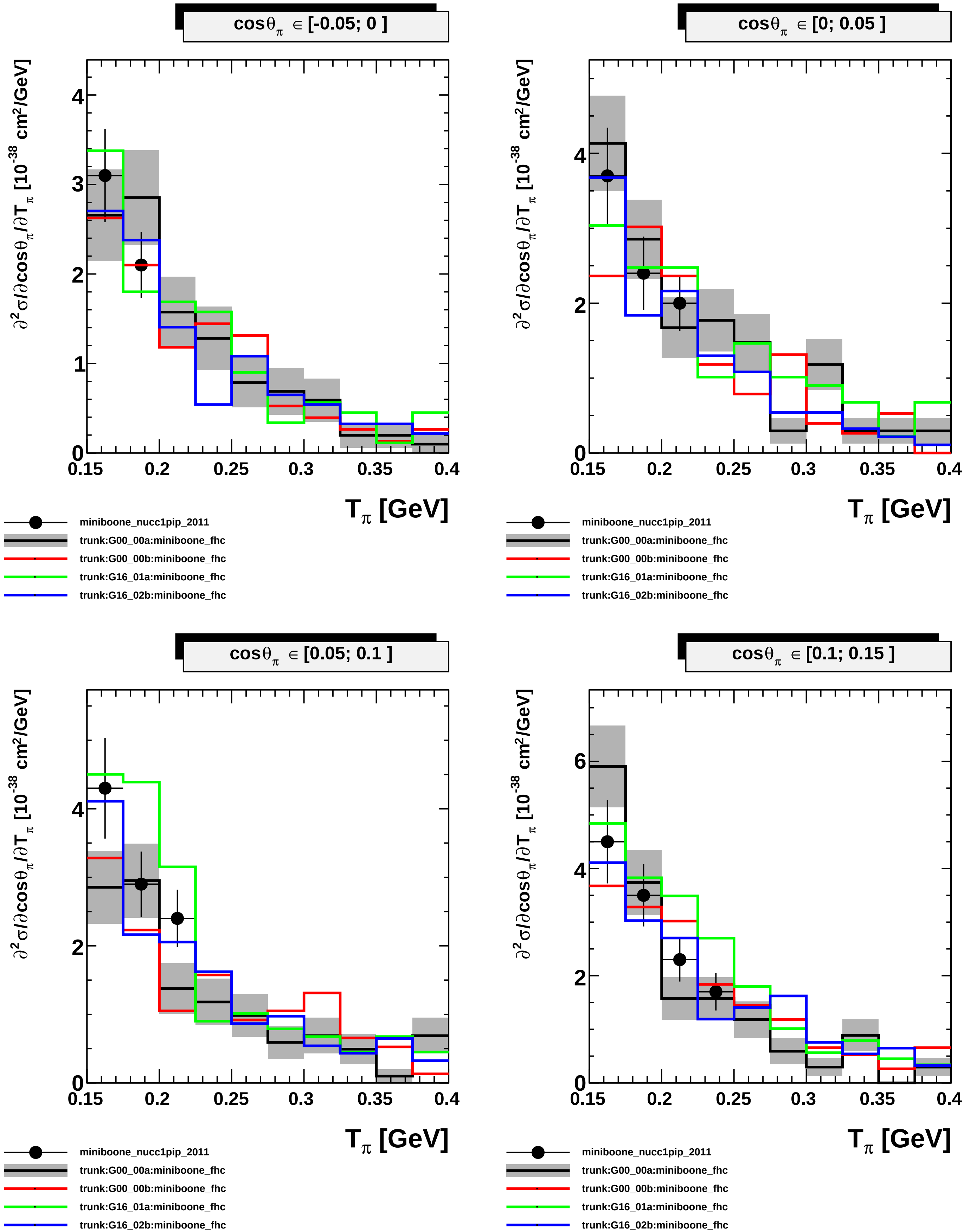
$T_\pi \in [0.35; 0.375]$ GeV
$T_\pi \in [0.375; 0.4]$ GeV
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
$\cos\theta_\pi$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


cosθ_π ∈ [-0.25; -0.2]
∂²σ/∂cosθ_π/∂T_π [10⁻³⁸ cm²/GeV]
0
1
2
3
0.15
0.2
0.25
0.3
0.35
0.4
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

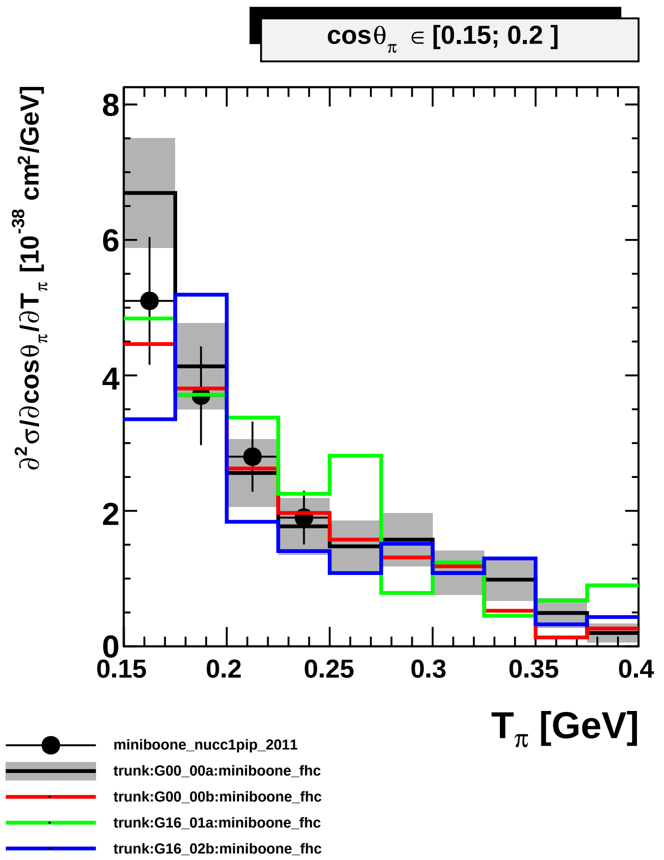

cosθ_π ∈ [-0.2; -0.15]
∂²σ/∂cosθ_π/∂T_π [10⁻³⁸ cm²/GeV]
0
1
2
3
0.15
0.2
0.25
0.3
0.35
0.4
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


cosθ_π ∈ [-0.15; -0.1]
∂²σ/∂cosθ_π/∂T_π [10⁻³⁸ cm²/GeV]
0
1
2
3
4
0.15
0.2
0.25
0.3
0.35
0.4
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

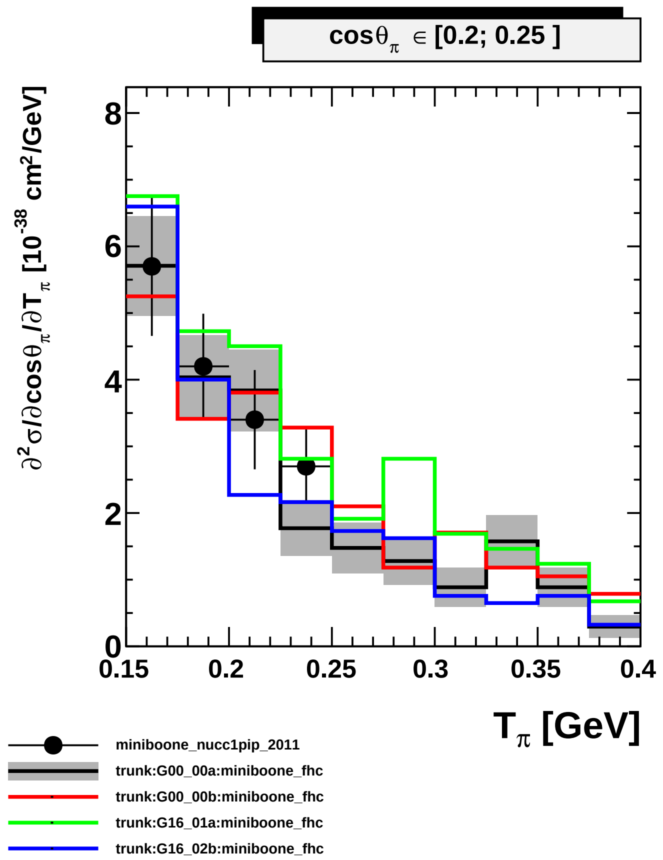

cosθ_π ∈ [-0.1; -0.05]
∂²σ/∂cosθ_π/∂T_π [10⁻³⁸ cm²/GeV]
0
1
2
3
0.15
0.2
0.25
0.3
0.35
0.4
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



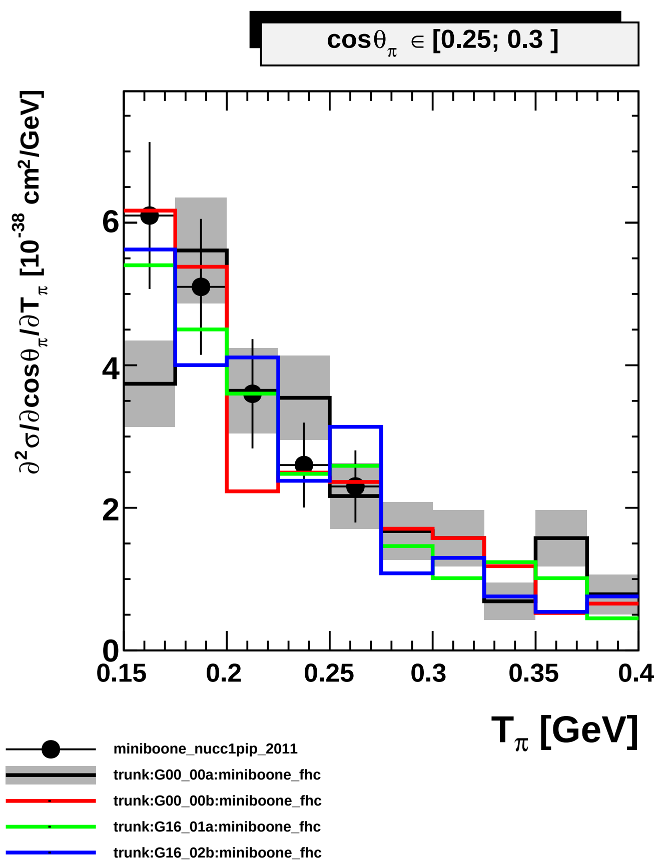
$\cos\theta_\pi \in [-0.05; 0\ ]$
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
0
1
2
3
4
0.15
0.2
0.25
0.3
0.35
0.4
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc
$\cos\theta_\pi \in [0; 0.05\ ]$
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
0
2
4
0.15
0.2
0.25
0.3
0.35
0.4
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc
$\cos\theta_\pi \in [0.05; 0.1\ ]$
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
0
2
4
0.15
0.2
0.25
0.3
0.35
0.4
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc
$\cos\theta_\pi \in [0.1; 0.15\ ]$
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
0
2
4
6
0.15
0.2
0.25
0.3
0.35
0.4
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



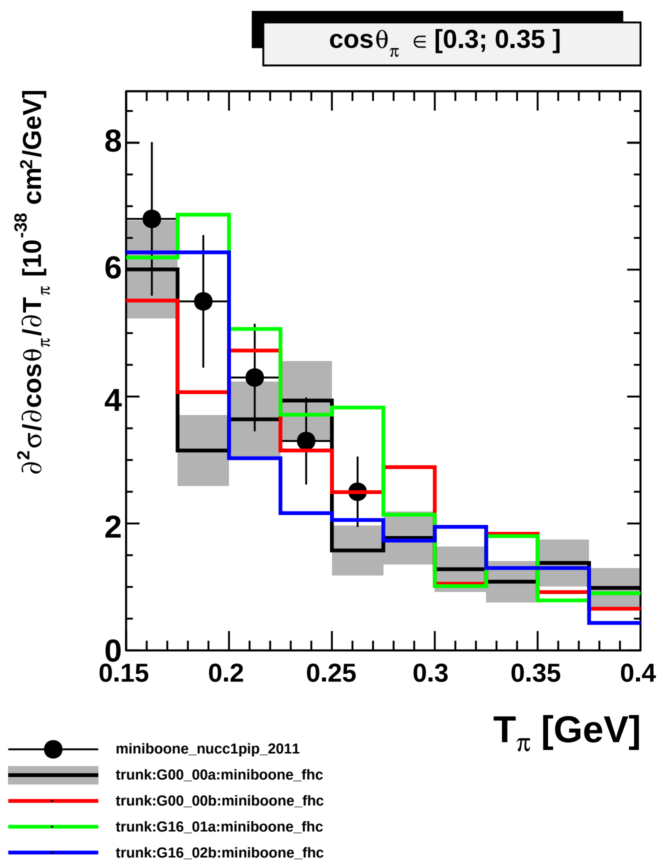
cosθ_π ∈ [0.15; 0.2]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



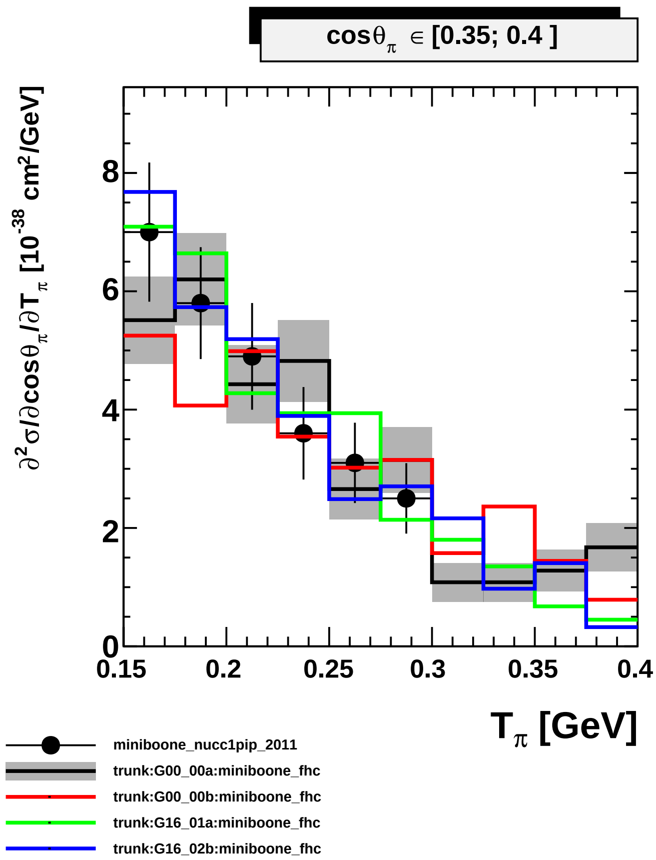
cosθ_π ∈ [0.2; 0.25]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

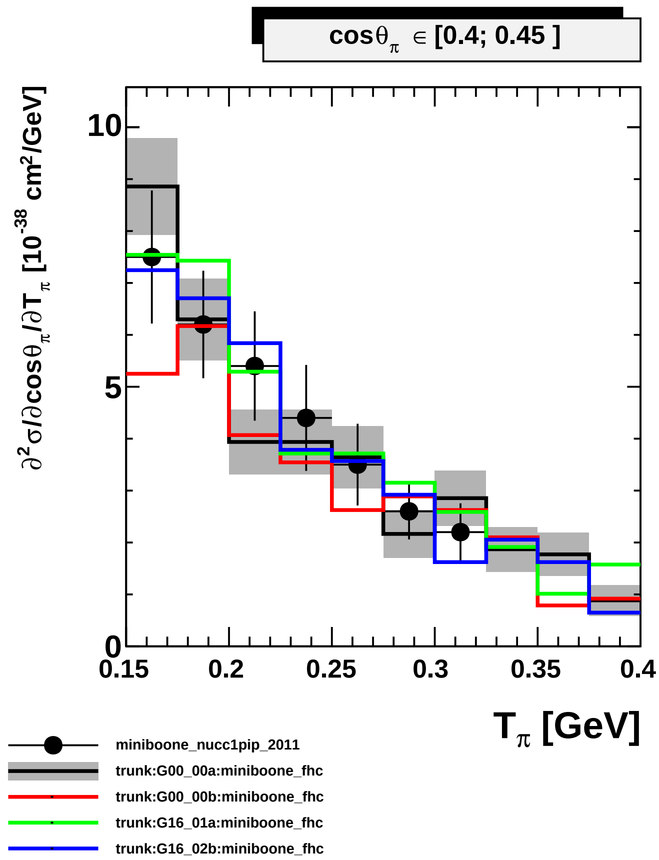


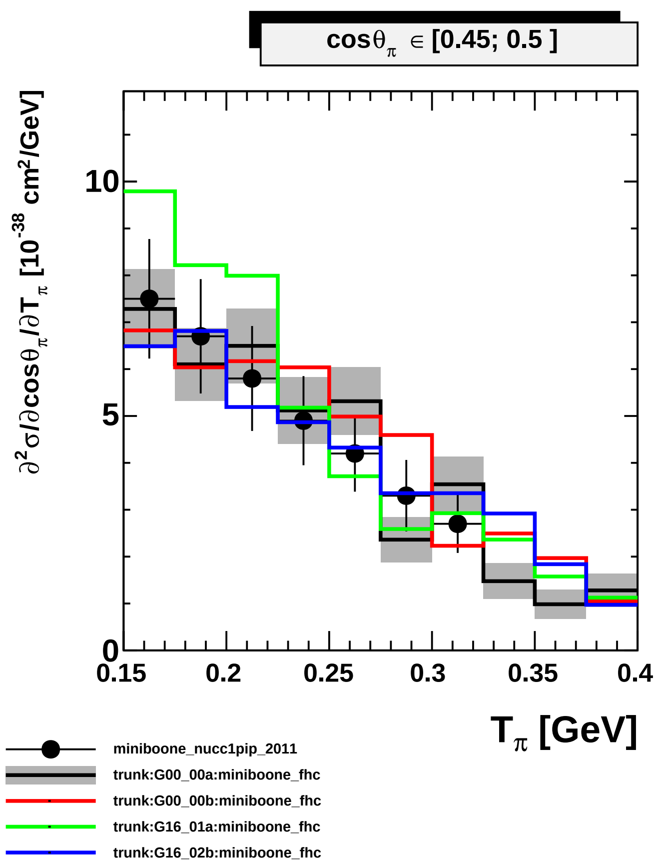
cosθ_π ∈ [0.25; 0.3]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

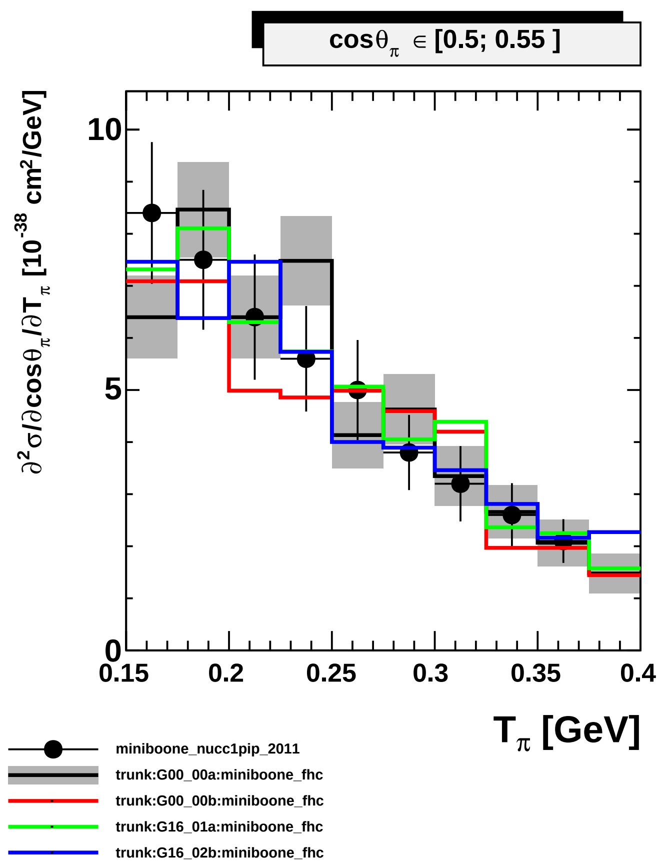


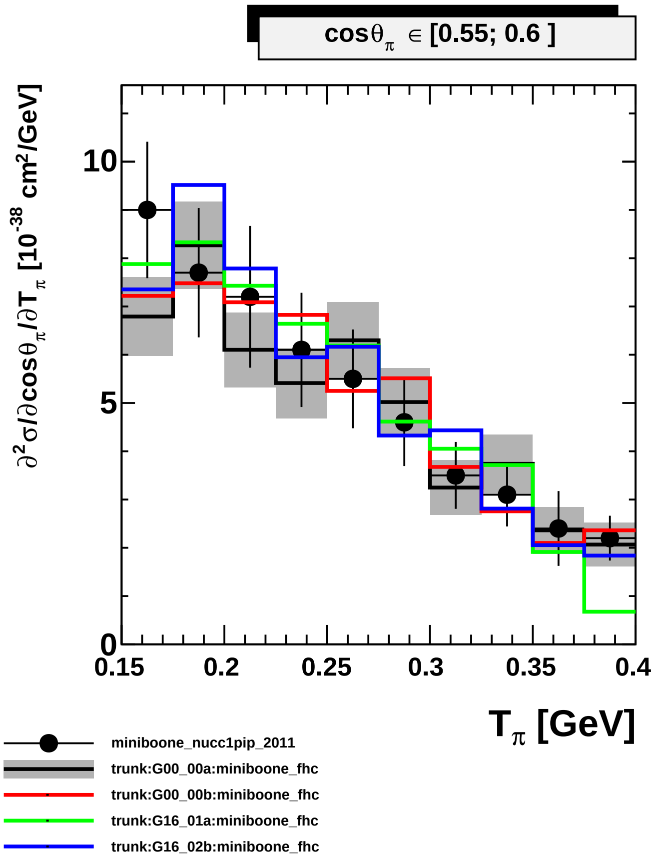
cosθ_π ∈ [0.3; 0.35]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

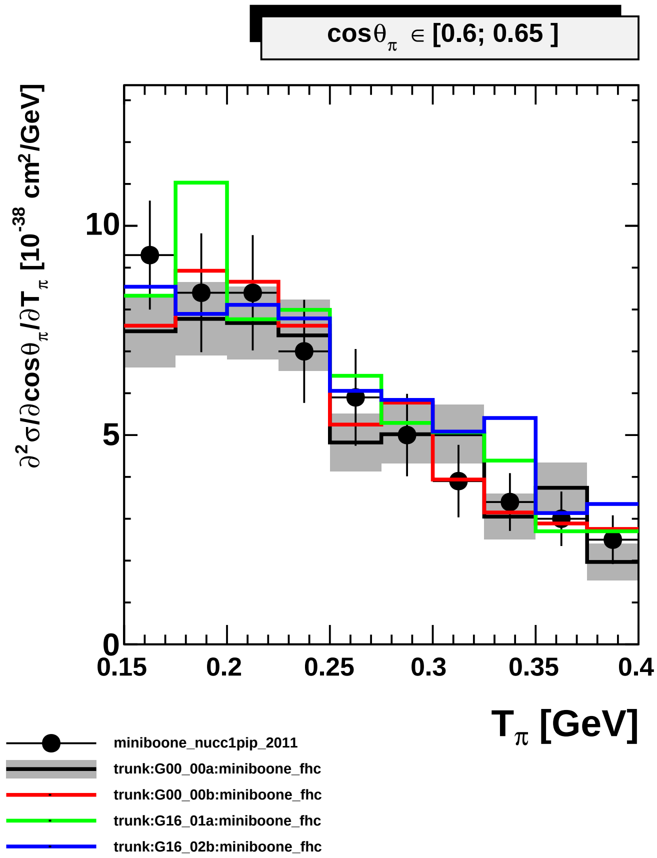

$\cos\theta_\pi \in [0.35; 0.4]$
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

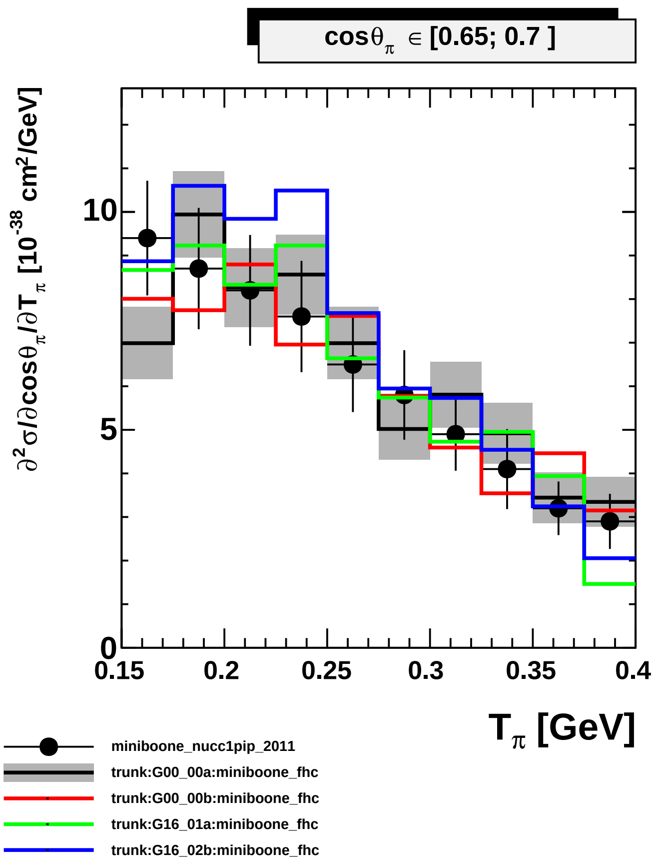

$\cos\theta_\pi \in [0.4; 0.45]$
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

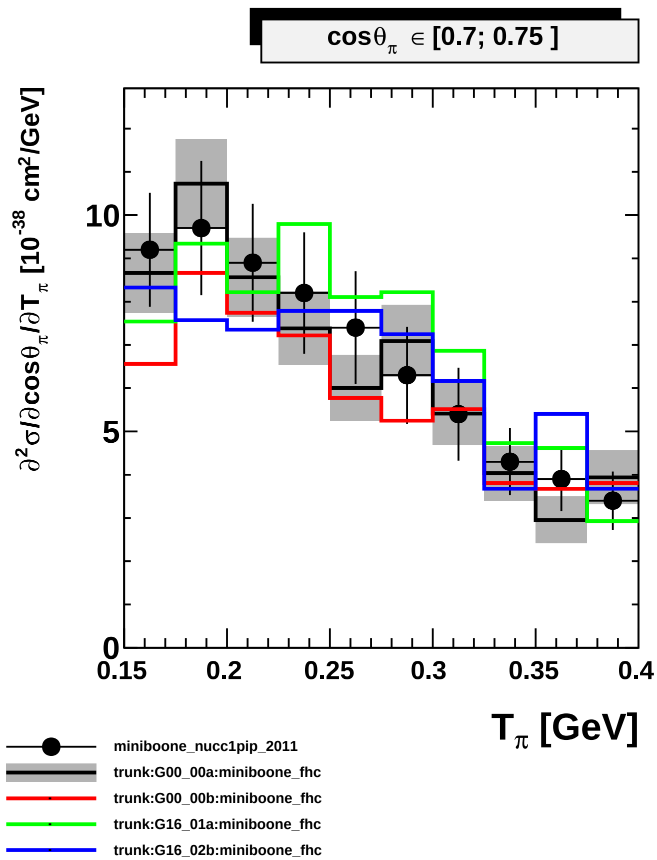

$\cos\theta_\pi \in [0.45; 0.5]$
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

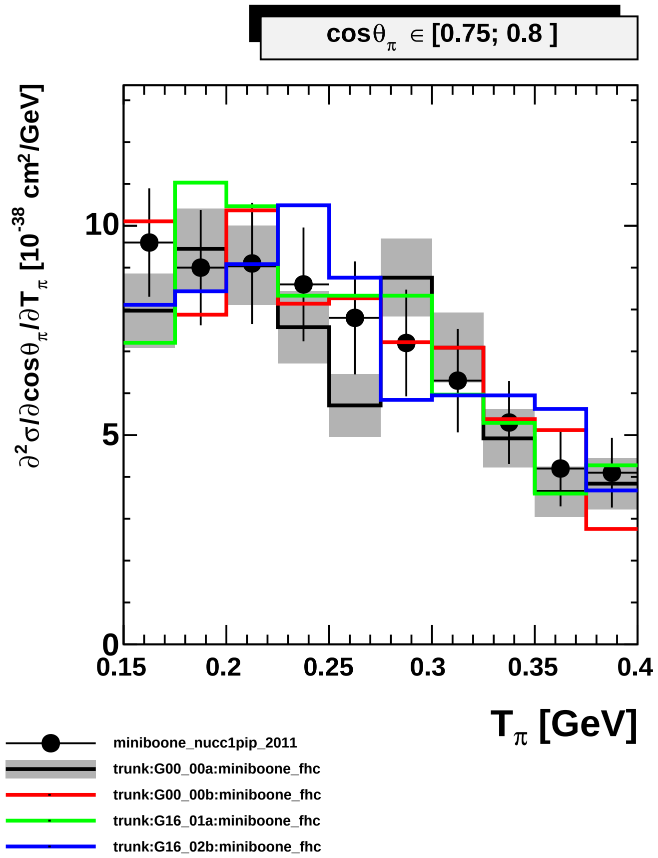

$\cos\theta_\pi \in [0.5; 0.55]$
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


cosθ_π ∈ [0.55; 0.6]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

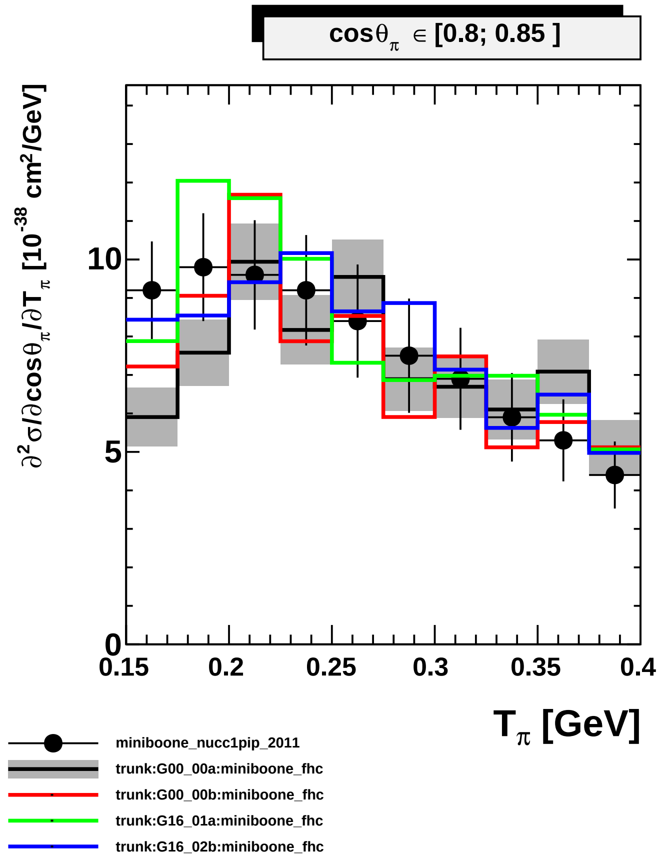

cosθ_π ∈ [0.6; 0.65]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


cosθ_π ∈ [0.65; 0.7]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

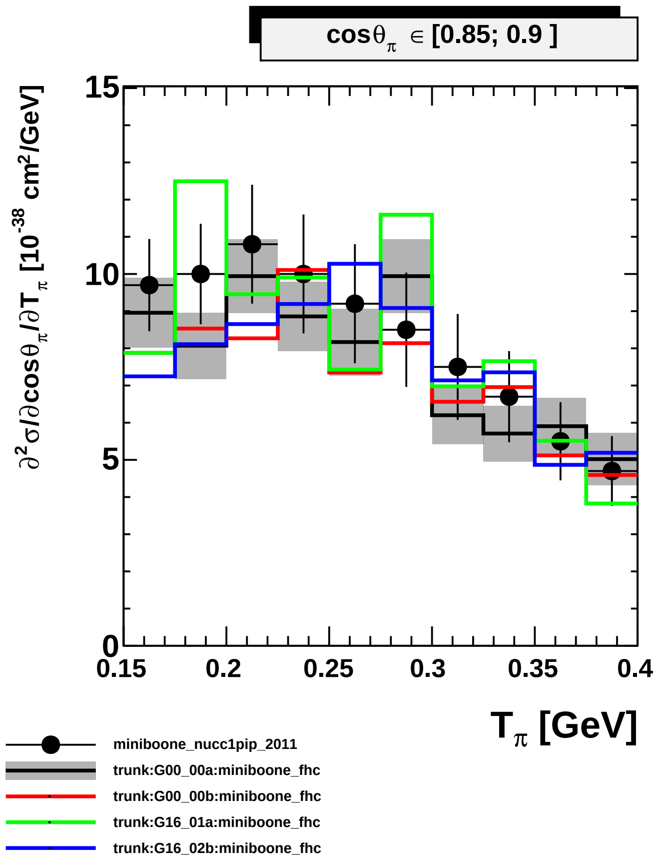

cosθ_π ∈ [0.7; 0.75]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



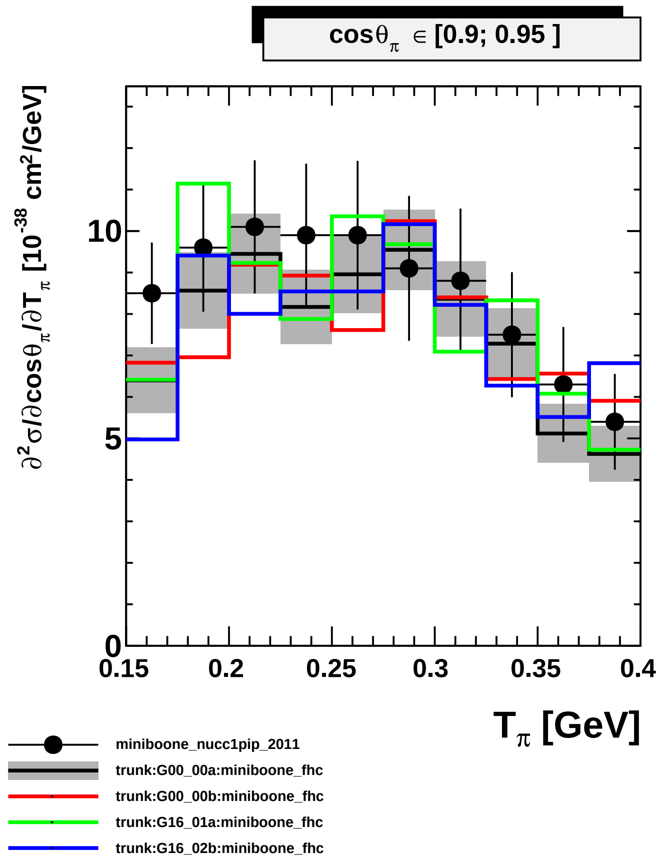
cosθ_π ∈ [0.75; 0.8]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
0
5
10
0.15
0.2
0.25
0.3
0.35
0.4
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



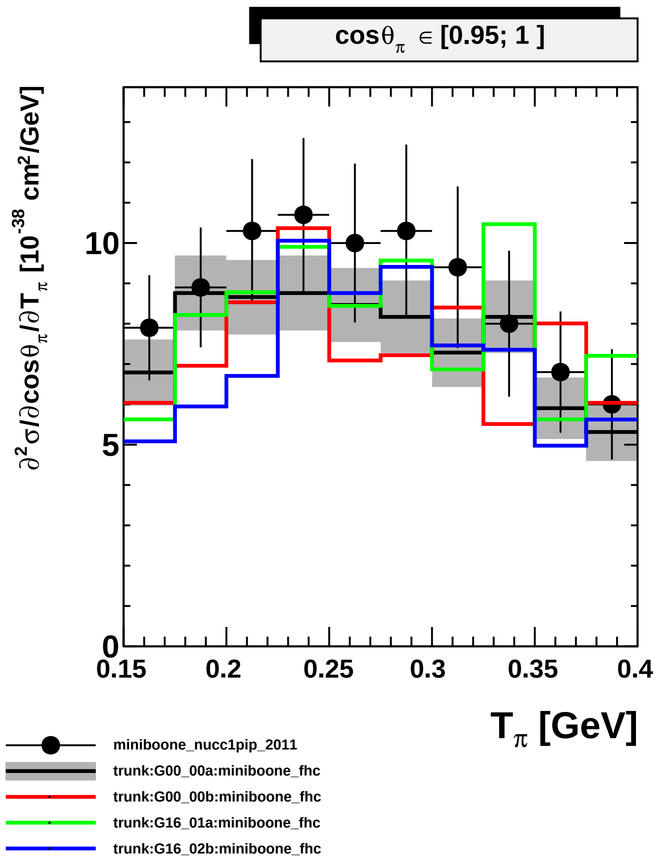
cosθ_π ∈ [0.8; 0.85]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
0
5
10
0.15
0.2
0.25
0.3
0.35
0.4
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



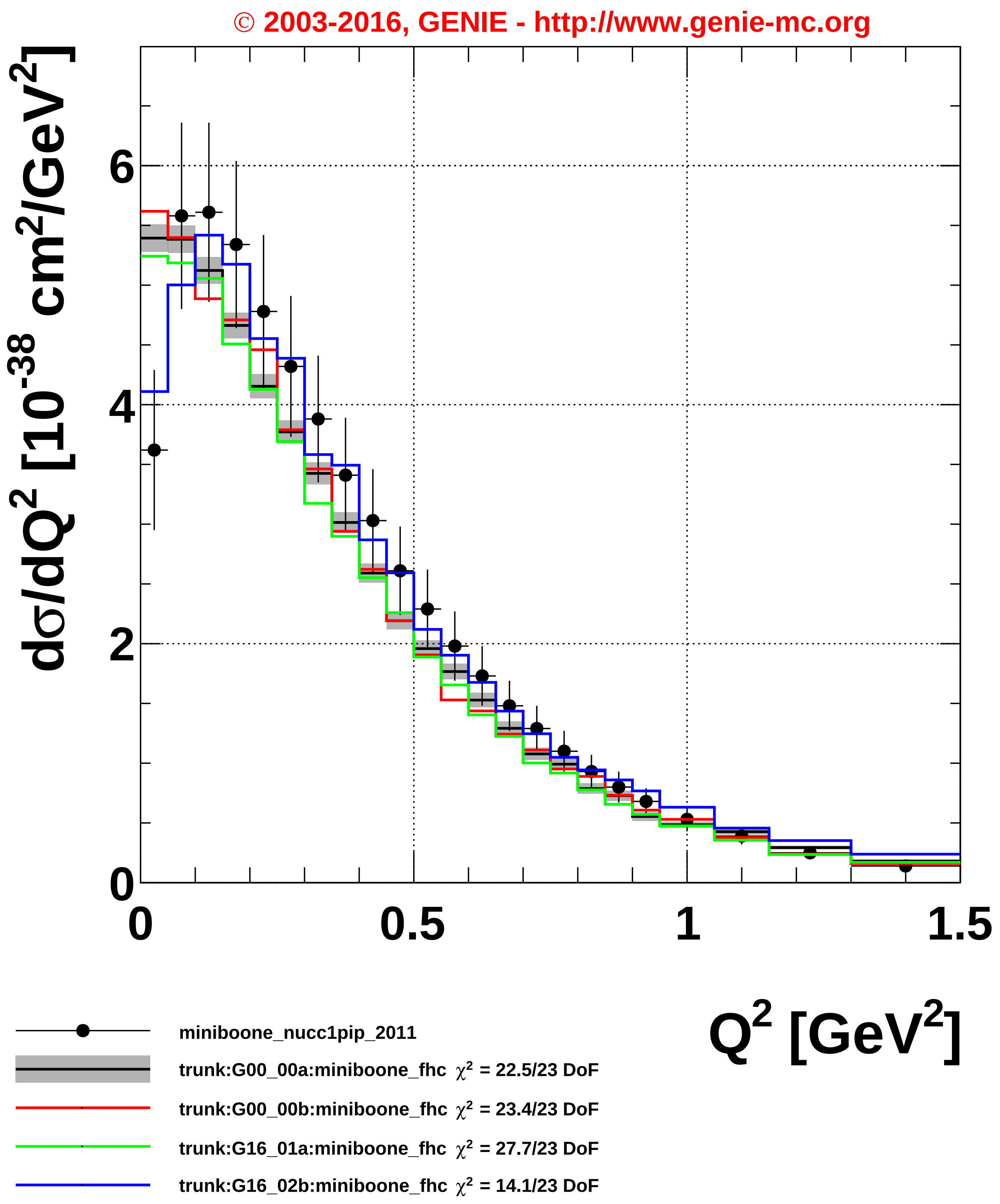
cosθ_π ∈ [0.85; 0.9]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
0
5
10
15
0.15
0.2
0.25
0.3
0.35
0.4
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



cosθ_π ∈ [0.9; 0.95]
∂²σ/∂cosθ_π/∂T_π [10^-38 cm²/GeV]
0
5
10
0.15
0.2
0.25
0.3
0.35
0.4
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



cosθ$_\pi$ ∈ [0.95; 1]
$\partial^2\sigma/\partial\cos\theta_\pi/\partial T_\pi$ [10^{-38} cm^2/GeV]
10
5
0
0.15
0.2
0.25
0.3
0.35
0.4
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc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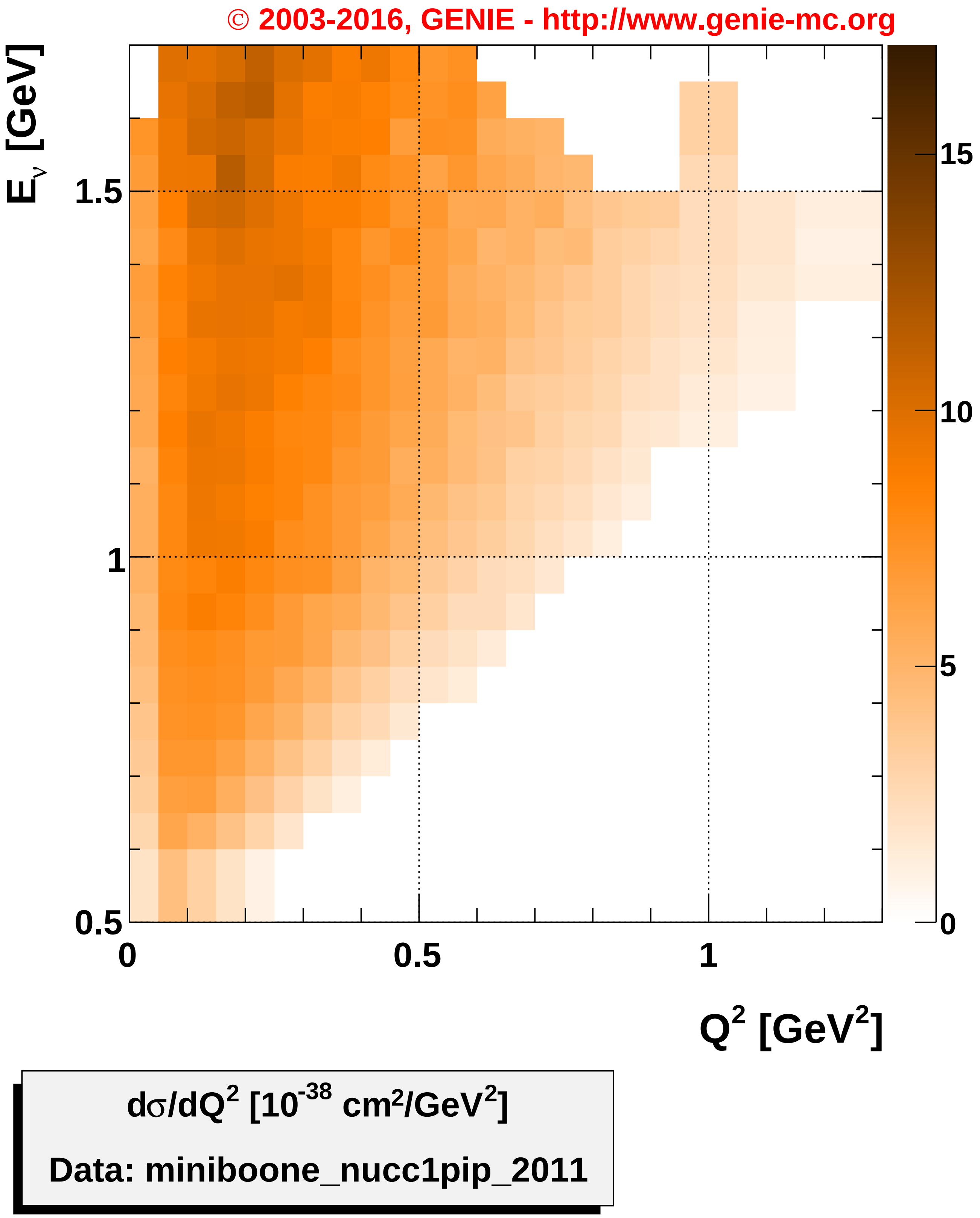
dσ/dQ² [10⁻³⁸ cm²/GeV²]
Q² [GeV²]
0
2
4
6
0
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc χ² = 22.5/23 DoF
trunk:G00_00b:miniboone_fhc χ² = 23.4/23 DoF
trunk:G16_01a:miniboone_fhc χ² = 27.7/23 DoF
trunk:G16_02b:miniboone_fhc χ² = 14.1/23 DoF



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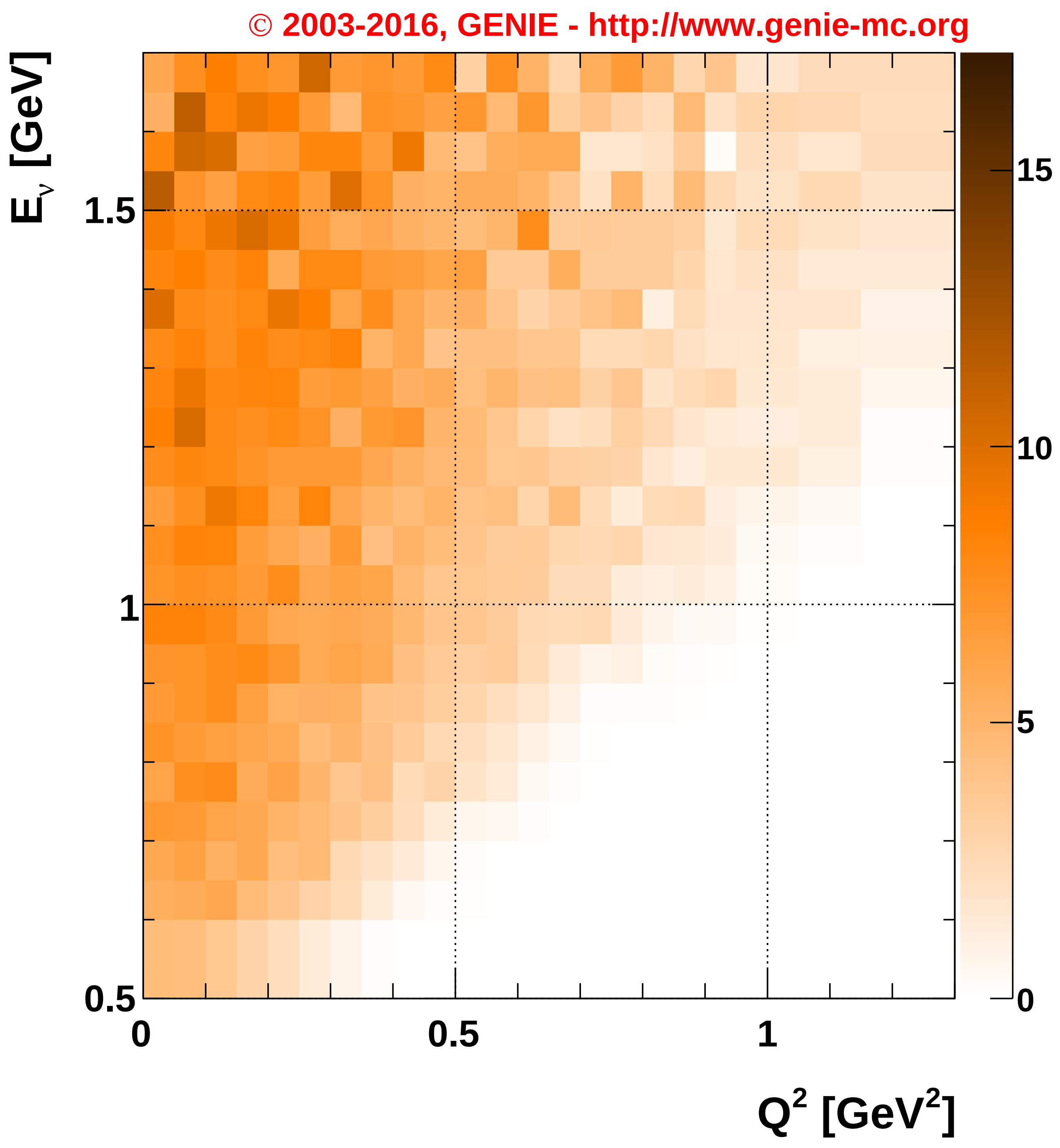
E_ν [GeV]
1.5
1
0.5
0
0.5
1
15
10
5
0
Q^2 [GeV^2]
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
Data: miniboone_nucc1pip_2011



$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]

Pred: trunk:G00_00a:miniboone_fhc

miniboone_nucc1pip_2011

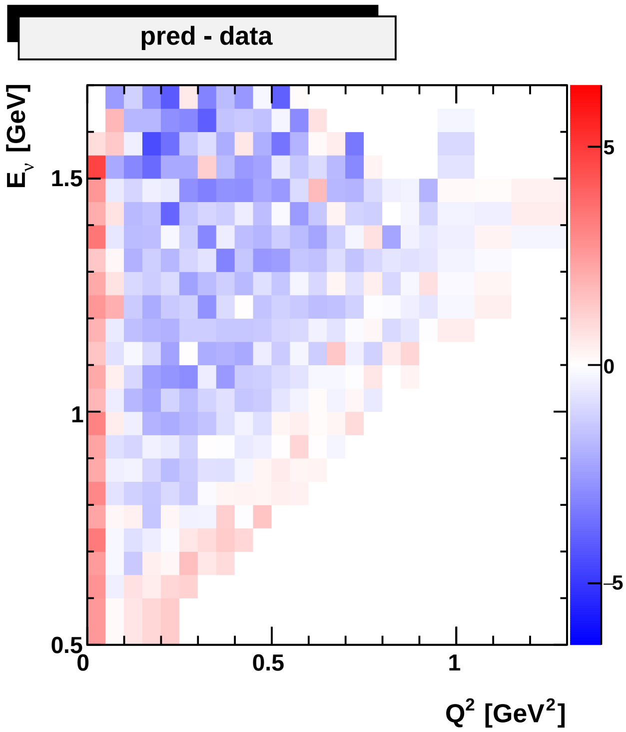
VS

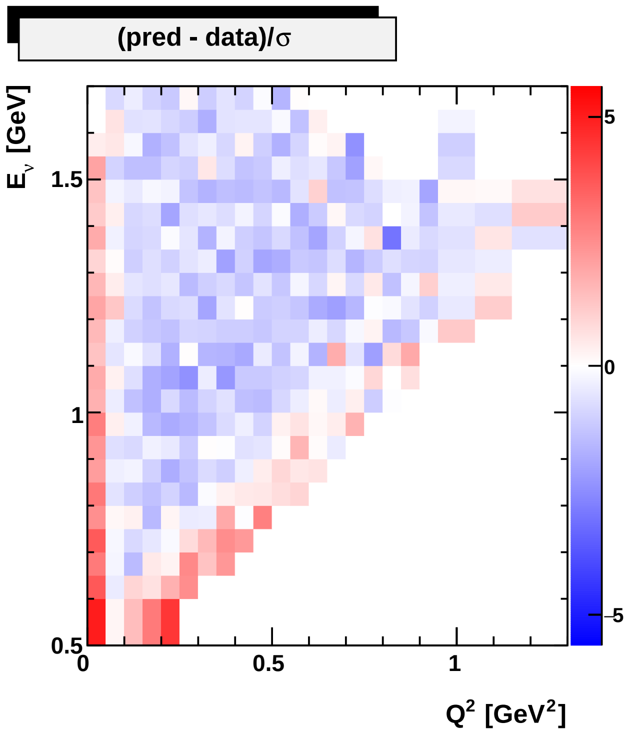
trunk:G00_00a:miniboone_fhc

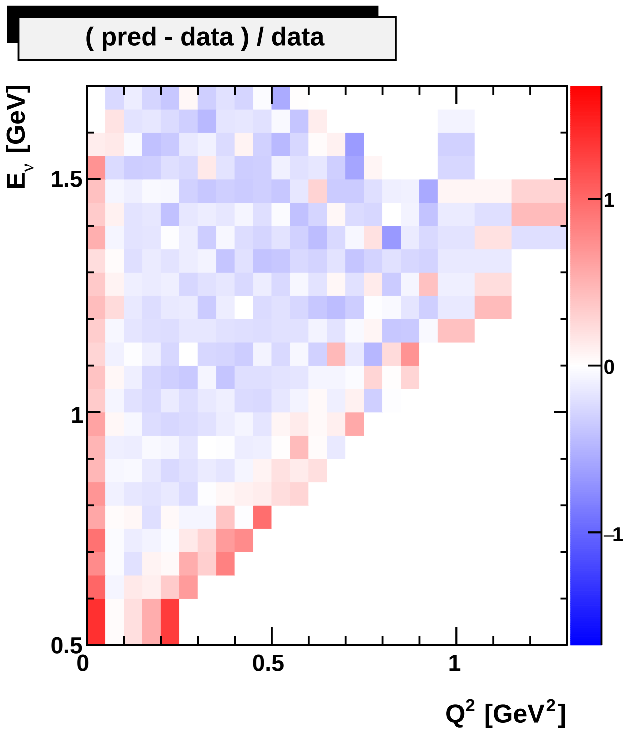
$d\sigma/dQ^2$

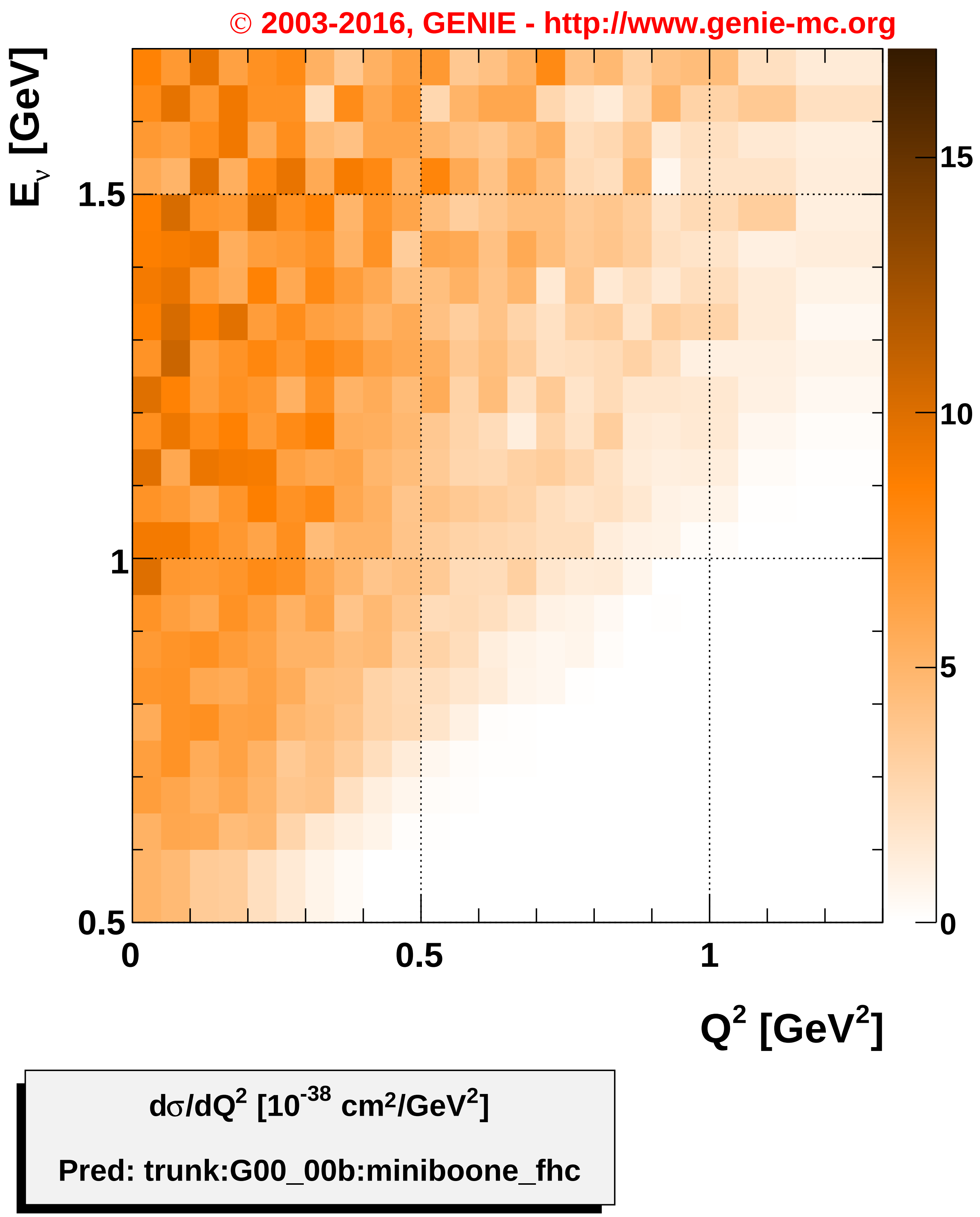
$[10^{-38}\ cm^2/GeV^2]$

χ^2 = 530.758/351 DoF








© 2003-2016, GENIE - http://www.genie-mc.org
E_ν [GeV]
0.5
1
1.5
0
0.5
1
Q^2 [GeV^2]
0
5
10
15
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
Pred: trunk:G00_00b:miniboone_fhc

miniboone_nucc1pip_2011

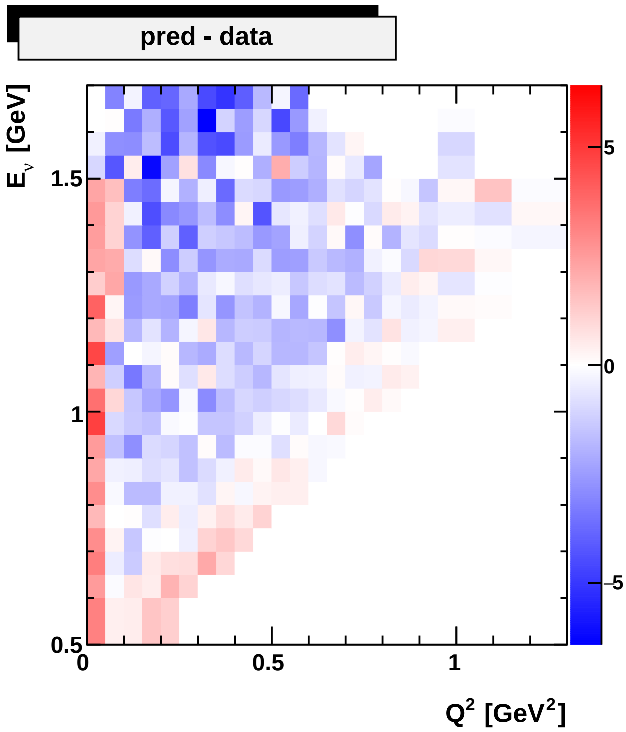
VS

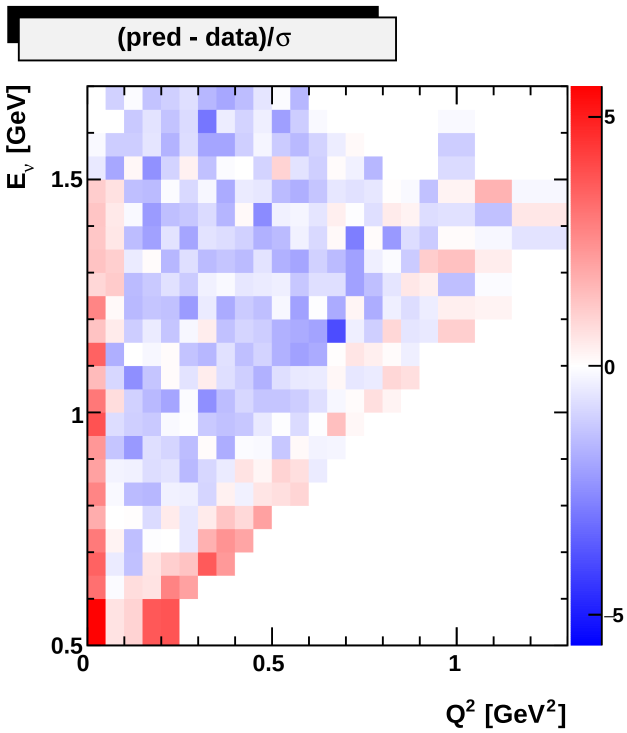
trunk:G00_00b:miniboone_fhc

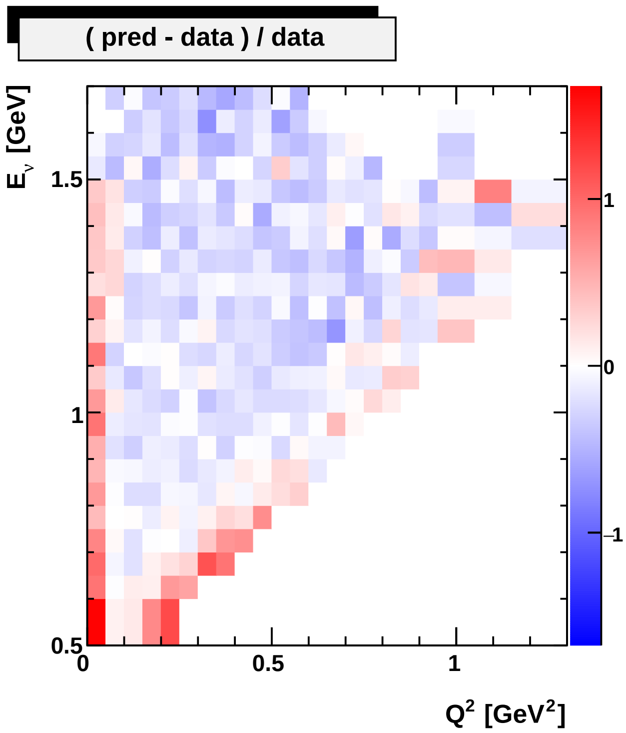
$d\sigma/dQ^2$

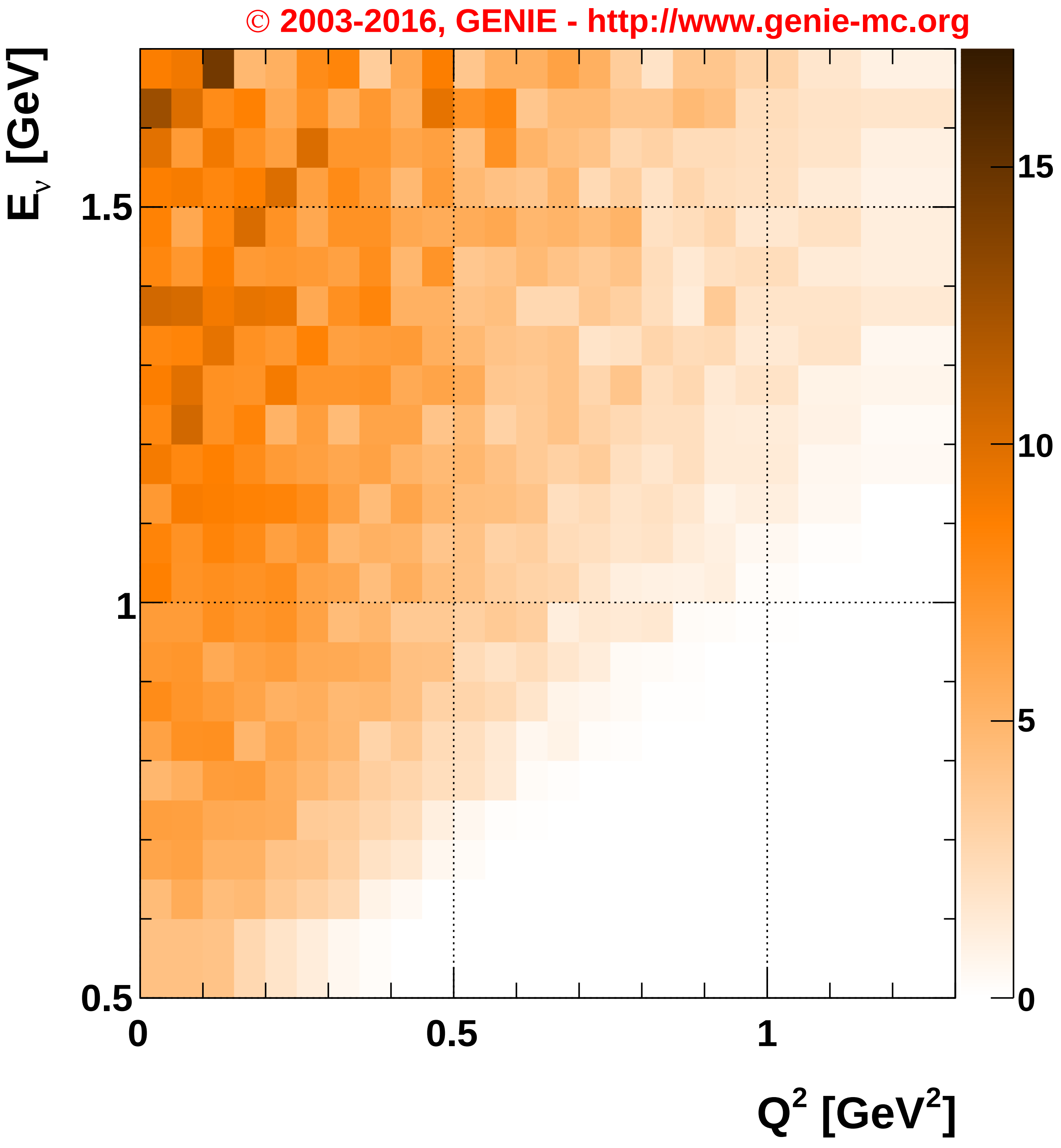
$[10^{-38}\ cm^2/GeV^2]$

χ^2 = 596.956/351 DoF









$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]

Pred: trunk:G16_01a:miniboone_fhc

miniboone_nucc1pip_2011

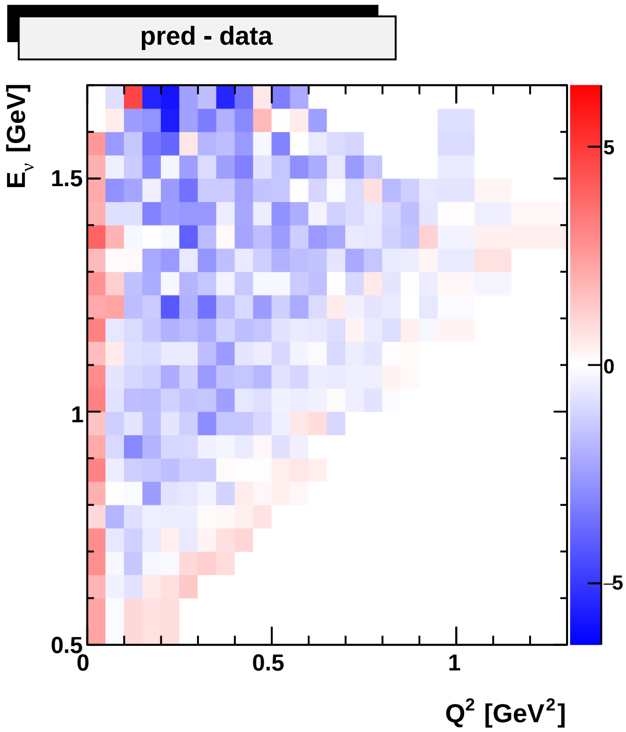
VS

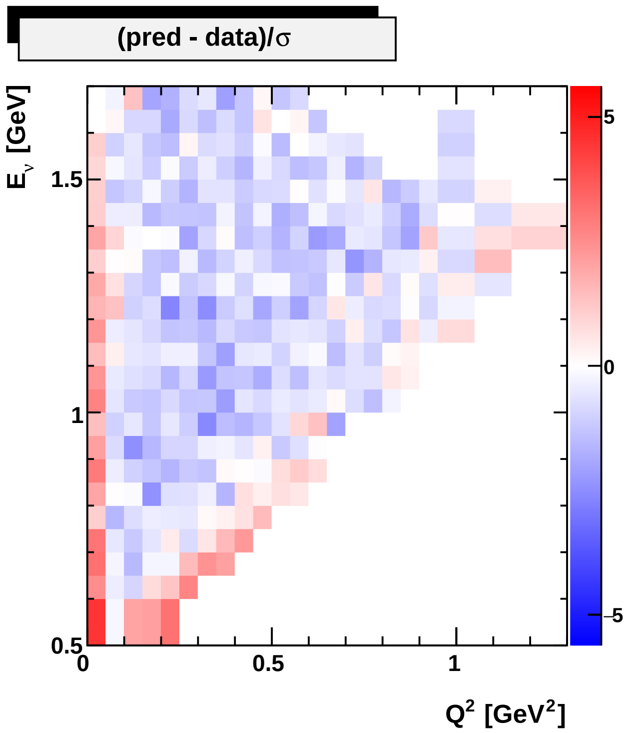
trunk:G16_01a:miniboone_fhc

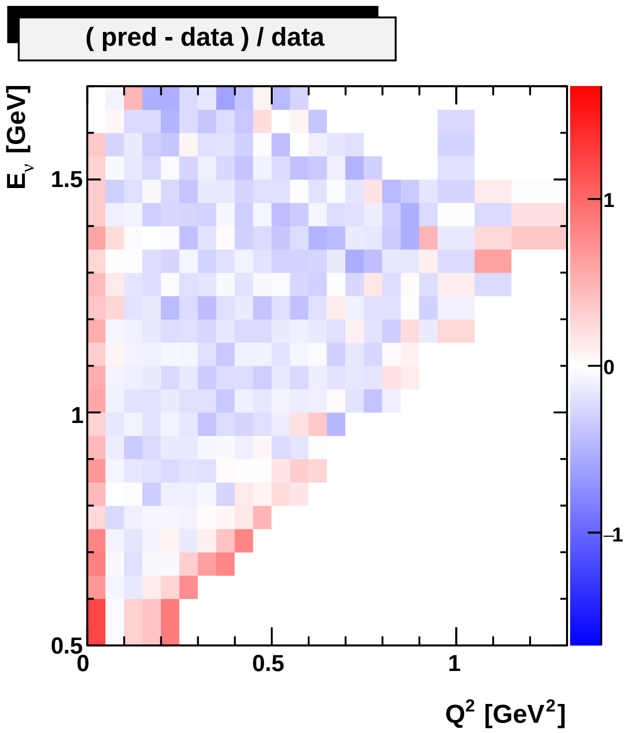
$d\sigma/dQ^2$

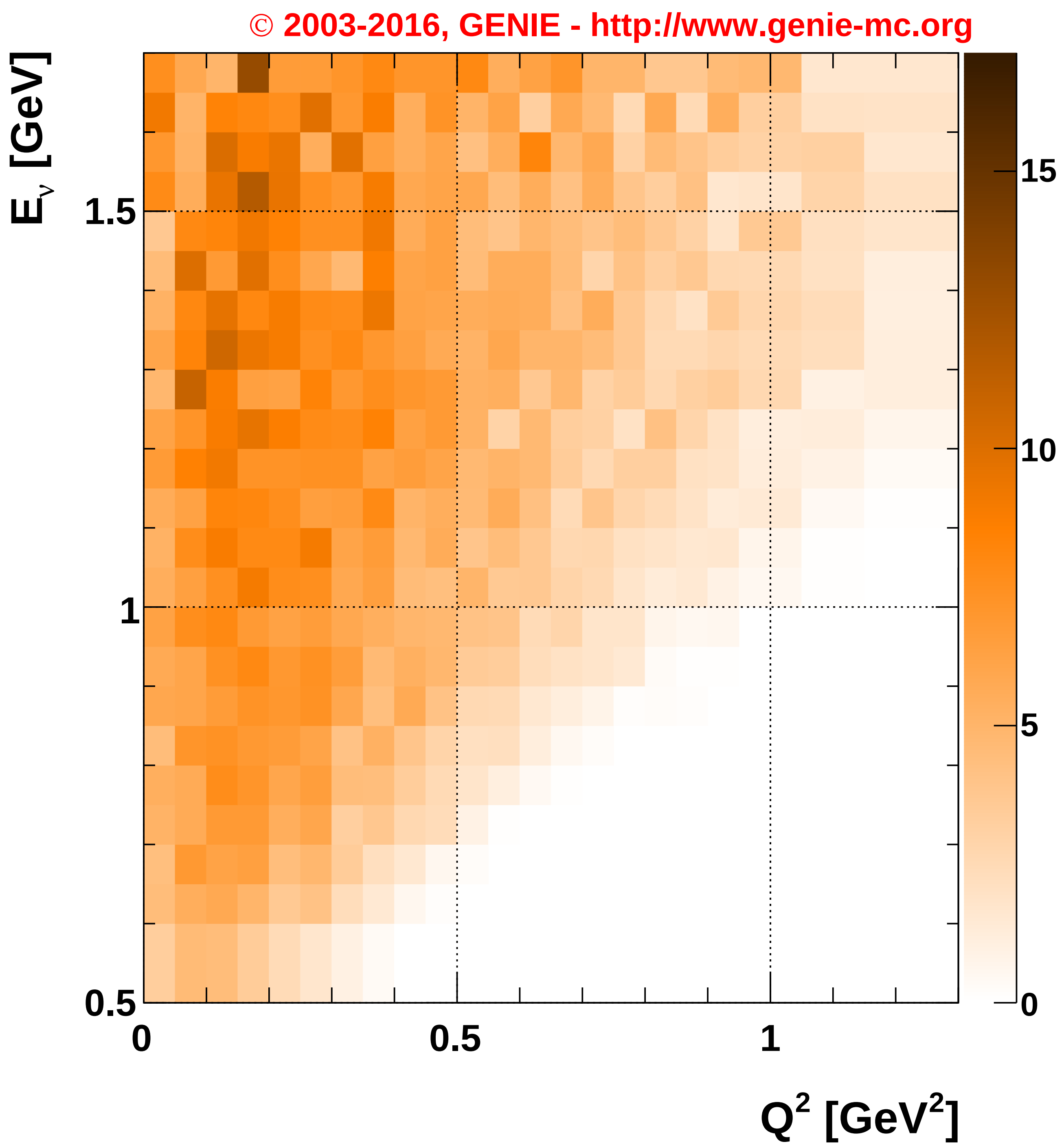
$[10^{-38}\ cm^2/GeV^2]$

χ^2 = 484.41/351 DoF









$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]

Pred: trunk:G16_02b:miniboone_fhc

miniboone_nucc1pip_2011

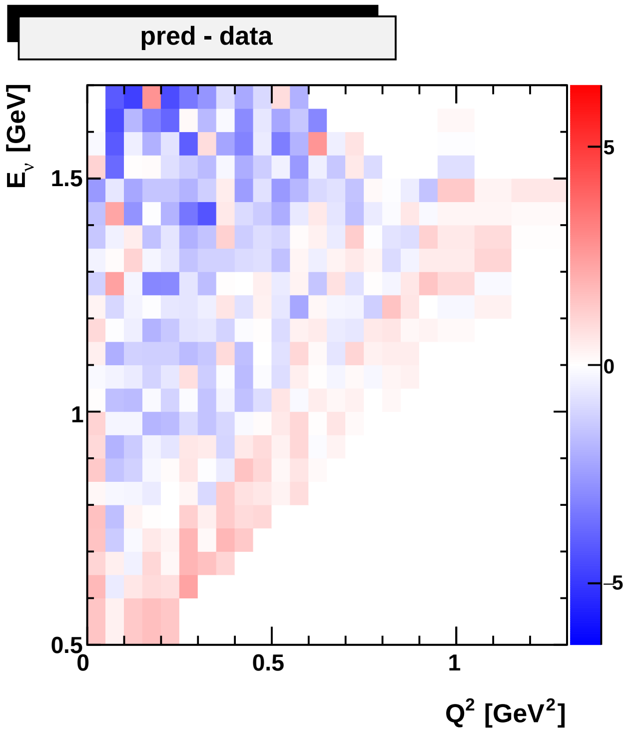
VS

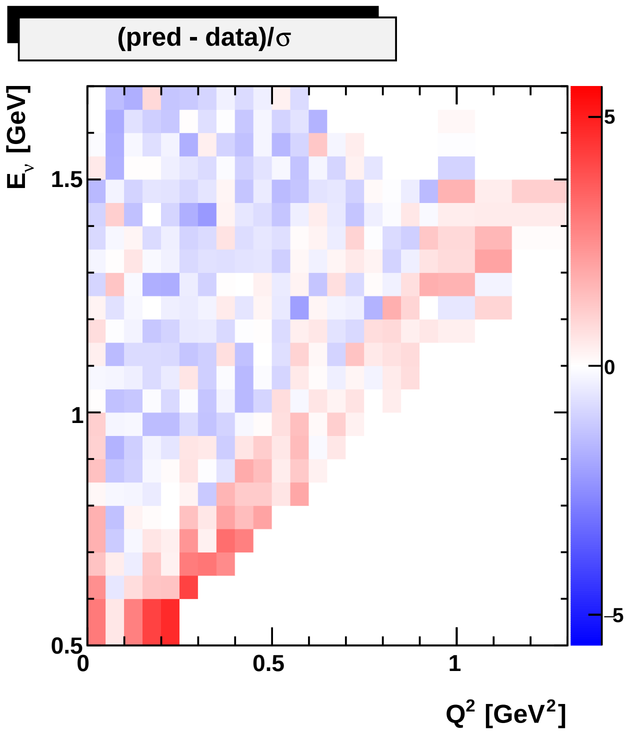
trunk:G16_02b:miniboone_fhc

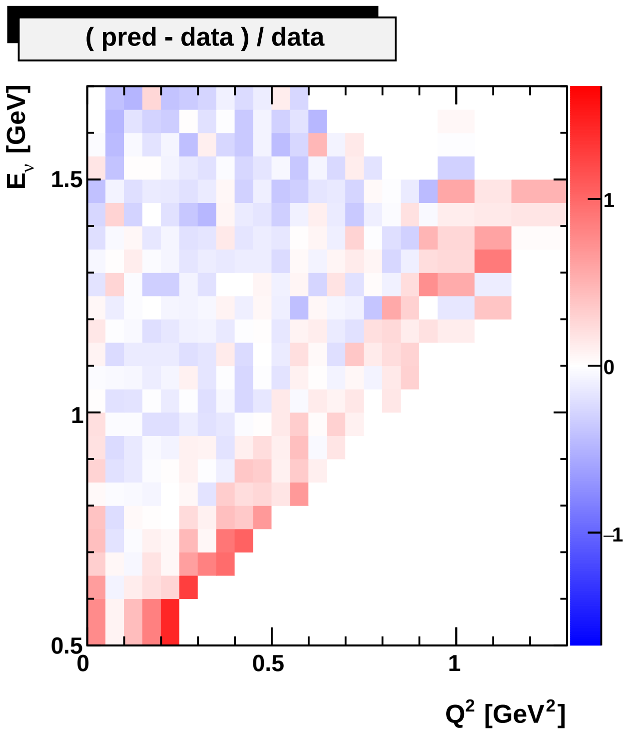
$d\sigma/dQ^2$

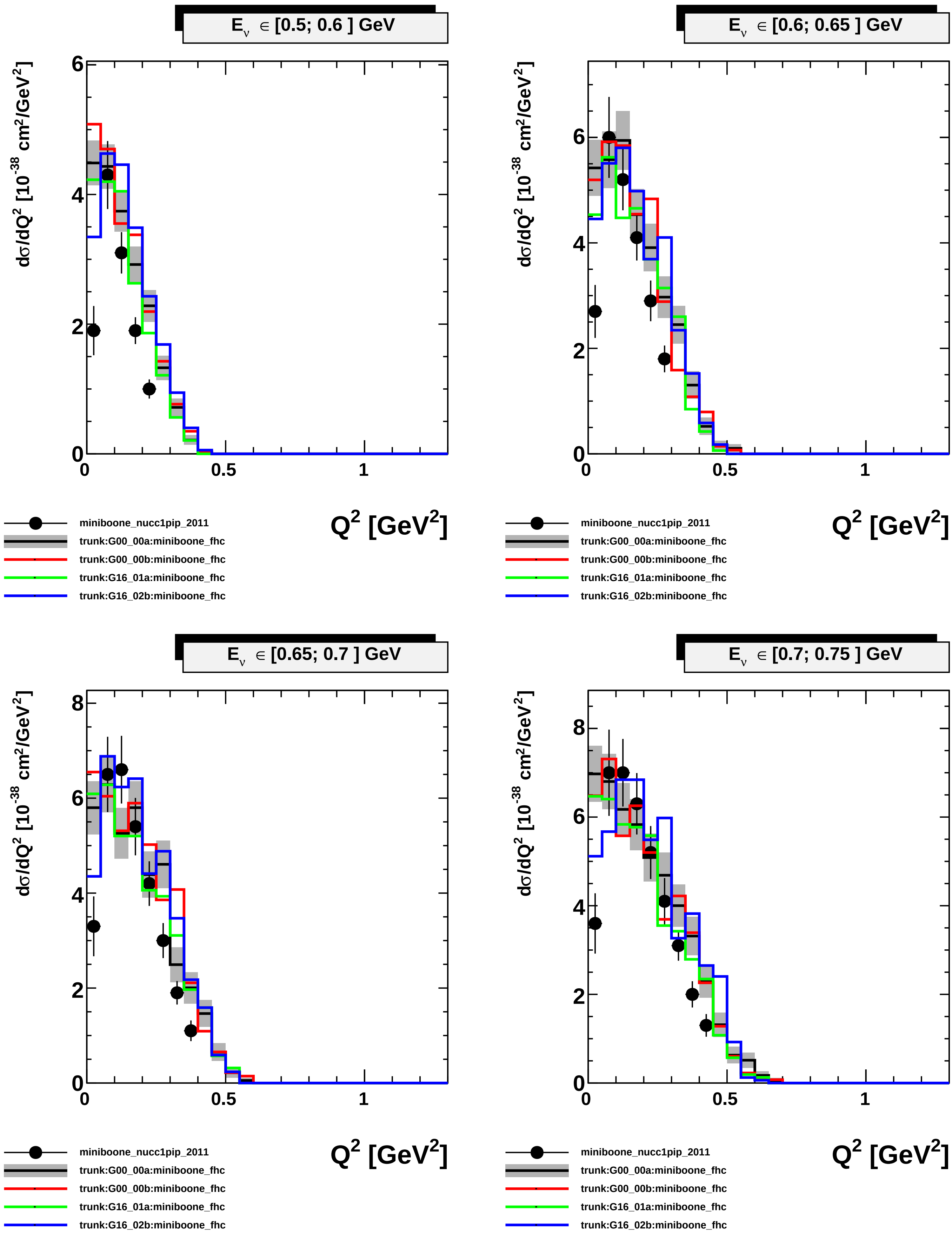
$[10^{-38}\ cm^2/GeV^2]$

χ^2 = 390.283/351 DoF

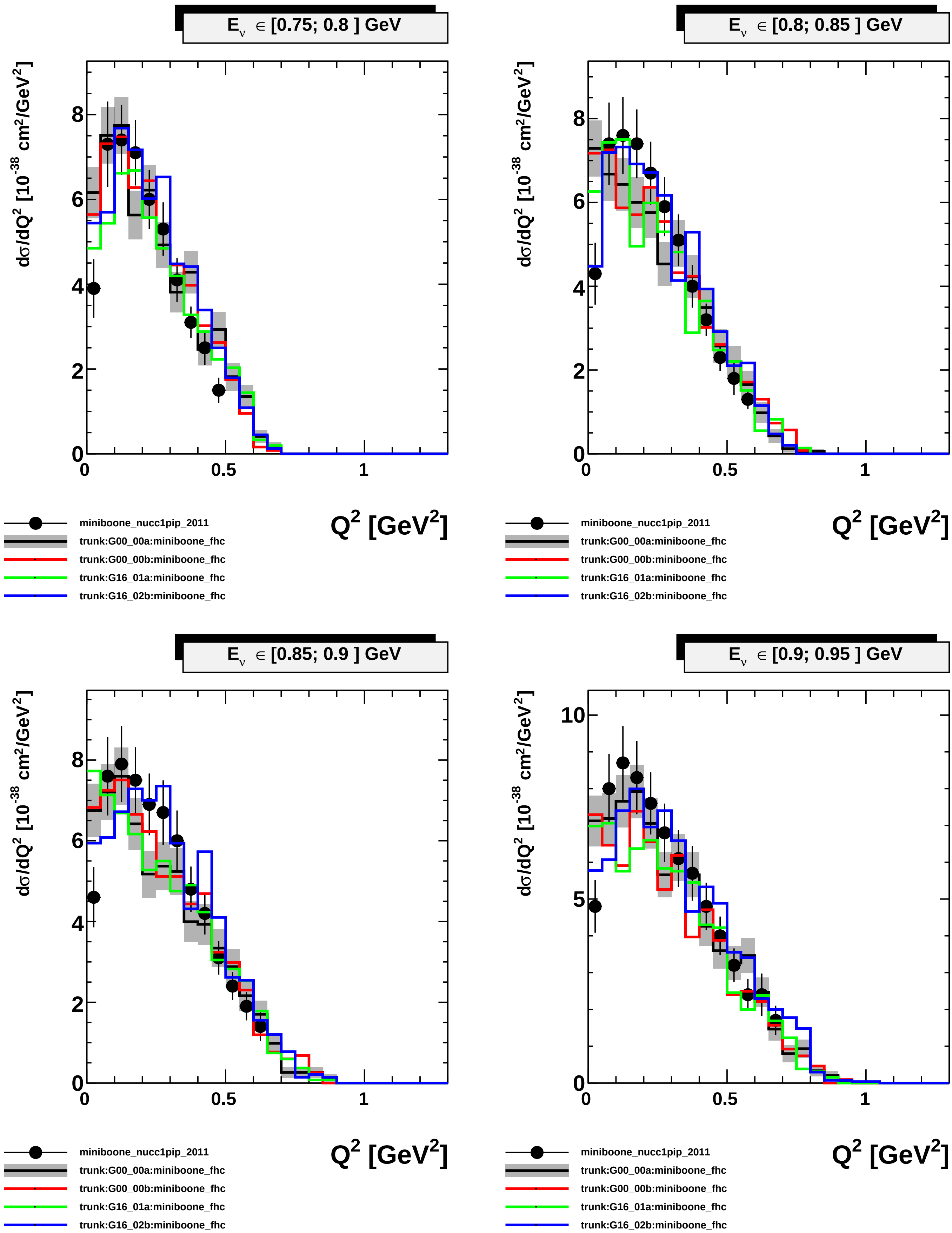




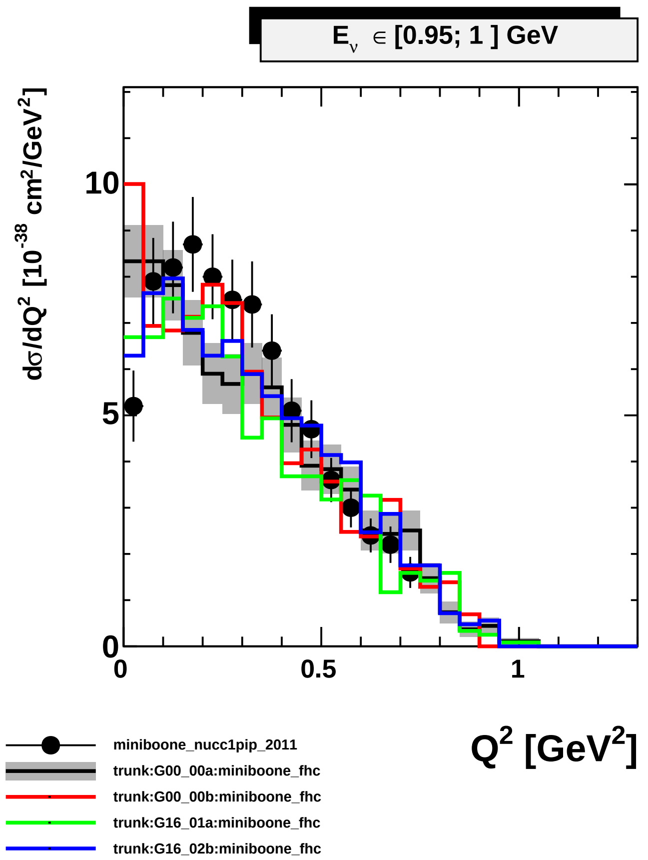




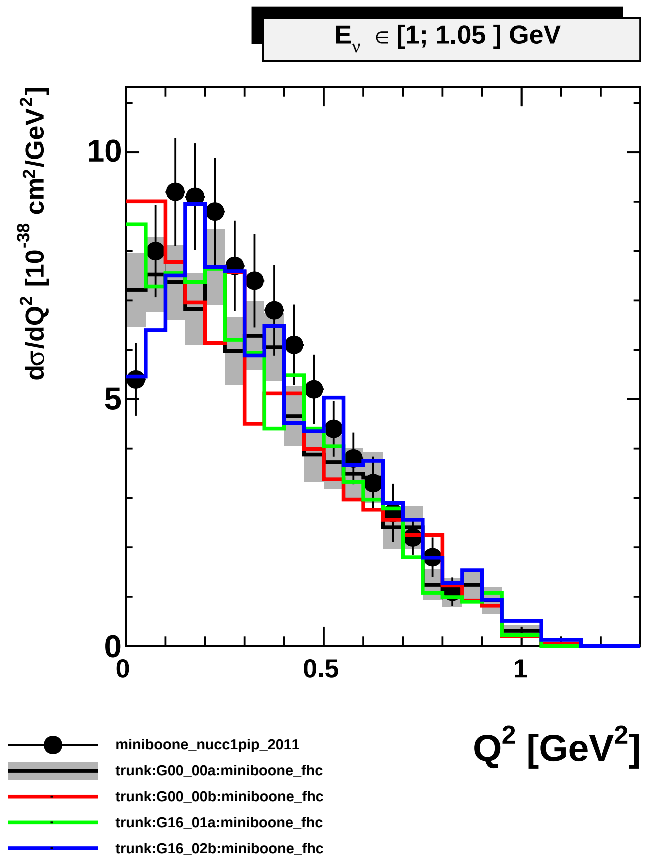
E_ν ∈ [0.5; 0.6] GeV
E_ν ∈ [0.6; 0.65] GeV
E_ν ∈ [0.65; 0.7] GeV
E_ν ∈ [0.7; 0.75] GeV
dσ/dQ² [10⁻³⁸ cm²/GeV²]
Q² [GeV²]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



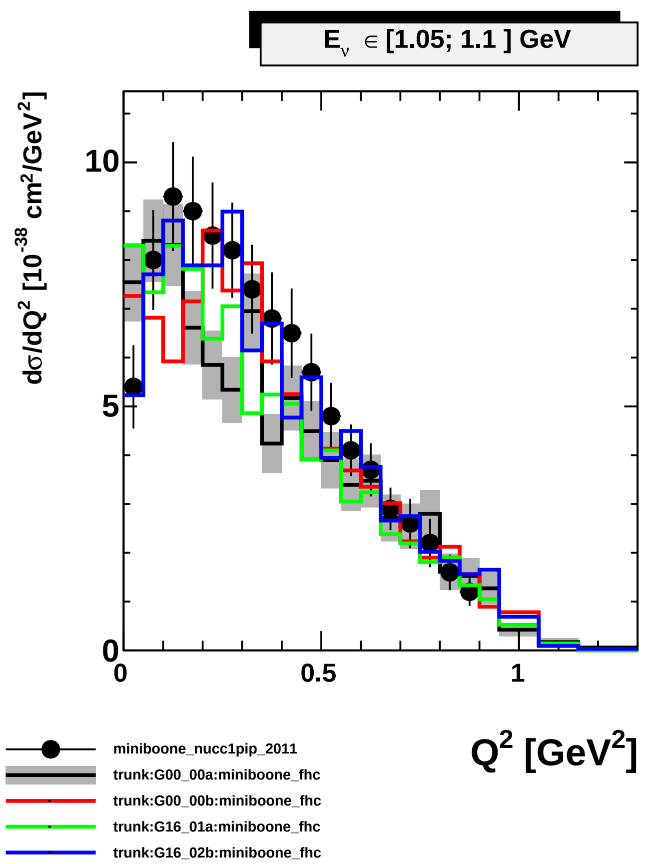
E_ν ∈ [0.75; 0.8] GeV
E_ν ∈ [0.8; 0.85] GeV
E_ν ∈ [0.85; 0.9] GeV
E_ν ∈ [0.9; 0.95] GeV
dσ/dQ² [10⁻³⁸ cm²/GeV²]
Q² [GeV²]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



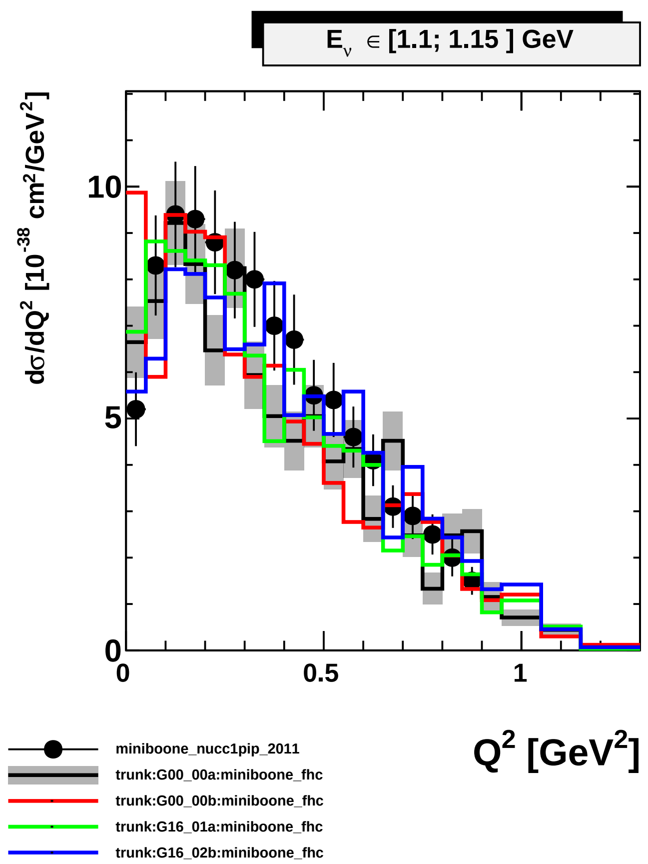
$E_\nu \in [0.95; 1\ ]$ GeV
$d\sigma/dQ^2\ [10^{-38}\ cm^2/GeV^2]$
$Q^2\ [GeV^2]$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



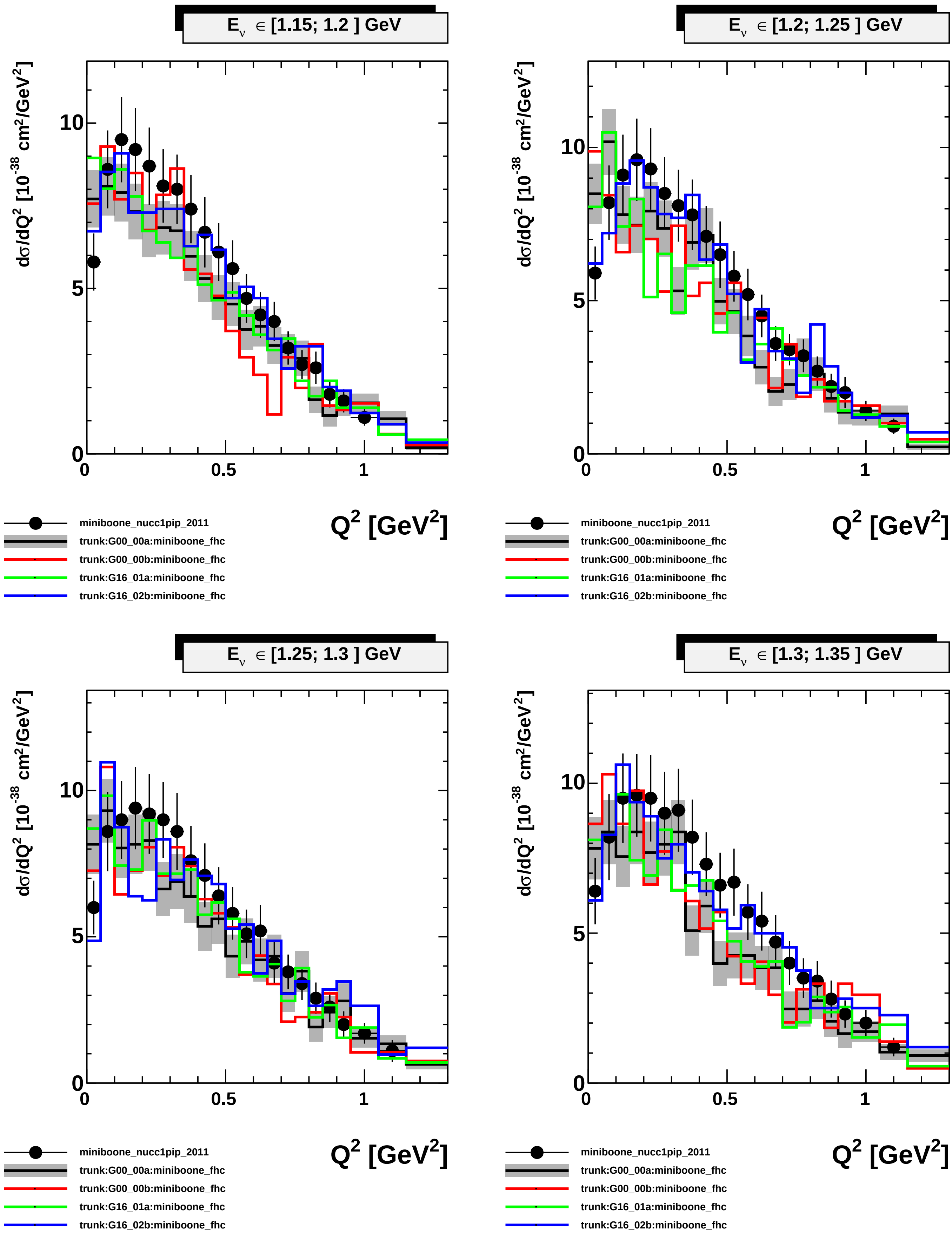
$E_\nu \in [1; 1.05\ ]$ GeV
$d\sigma/dQ^2\ [10^{-38}\ cm^2/GeV^2]$
$Q^2\ [GeV^2]$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



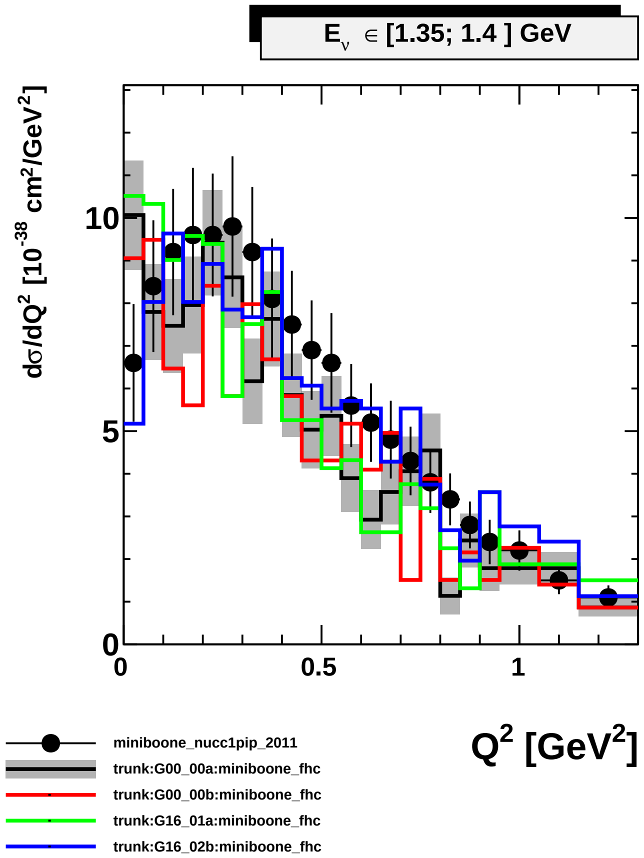
$E_\nu \in [1.05; 1.1\ ]$ GeV
$d\sigma/dQ^2\ [10^{-38}\ cm^2/GeV^2]$
$Q^2\ [GeV^2]$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

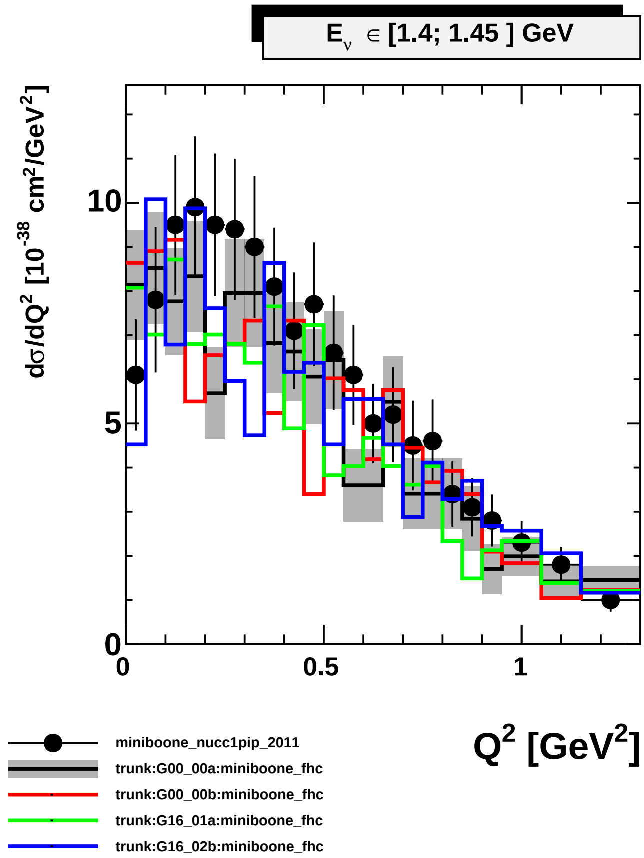


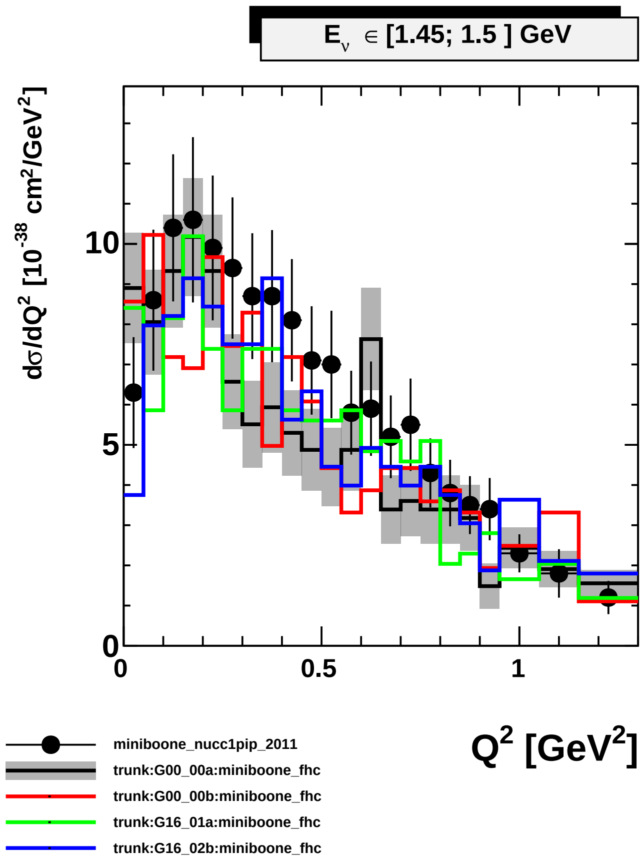
$E_\nu \in [1.1; 1.15\ ]$ GeV
$d\sigma/dQ^2\ [10^{-38}\ cm^2/GeV^2]$
$Q^2\ [GeV^2]$
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

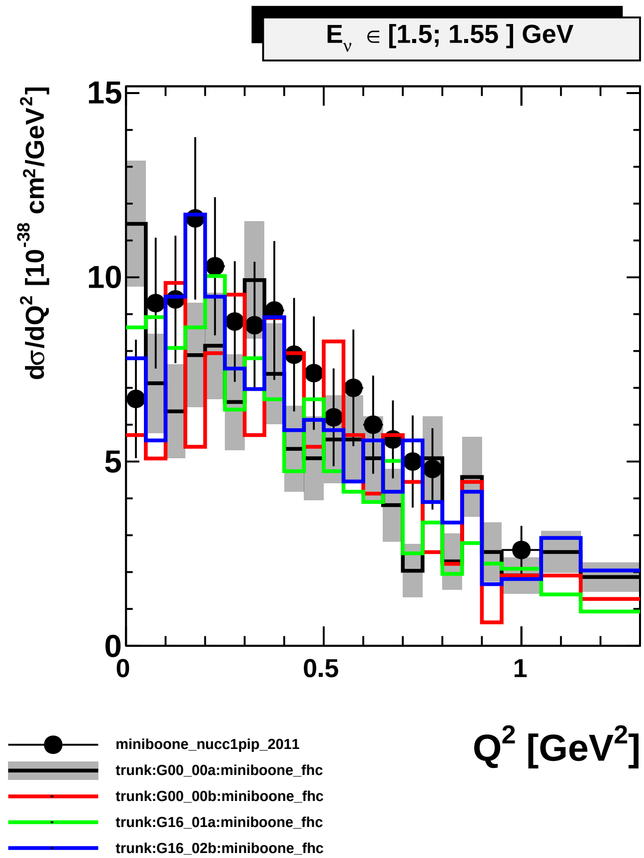


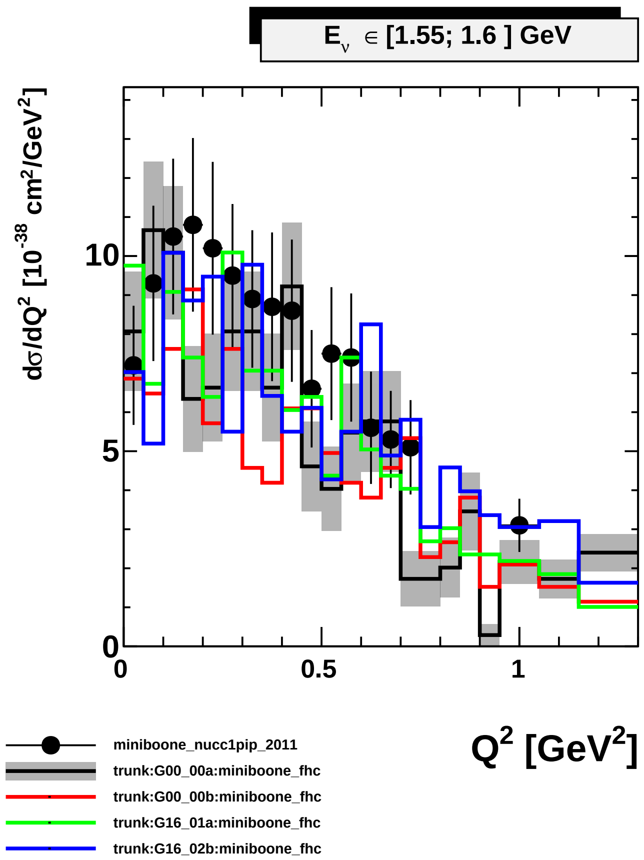
E_ν ∈ [1.15; 1.2] GeV
E_ν ∈ [1.2; 1.25] GeV
E_ν ∈ [1.25; 1.3] GeV
E_ν ∈ [1.3; 1.35] GeV
dσ/dQ² [10⁻³⁸ cm²/GeV²]
Q² [GeV²]
0
5
10
0.5
1
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


E_ν ∈ [1.35; 1.4] GeV
dσ/dQ² [10⁻³⁸ cm²/GeV²]
Q² [GeV²]
0
5
10
0.5
1
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

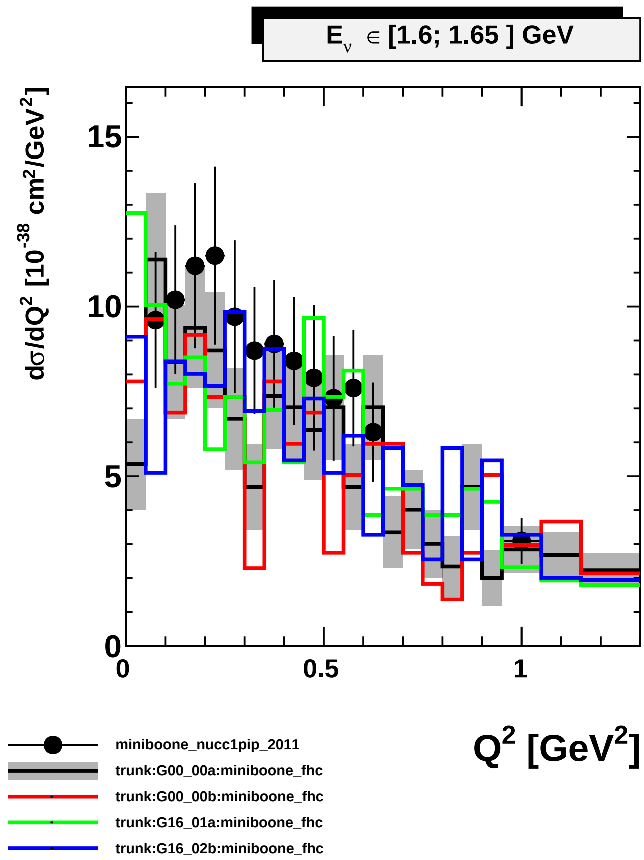

E_ν ∈ [1.4; 1.45] GeV
dσ/dQ² [10⁻³⁸ cm²/GeV²]
Q² [GeV²]
0
5
10
0.5
1
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


E_ν ∈ [1.45; 1.5] GeV
dσ/dQ² [10⁻³⁸ cm²/GeV²]
Q² [GeV²]
0
5
10
0.5
1
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

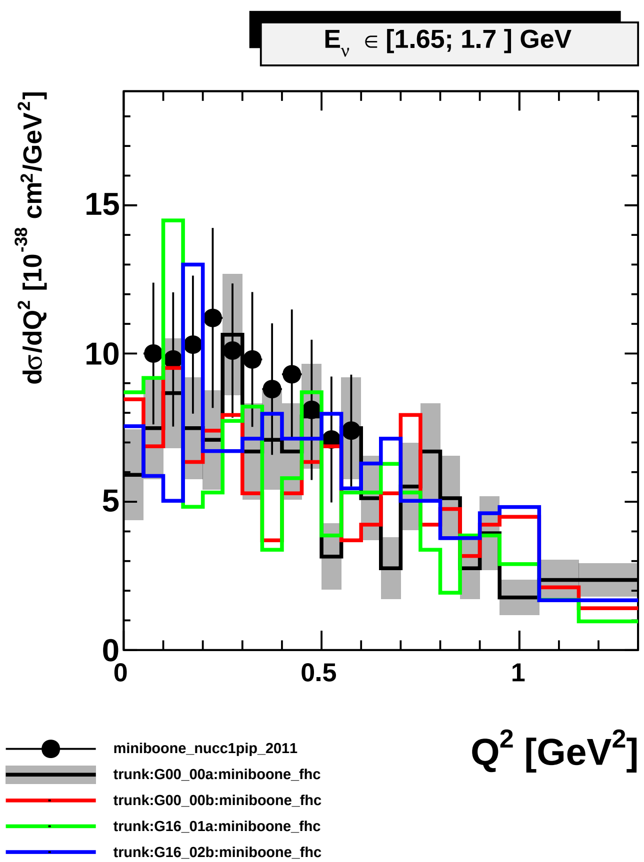

E_ν ∈ [1.5; 1.55] GeV
dσ/dQ² [10⁻³⁸ cm²/GeV²]
Q² [GeV²]
0
5
10
15
0.5
1
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



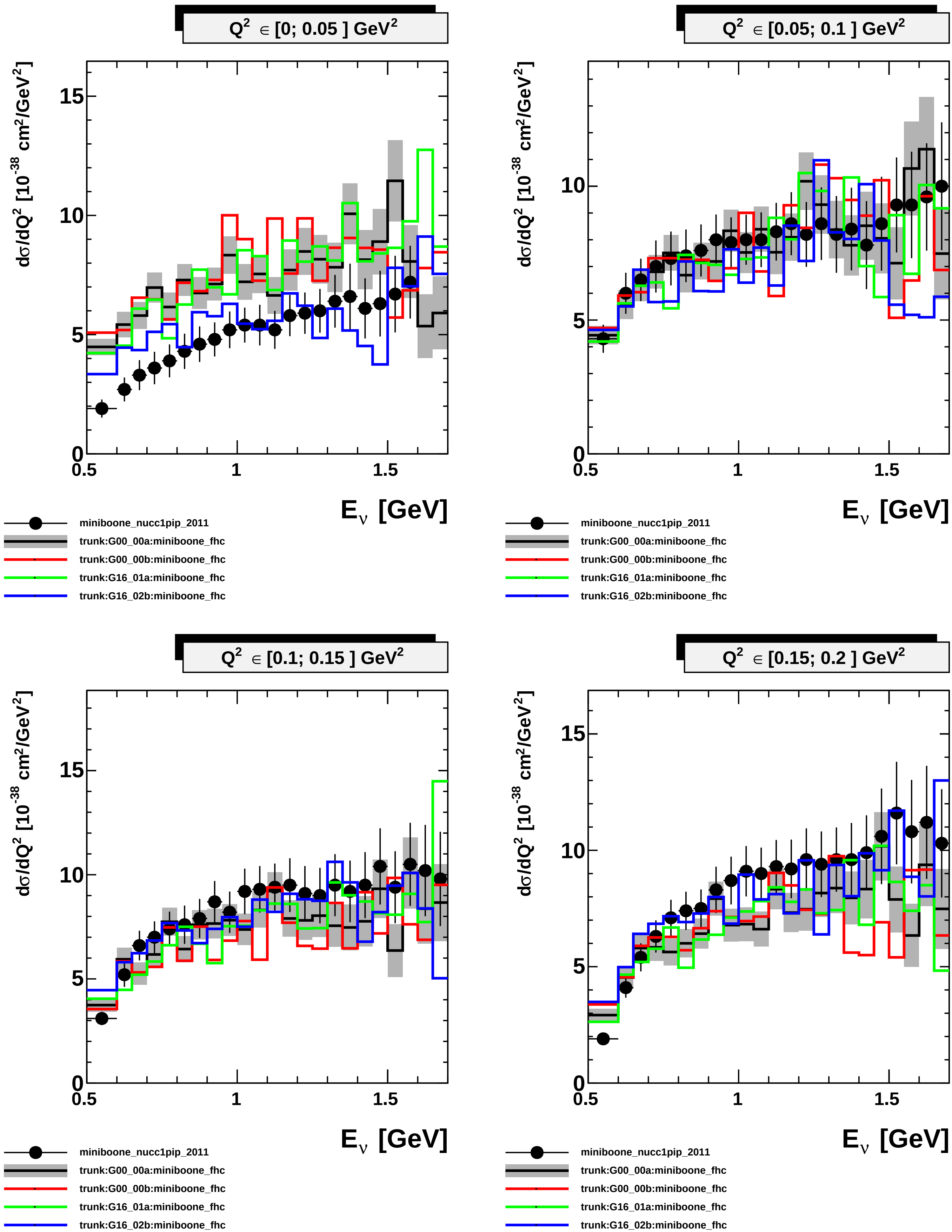
$E_\nu \in [1.55; 1.6]$ GeV
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
Q^2 [GeV^2]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



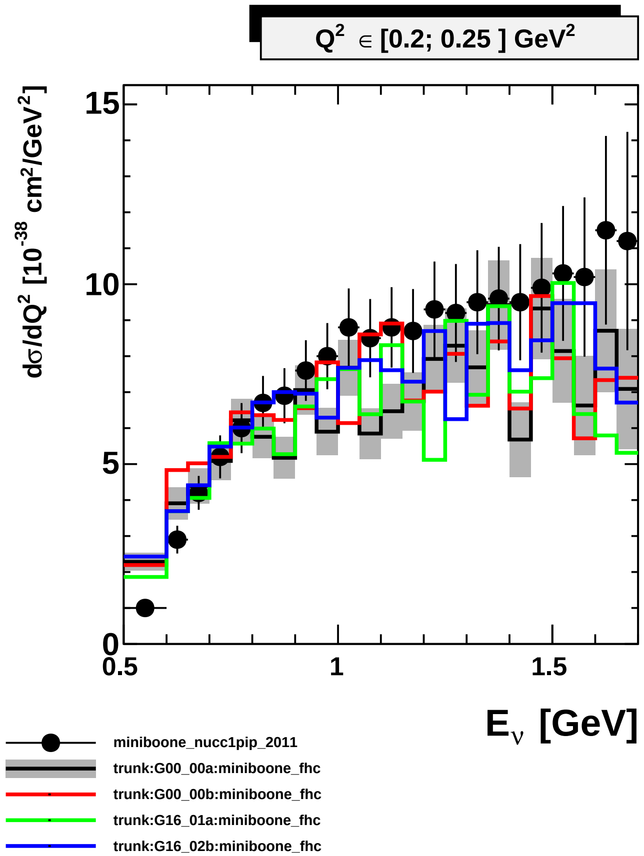
$E_\nu \in [1.6; 1.65]$ GeV
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
Q^2 [GeV^2]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



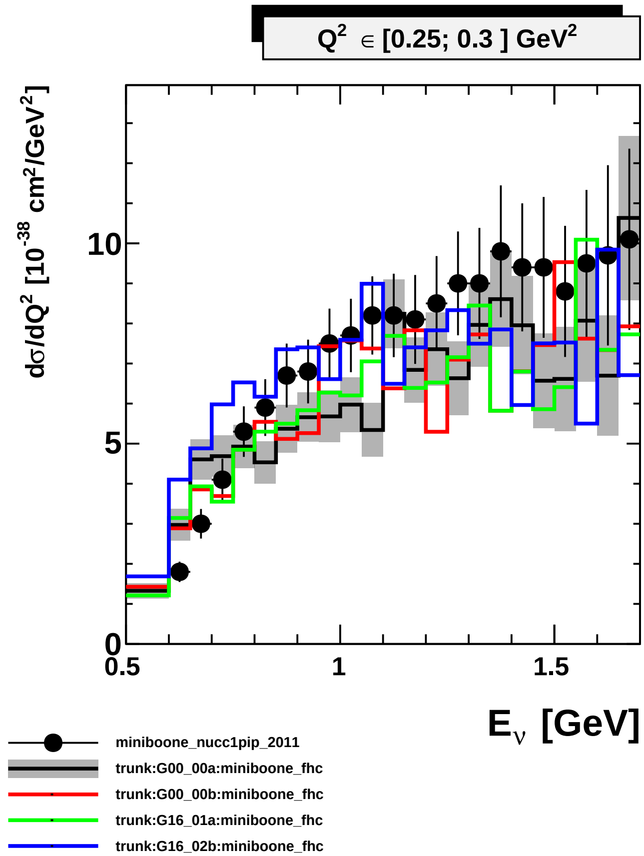
$E_\nu \in [1.65; 1.7]$ GeV
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
Q^2 [GeV^2]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



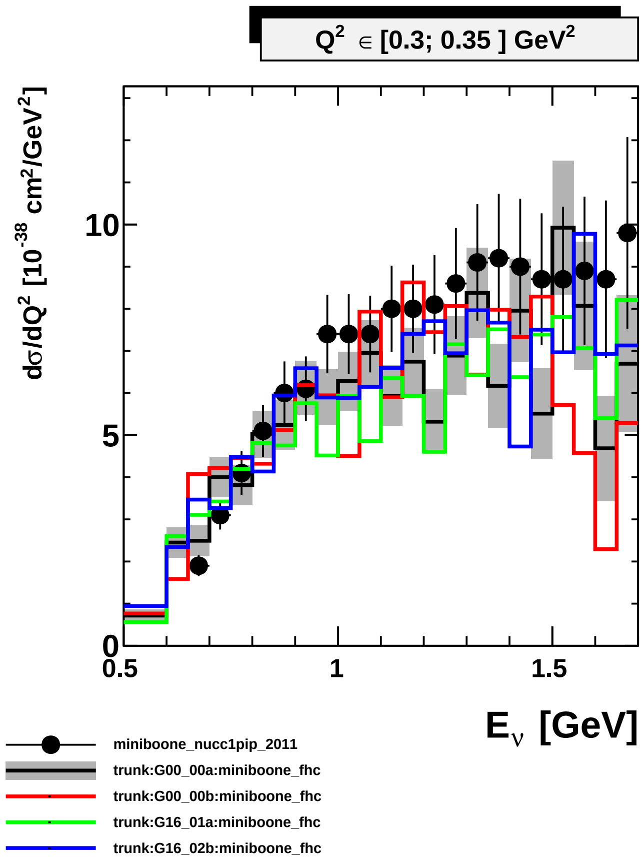
$Q^2 \in [0; 0.05]$ GeV^2
$Q^2 \in [0.05; 0.1]$ GeV^2
$Q^2 \in [0.1; 0.15]$ GeV^2
$Q^2 \in [0.15; 0.2]$ GeV^2
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



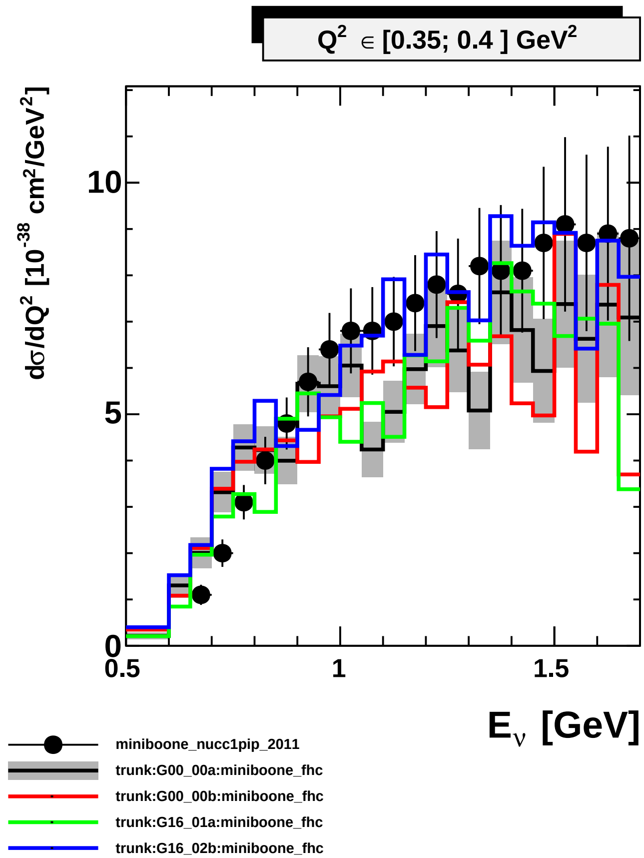
Q² ∈ [0.2; 0.25] GeV²
dσ/dQ² [10⁻³⁸ cm²/GeV²]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



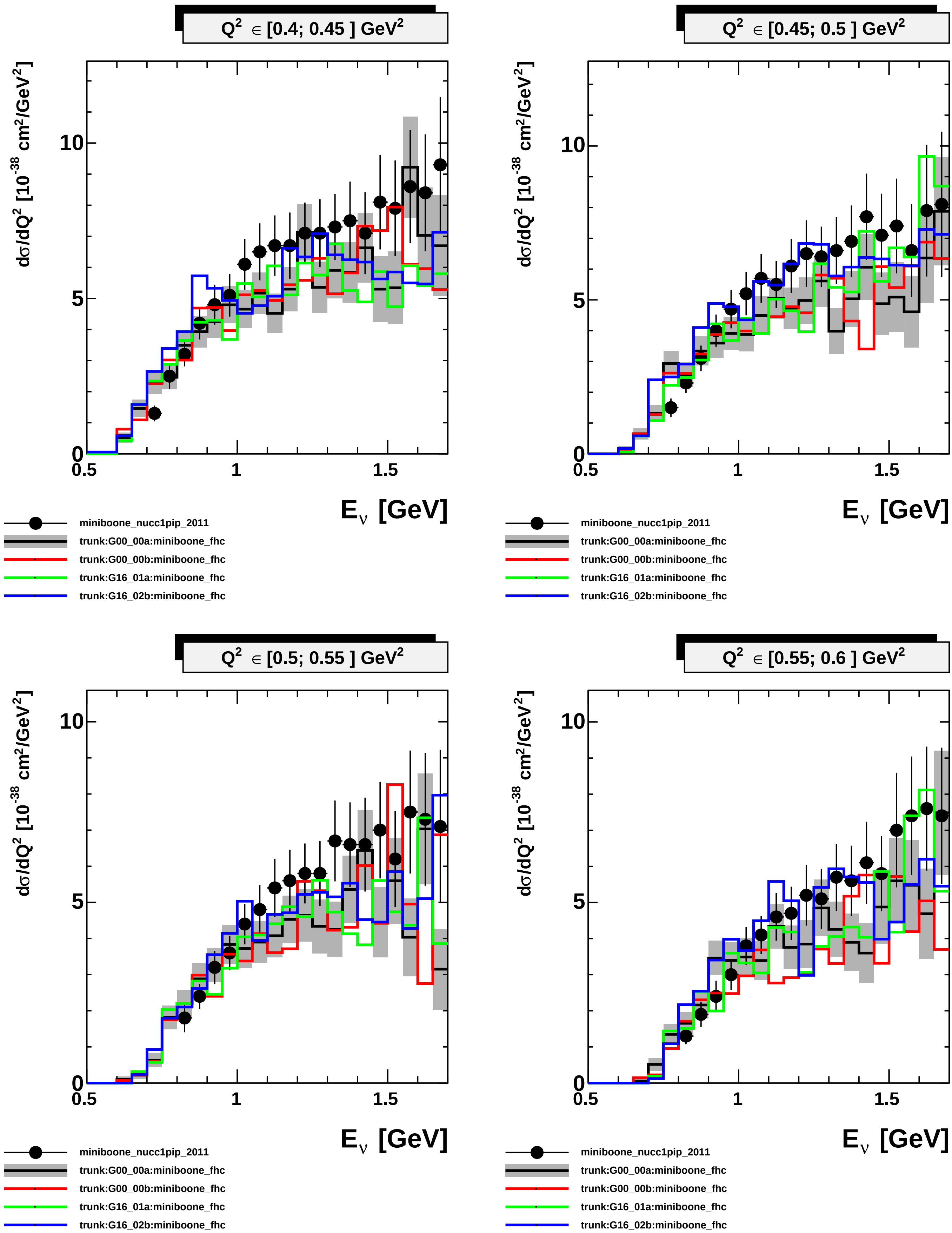
Q² ∈ [0.25; 0.3] GeV²
dσ/dQ² [10⁻³⁸ cm²/GeV²]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

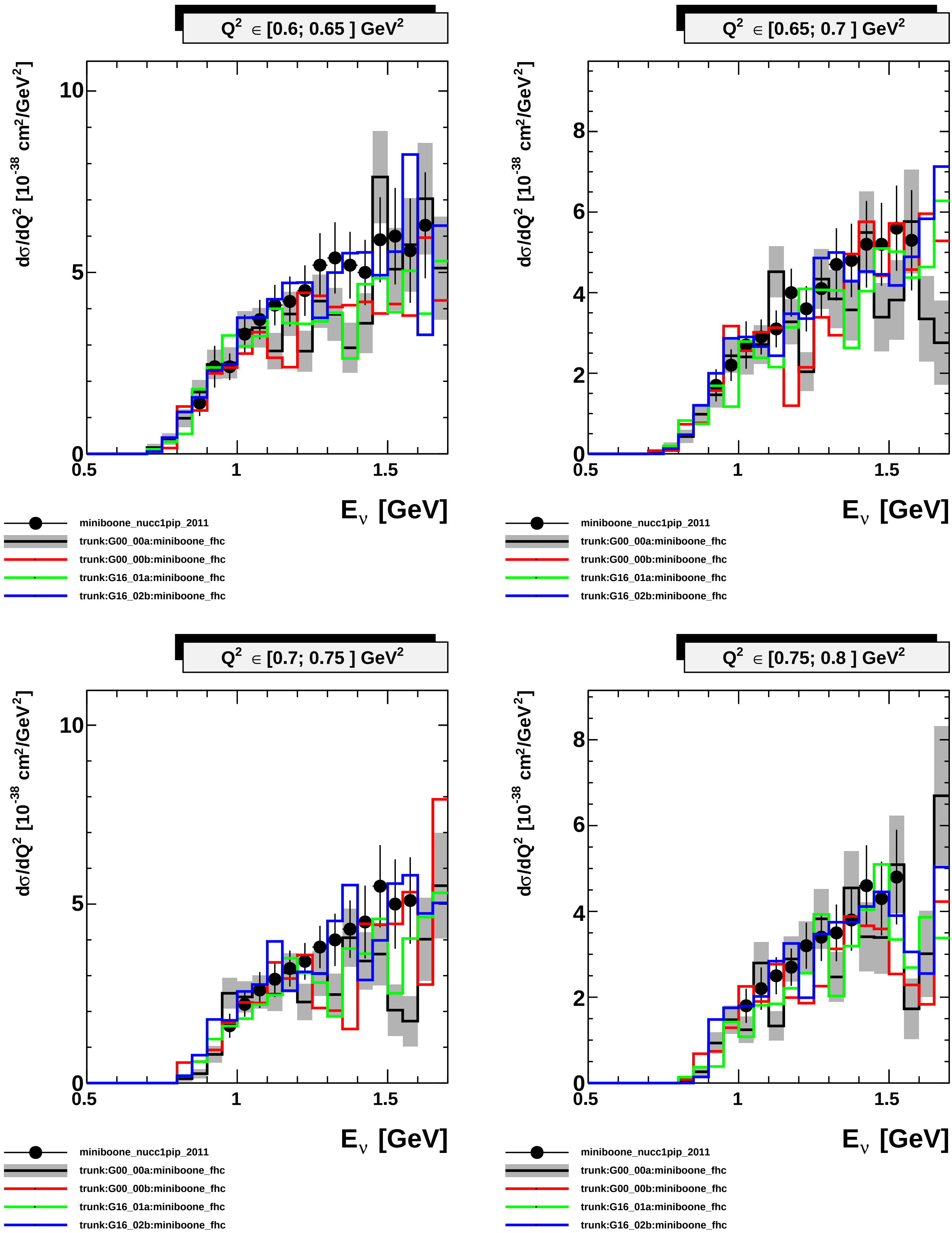


Q² ∈ [0.3; 0.35] GeV²
dσ/dQ² [10⁻³⁸ cm²/GeV²]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

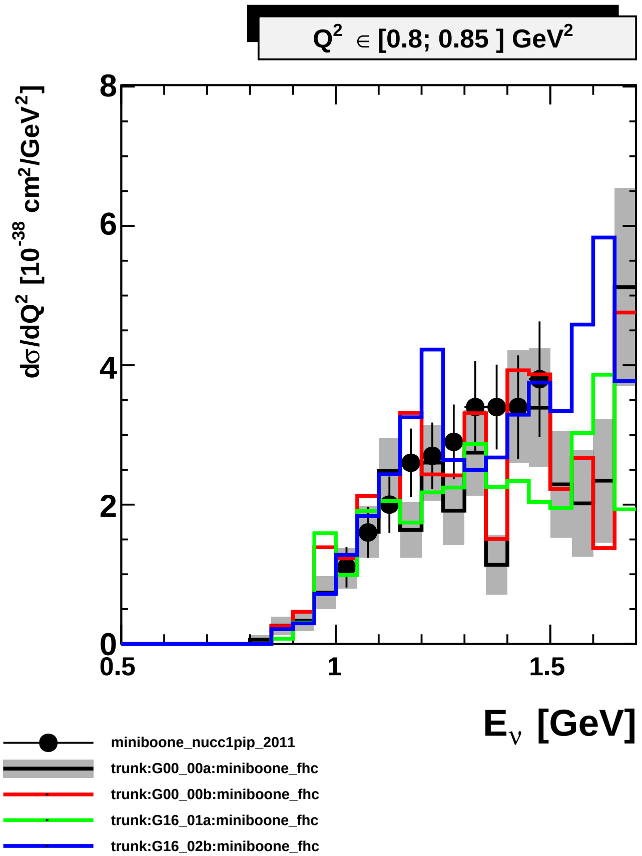


Q² ∈ [0.35; 0.4] GeV²
dσ/dQ² [10⁻³⁸ cm²/GeV²]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

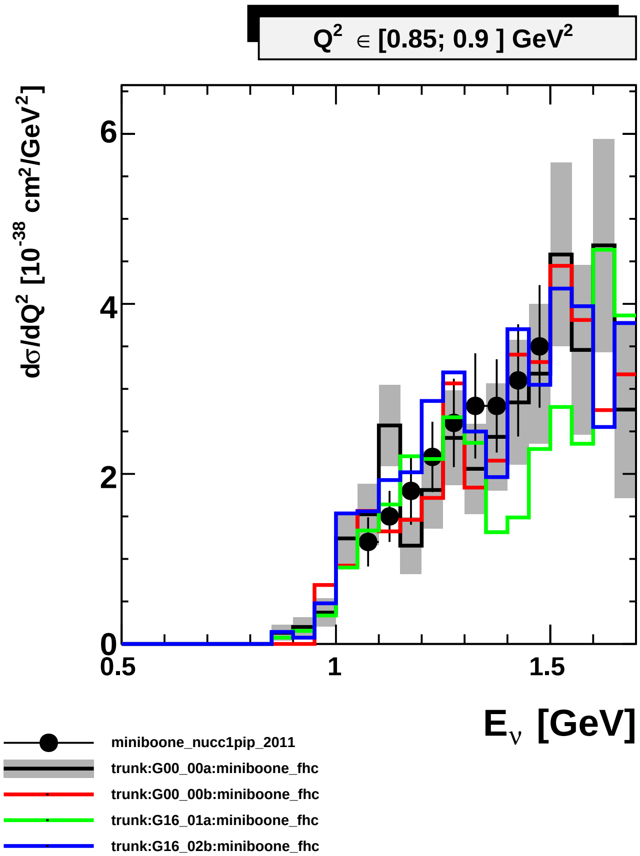

Q^2 ∈ [0.4; 0.45] GeV^2
Q^2 ∈ [0.45; 0.5] GeV^2
Q^2 ∈ [0.5; 0.55] GeV^2
Q^2 ∈ [0.55; 0.6] GeV^2
dσ/dQ^2 [10^{-38} cm^2/GeV^2]
E$_\nu$ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



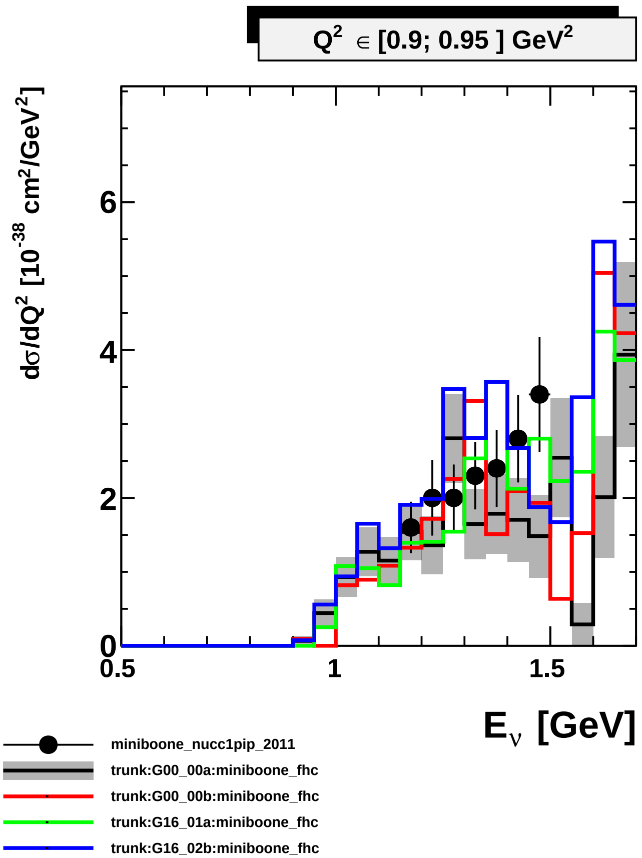
Q^2 ∈ [0.6; 0.65] GeV^2
Q^2 ∈ [0.65; 0.7] GeV^2
Q^2 ∈ [0.7; 0.75] GeV^2
Q^2 ∈ [0.75; 0.8] GeV^2
dσ/dQ^2 [10^-38 cm^2/GeV^2]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



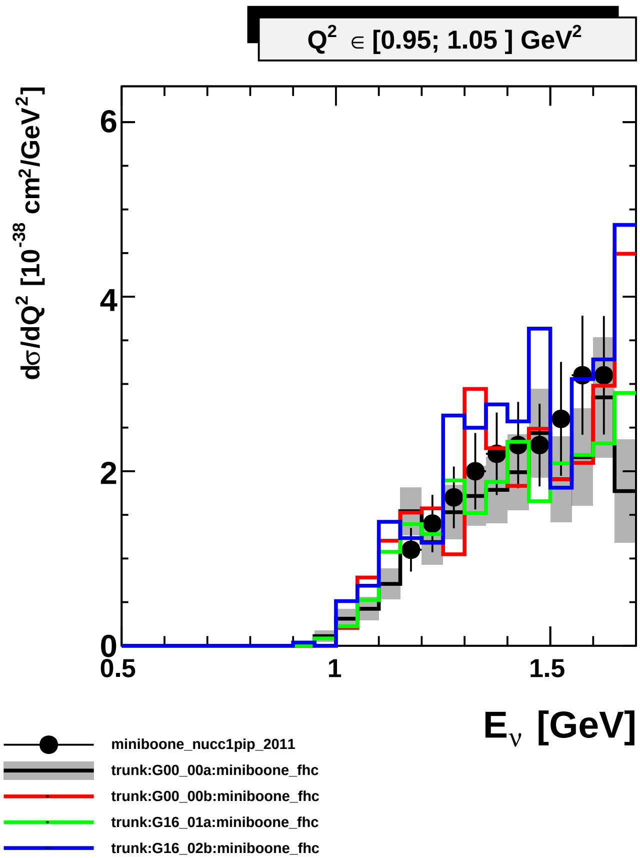
$Q^2 \in [0.8; 0.85]$ GeV^2
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
0
2
4
6
8
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



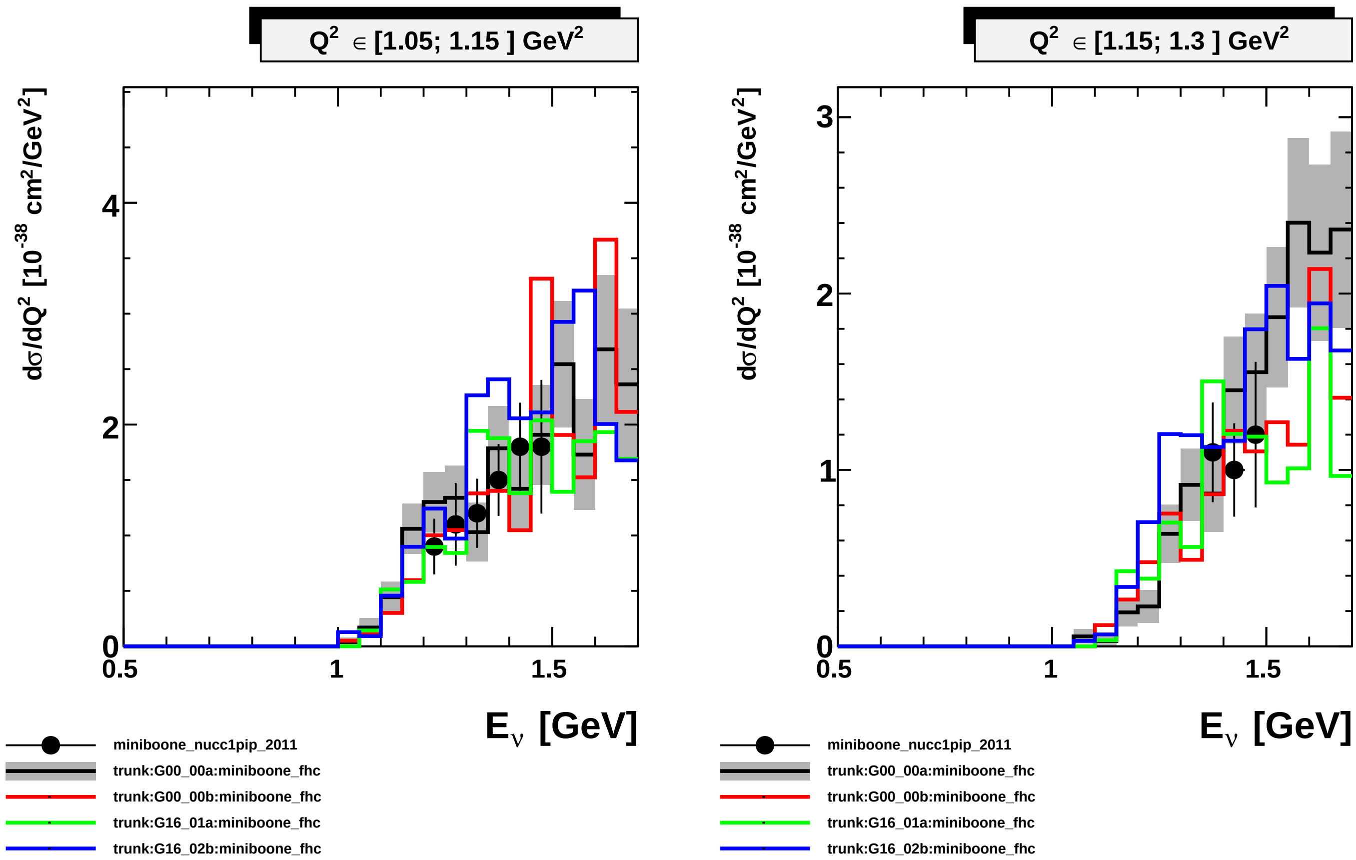
$Q^2 \in [0.85; 0.9]$ GeV^2
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
0
2
4
6
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

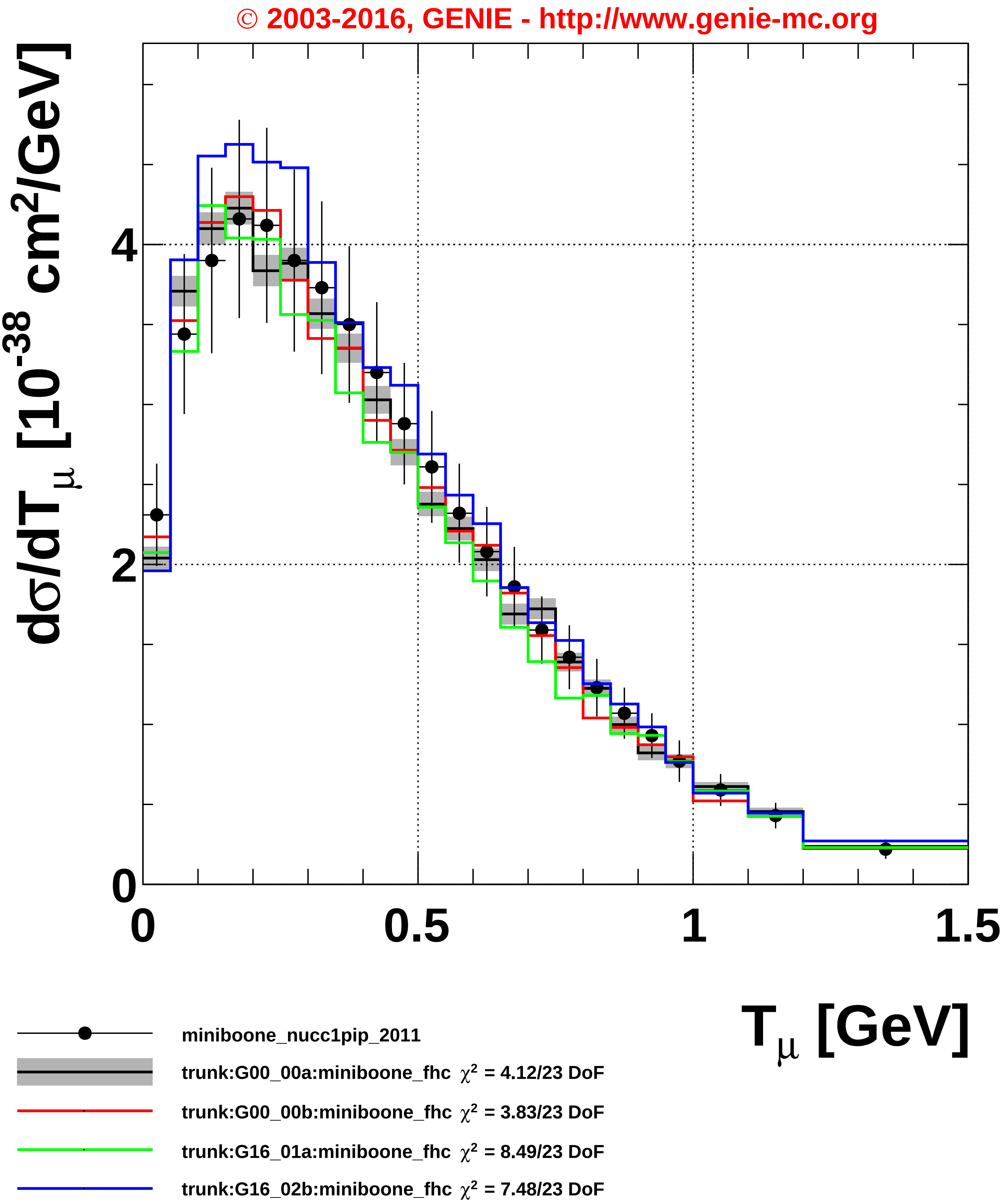


$Q^2 \in [0.9; 0.95]$ GeV^2
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
0
2
4
6
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



$Q^2 \in [0.95; 1.05]$ GeV^2
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
0
2
4
6
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$Q^2 \in [1.05; 1.15]$ GeV^2
$Q^2 \in [1.15; 1.3]$ GeV^2
$d\sigma/dQ^2$ [10^{-38} cm^2/GeV^2]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



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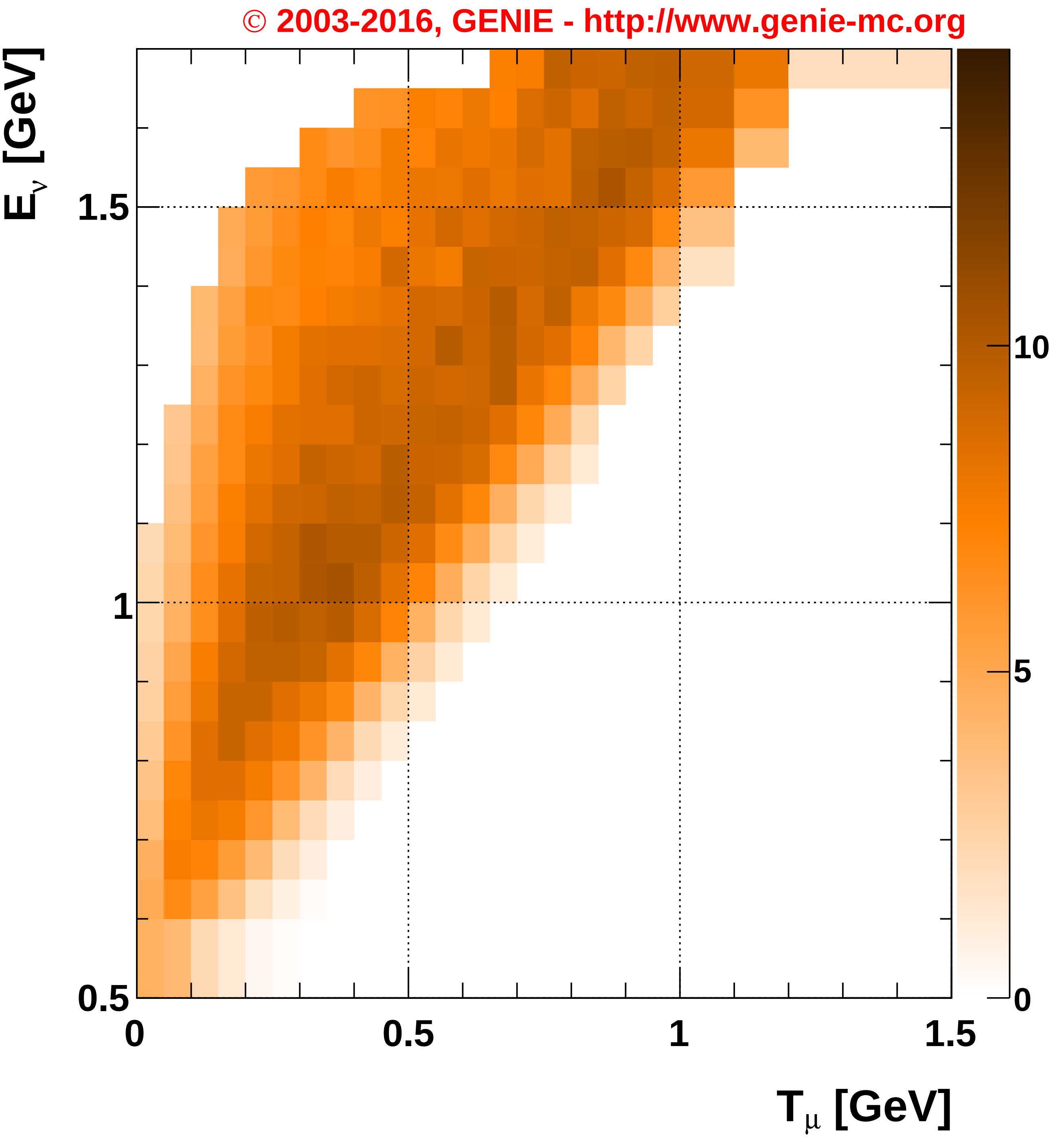
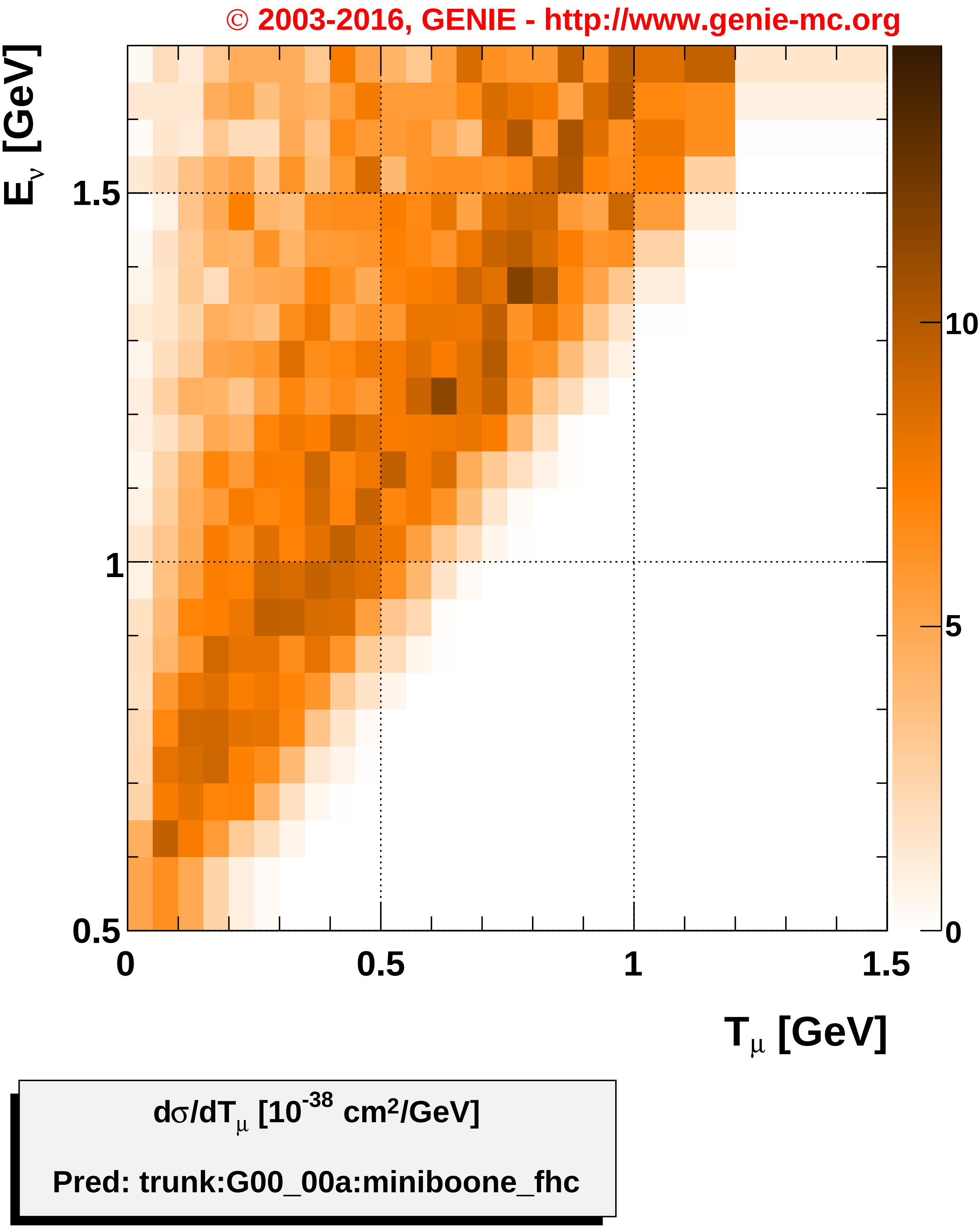
dσ/dT_μ [10^-38 cm^2/GeV]
T_μ [GeV]
0
2
4
0
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc χ^2 = 4.12/23 DoF
trunk:G00_00b:miniboone_fhc χ^2 = 3.83/23 DoF
trunk:G16_01a:miniboone_fhc χ^2 = 8.49/23 DoF
trunk:G16_02b:miniboone_fhc χ^2 = 7.48/23 DoF



$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]

Data: miniboone_nucc1pip_2011


© 2003-2016, GENIE - http://www.genie-mc.org
E_ν [GeV]
0.5
1
1.5
0
0.5
1
1.5
T_μ [GeV]
0
5
10
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
Pred: trunk:G00_00a:miniboone_fhc

miniboone_nucc1pip_2011

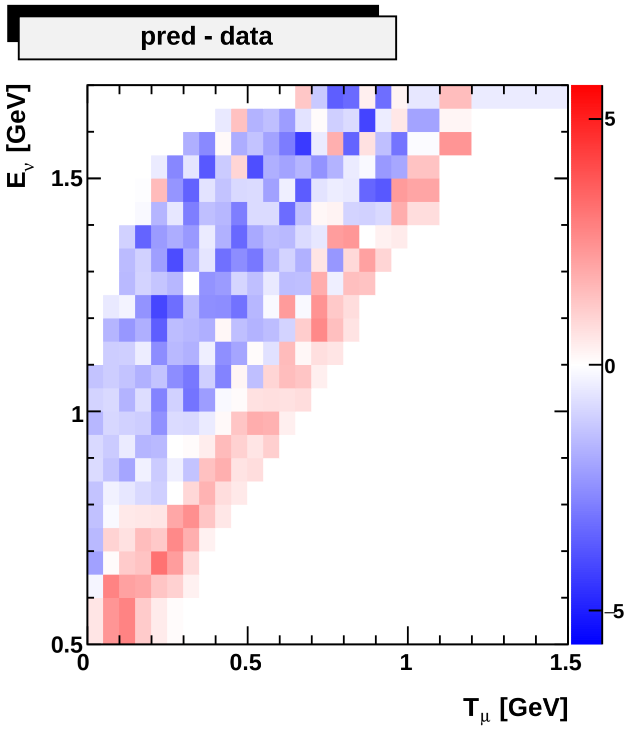
VS

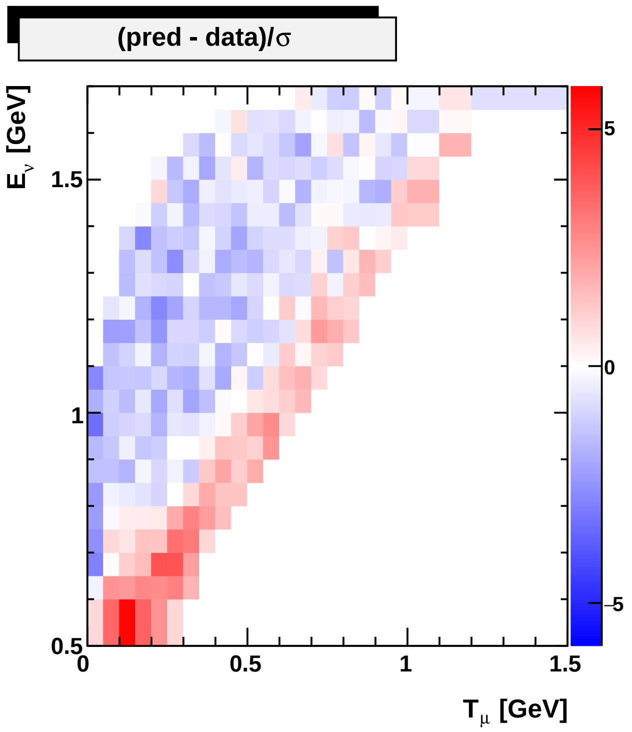
trunk:G00_00a:miniboone_fhc

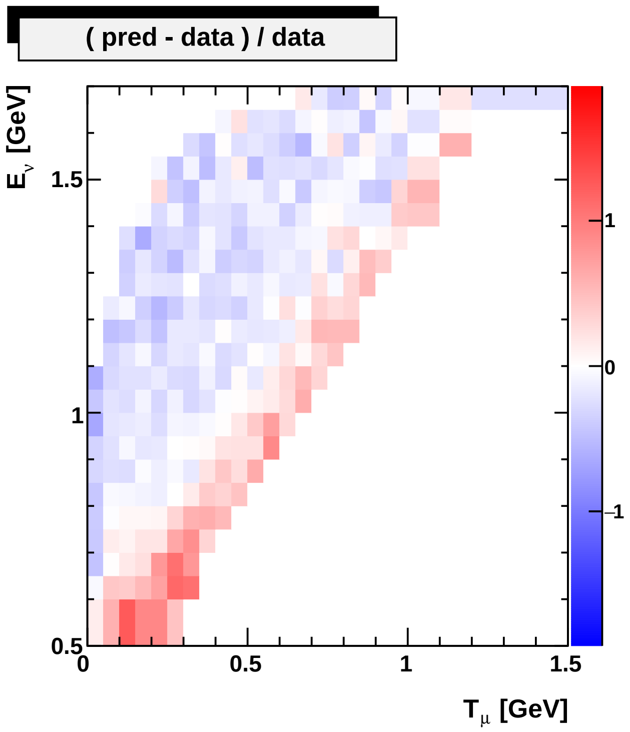
$d\sigma/dT_{\mu}$

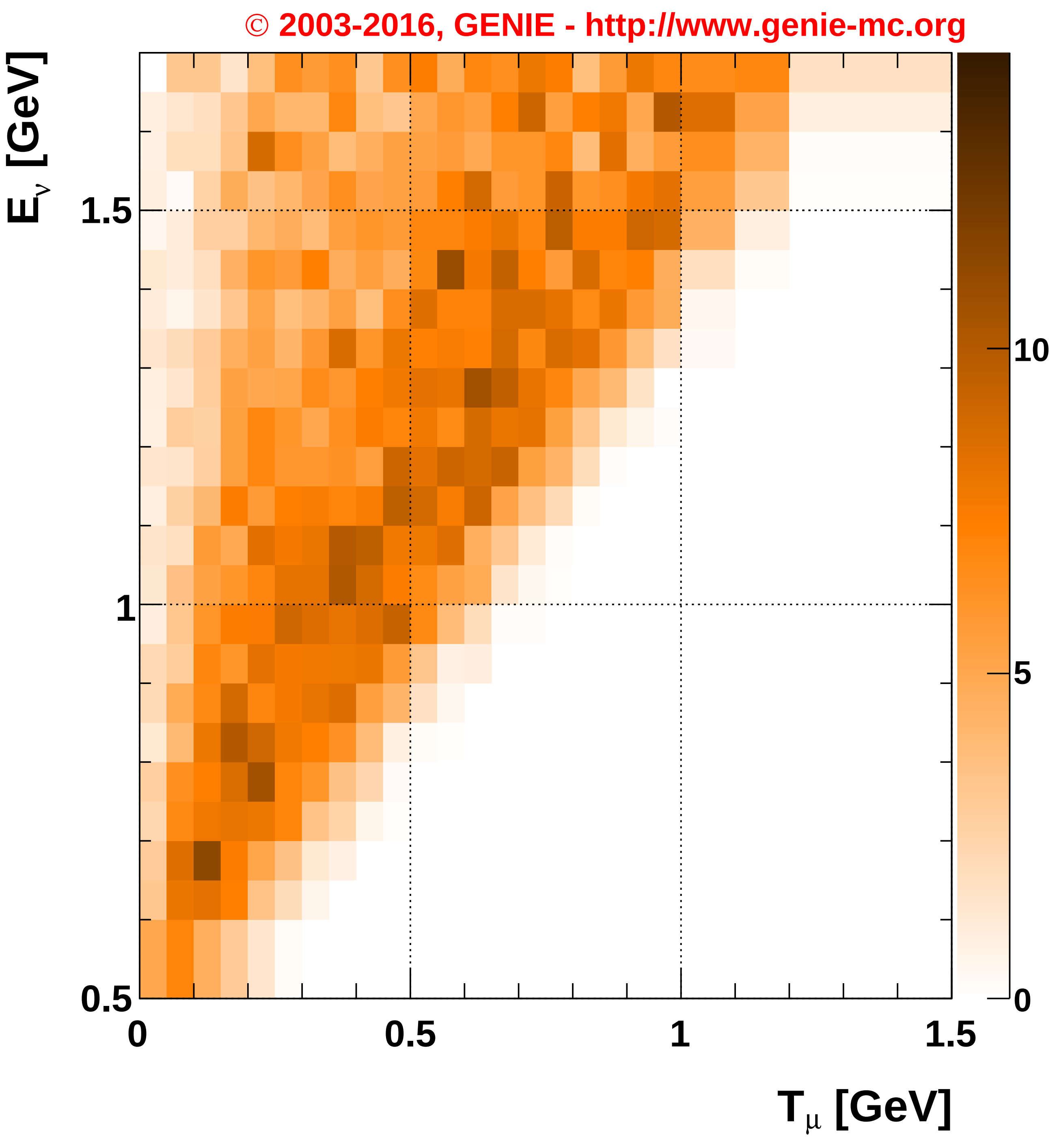
$[10^{-38}\ cm^2/GeV]$

χ^2 = 597.558/303 DoF









dσ/dT$_{\mu}$ [10^{-38} cm^2/GeV]

Pred: trunk:G00_00b:miniboone_fhc

miniboone_nucc1pip_2011

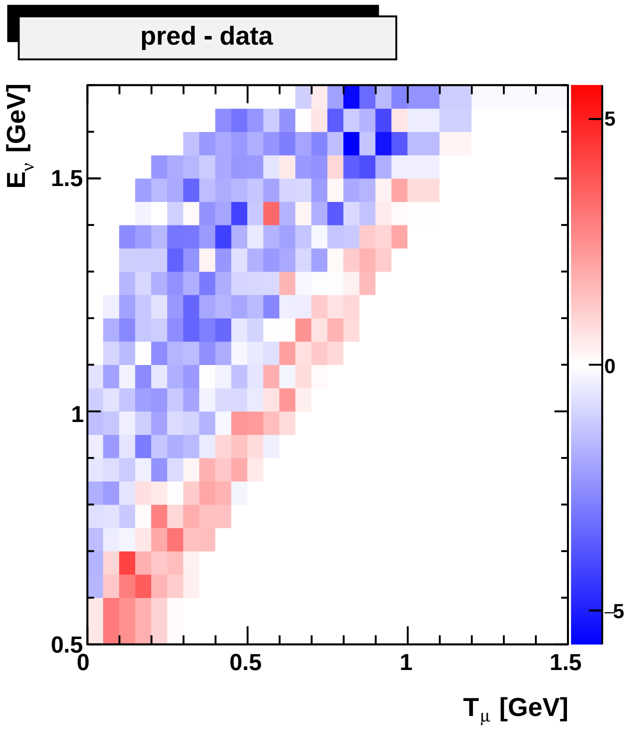
VS

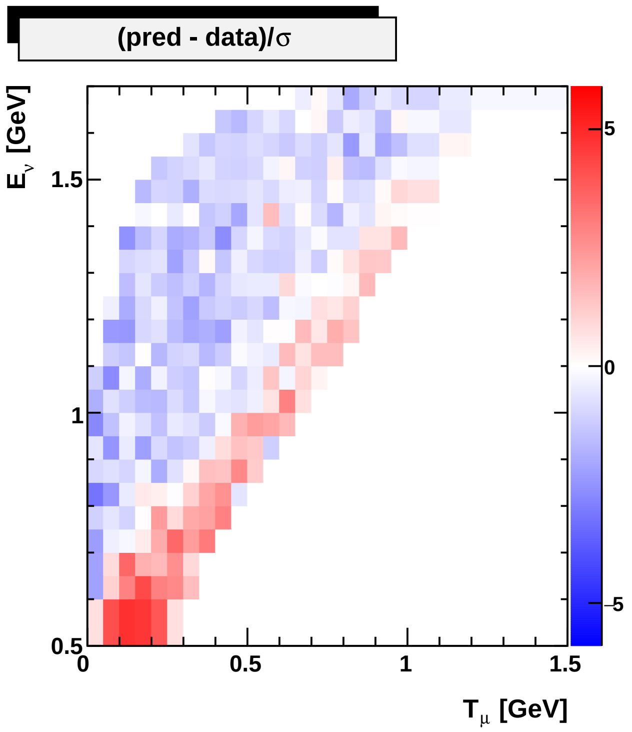
trunk:G00_00b:miniboone_fhc

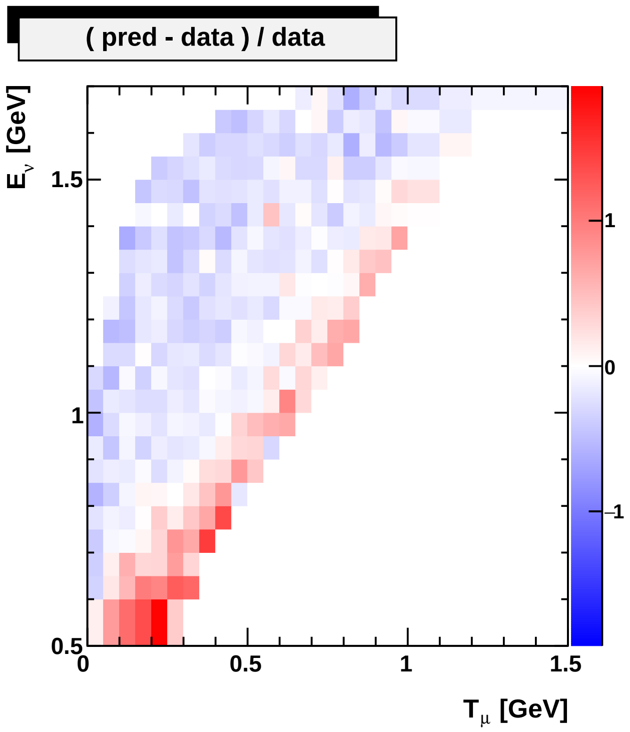
$d\sigma/dT_{\mu}$

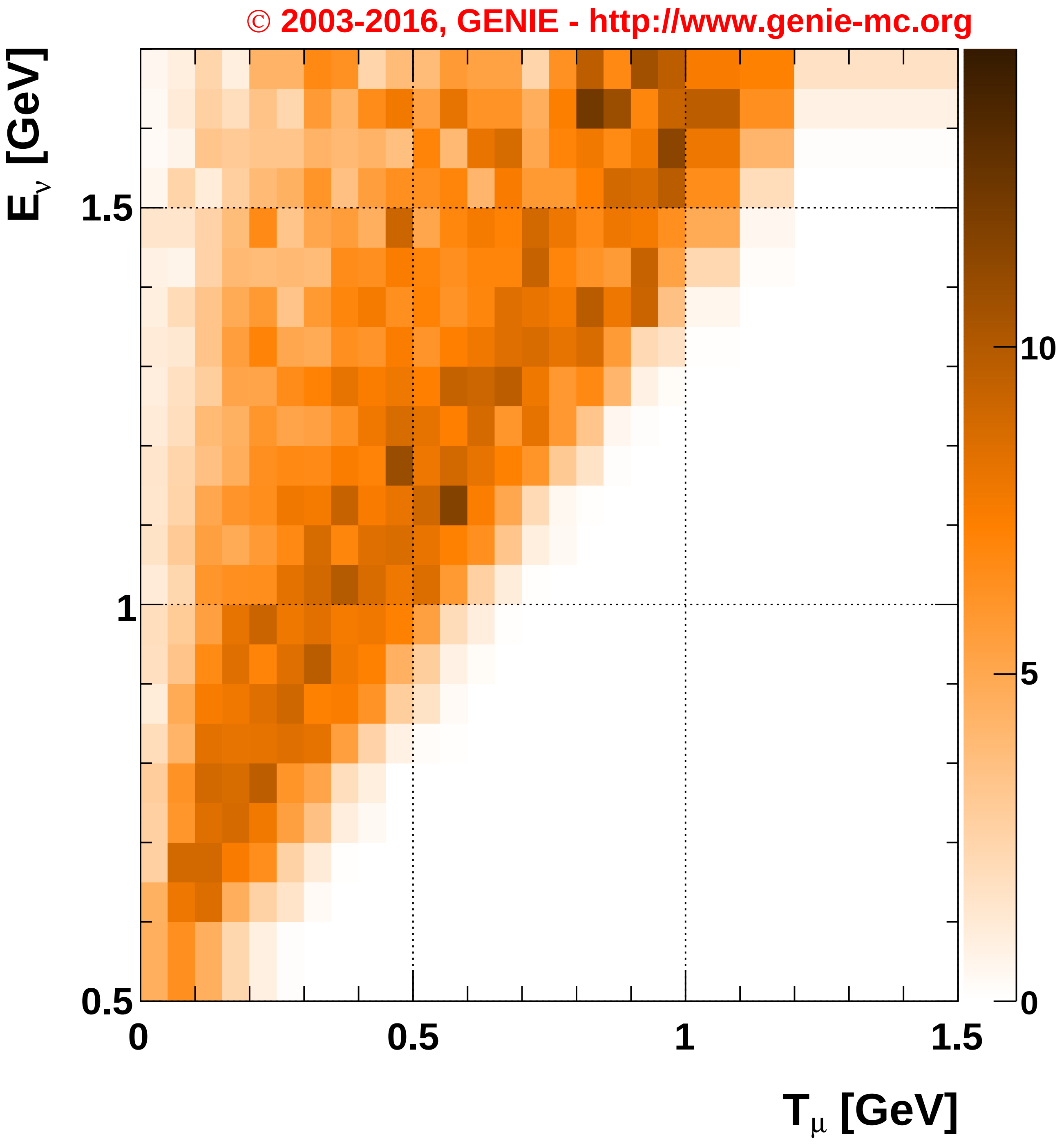
$[10^{-38}\ cm^2/GeV]$

χ^2 = 595.795/303 DoF









$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]

Pred: trunk:G16_01a:miniboone_fhc

miniboone_nucc1pip_2011

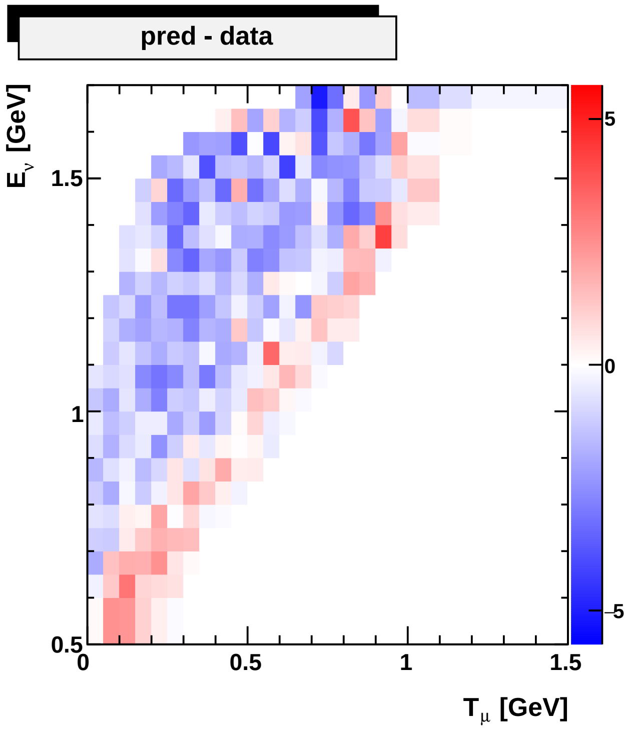
VS

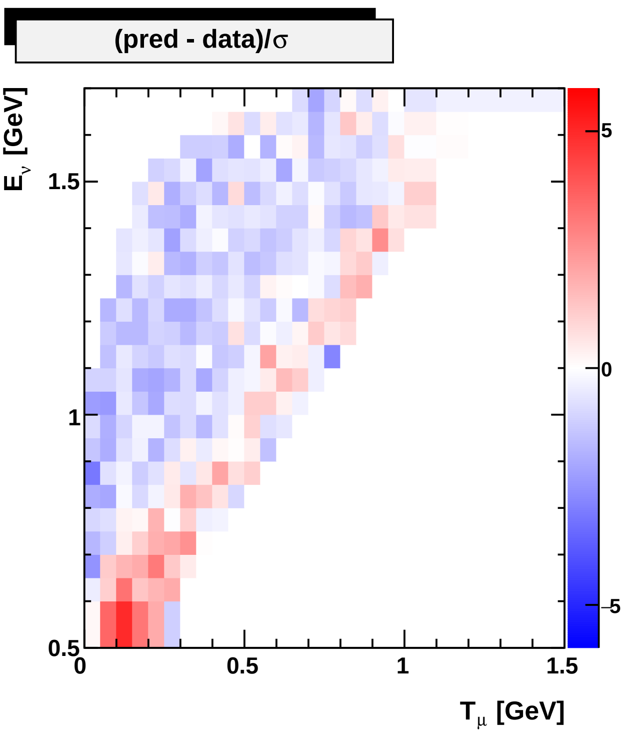
trunk:G16_01a:miniboone_fhc

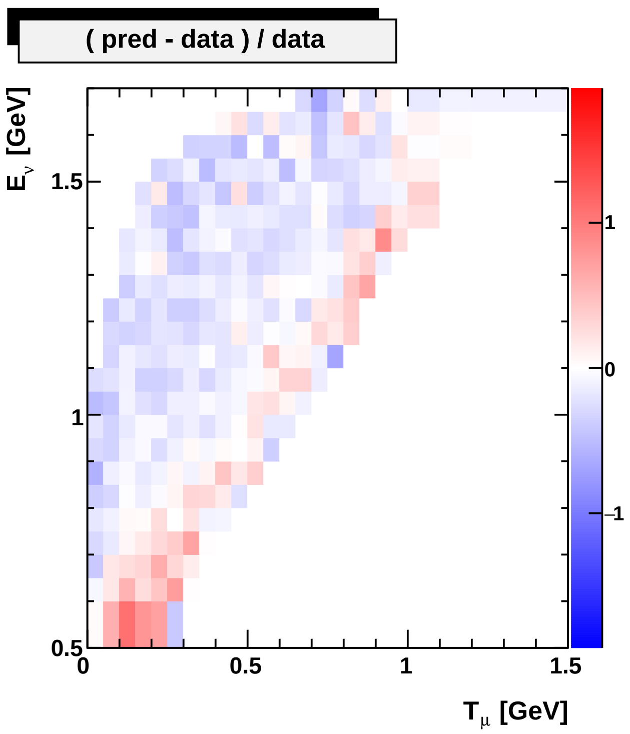
$d\sigma/dT_{\mu}$

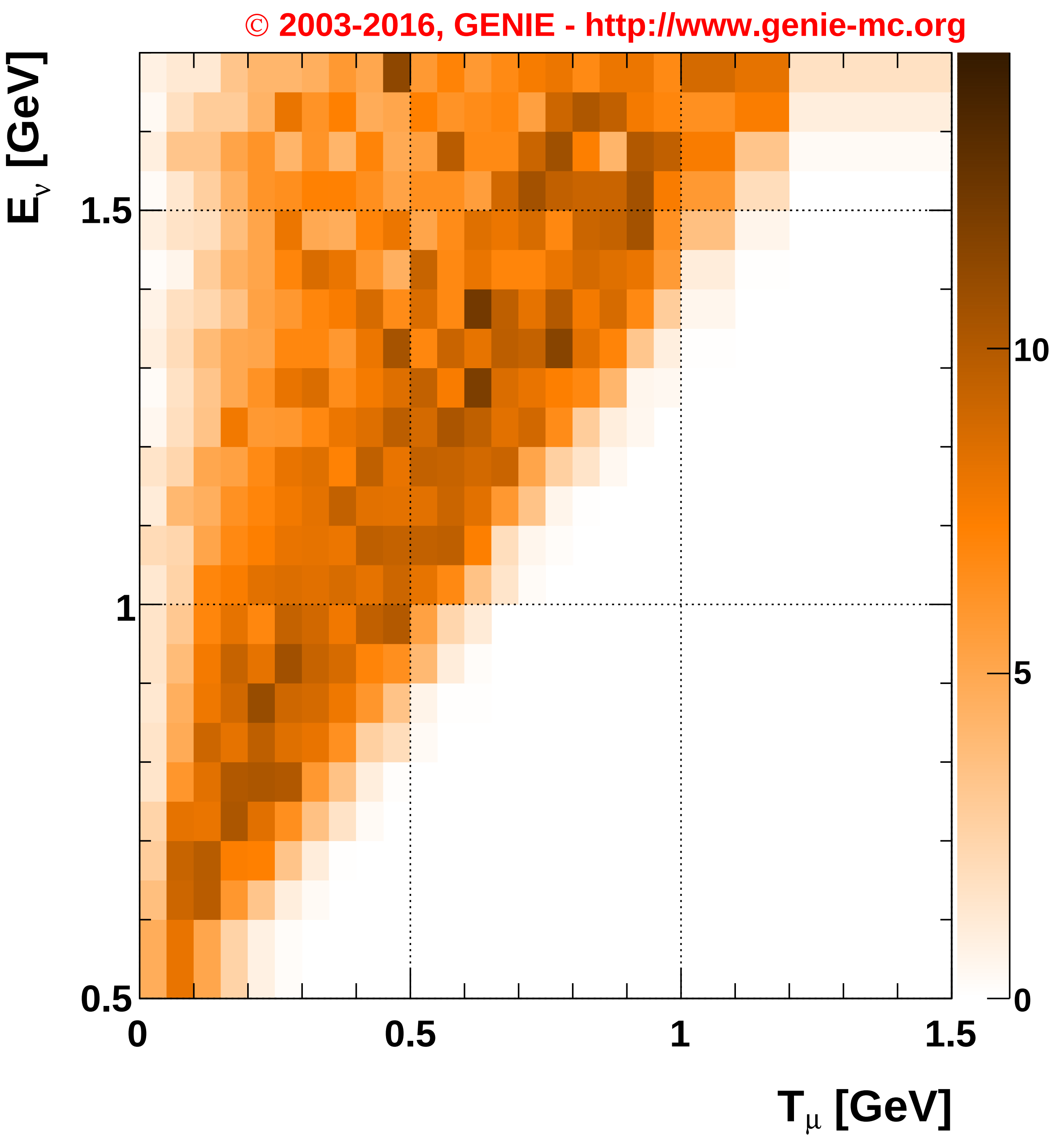
$[10^{-38}\ \mathrm{cm}^2/\mathrm{GeV}]$

χ^2 = 433.991/303 DoF









$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]

Pred: trunk:G16_02b:miniboone_fhc

miniboone_nucc1pip_2011

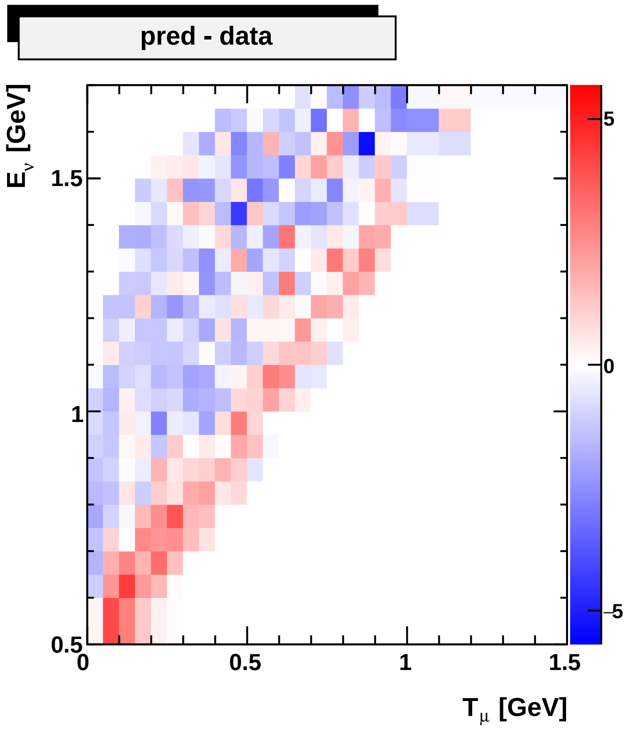
VS

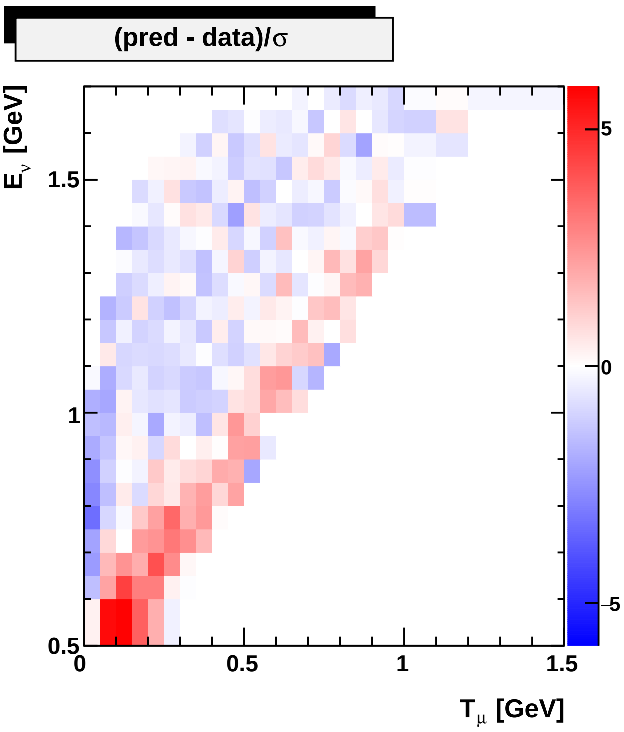
trunk:G16_02b:miniboone_fhc

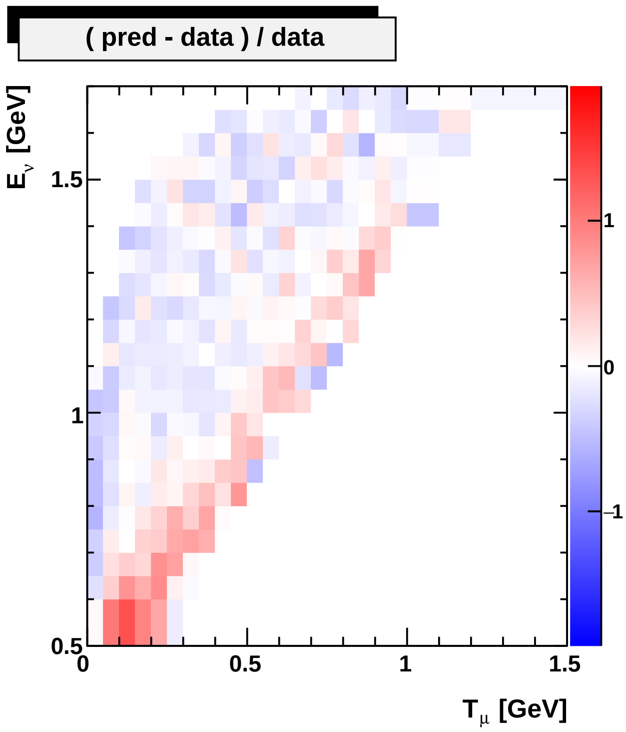
$d\sigma/dT_{\mu}$

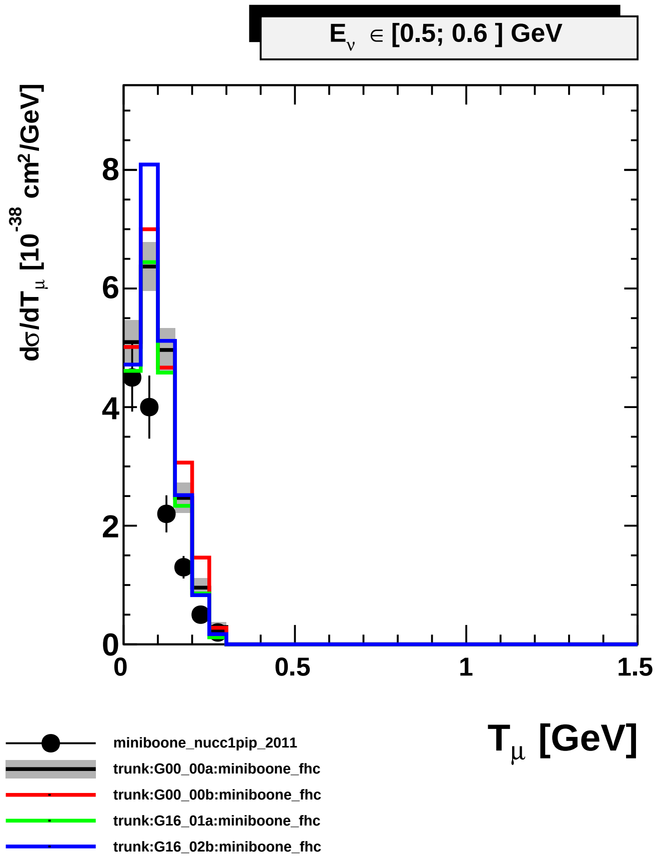
$[10^{-38}\ cm^2/GeV]$

χ^2 = 508.628/303 DoF

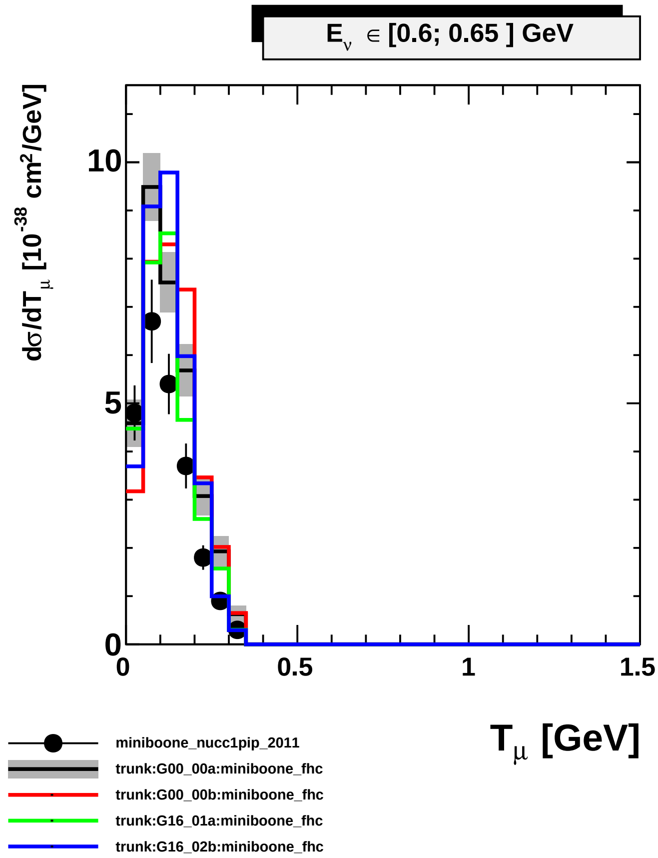




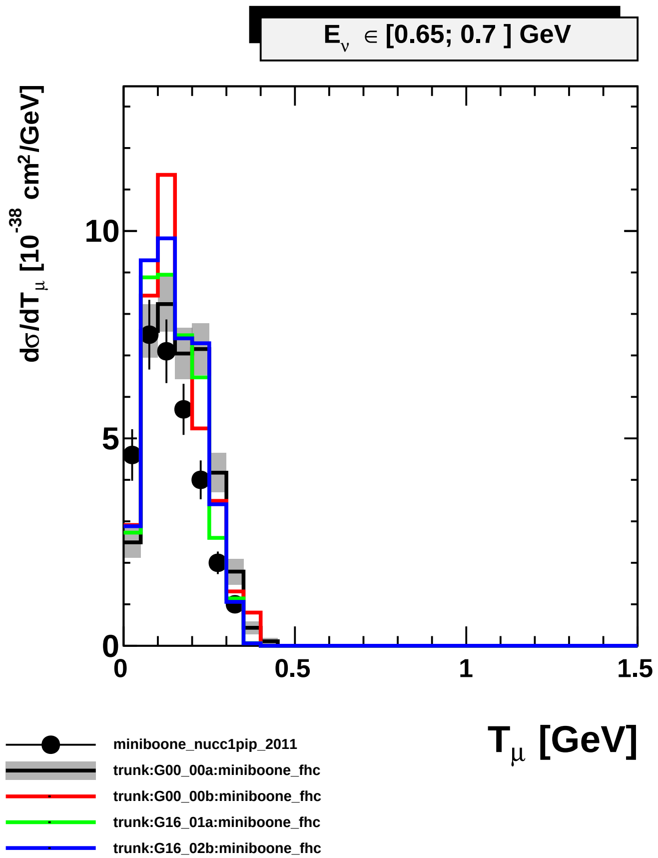




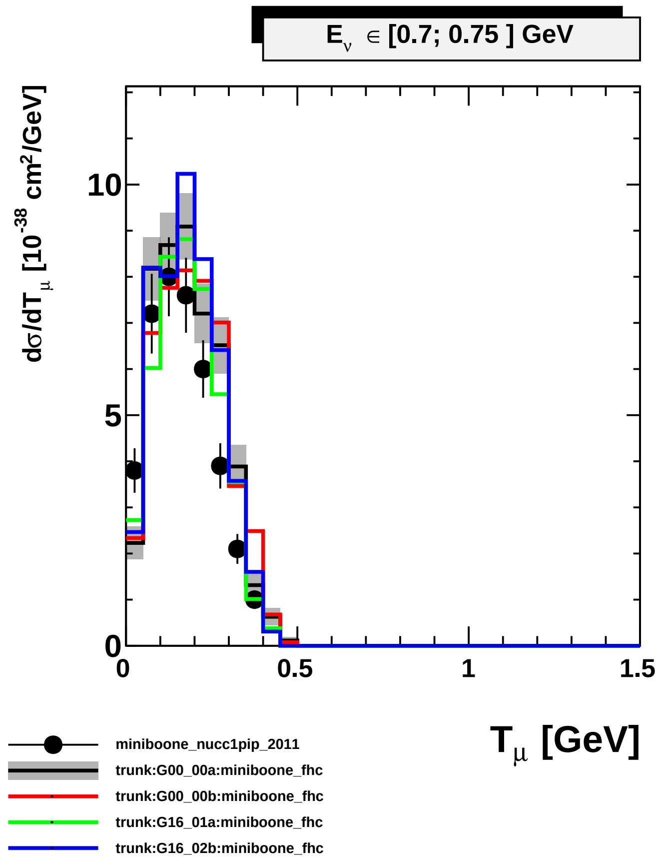
$E_\nu \in [0.5; 0.6]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



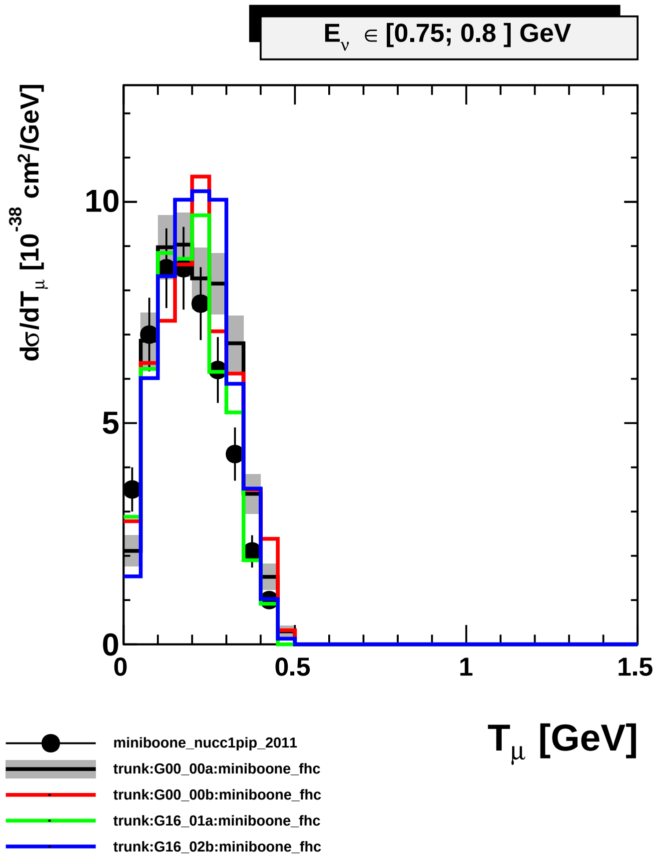
$E_\nu \in [0.6; 0.65]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

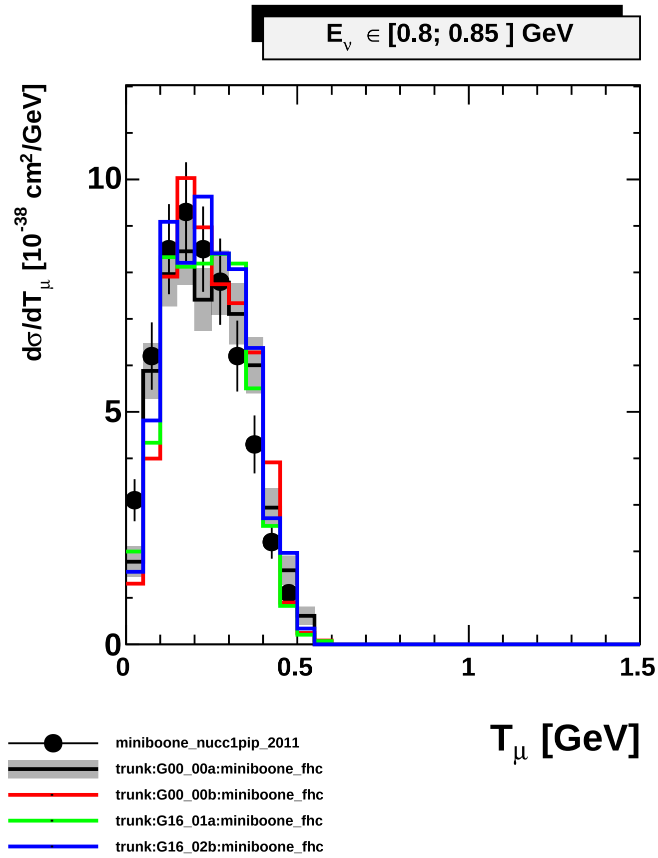


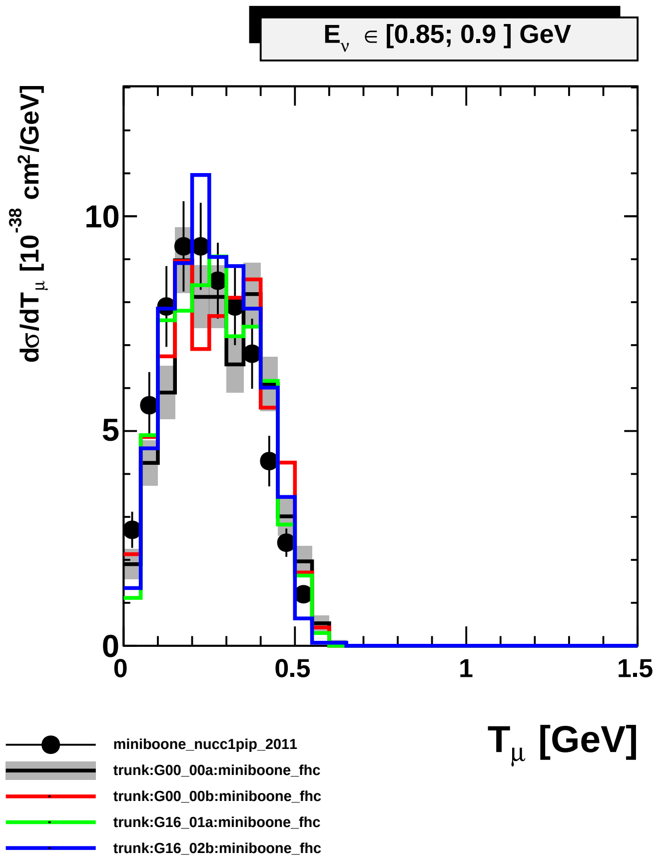
$E_\nu \in [0.65; 0.7]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

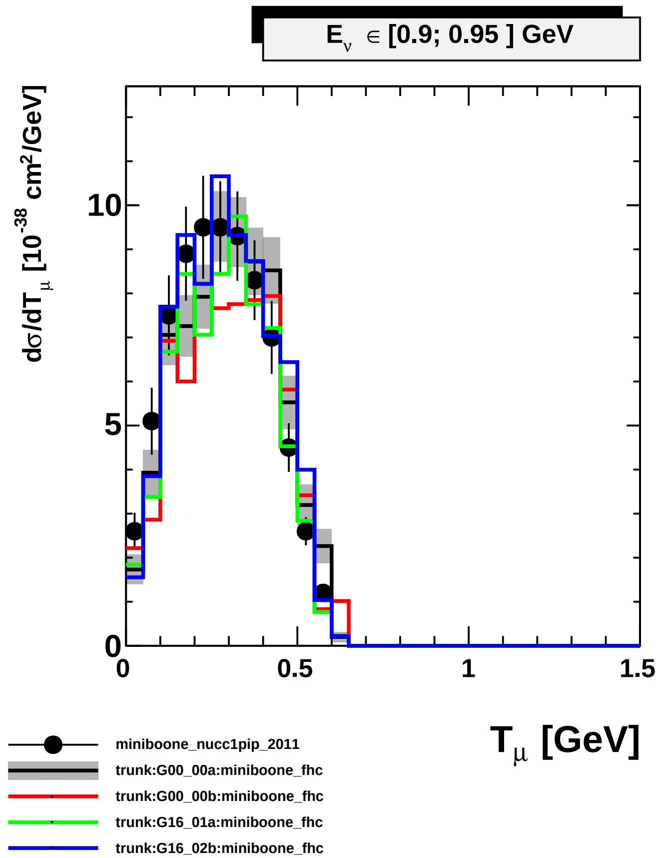


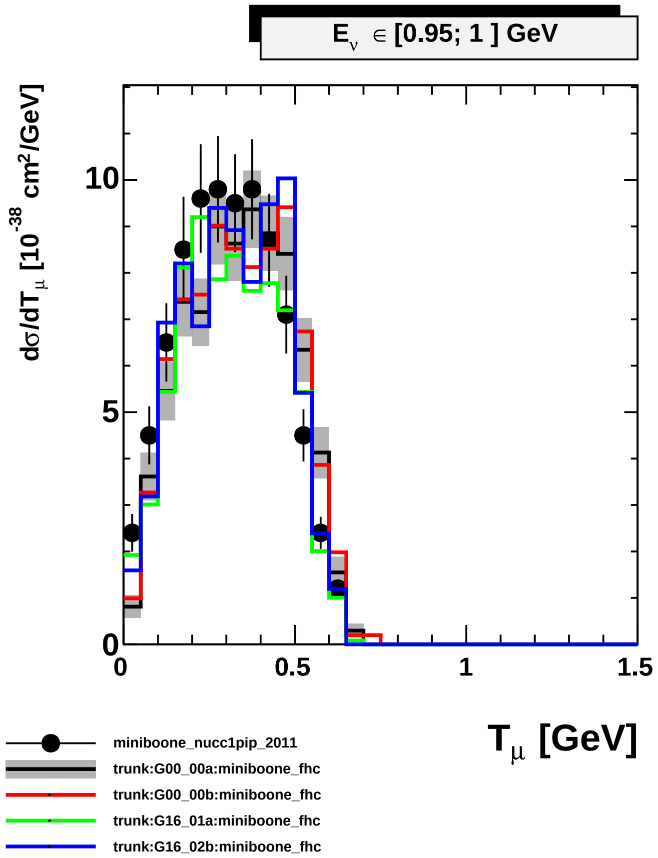
$E_\nu \in [0.7; 0.75]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$E_\nu \in [0.75; 0.8\ ]$ GeV
$d\sigma/dT_\mu\ [10^{-38}\ cm^2/GeV]$
0
5
10
0
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

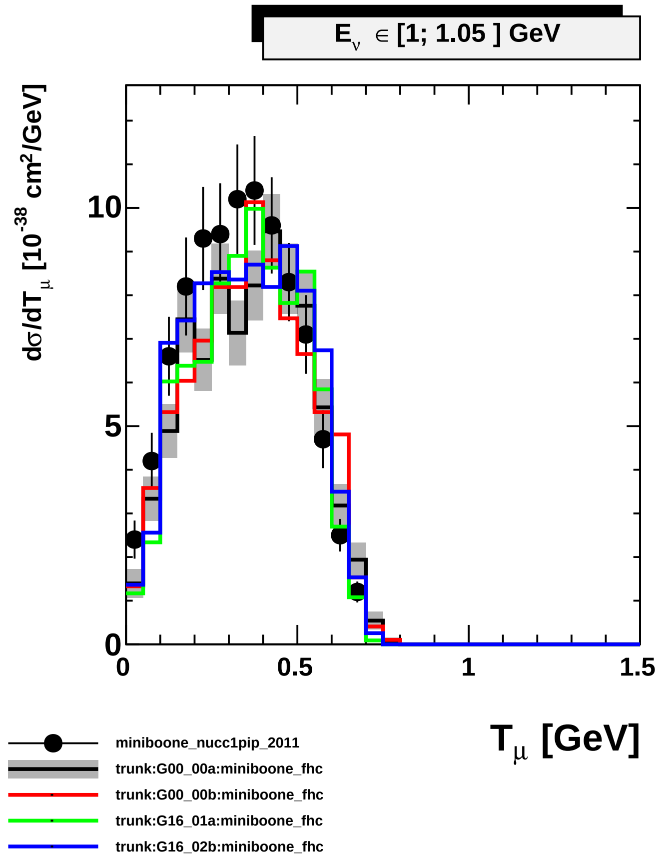

$E_\nu \in [0.8; 0.85\ ]$ GeV
$d\sigma/dT_\mu\ [10^{-38}\ cm^2/GeV]$
0
5
10
0
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$E_\nu \in [0.85; 0.9\ ]$ GeV
$d\sigma/dT_\mu\ [10^{-38}\ cm^2/GeV]$
0
5
10
0
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

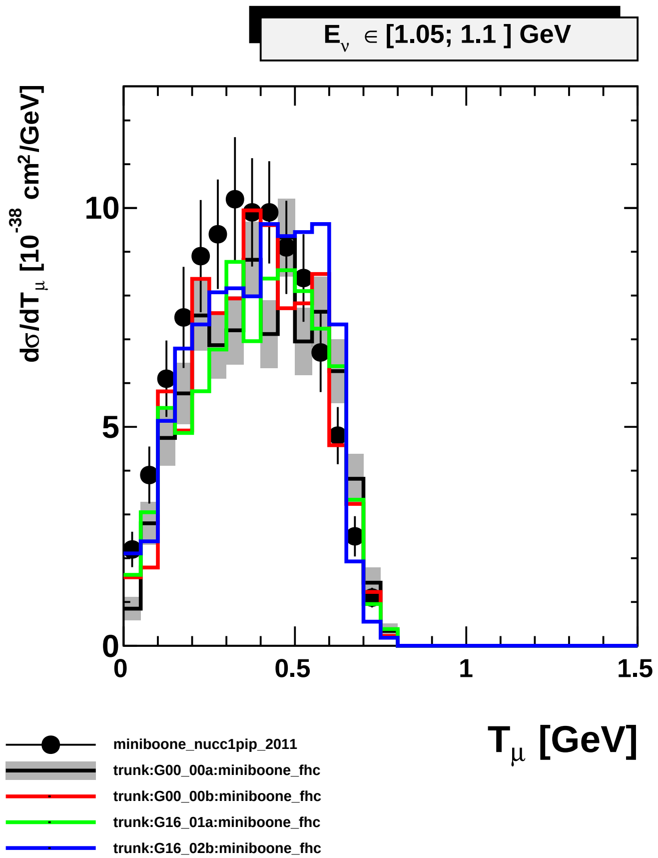

$E_\nu \in [0.9; 0.95\ ]$ GeV
$d\sigma/dT_\mu\ [10^{-38}\ cm^2/GeV]$
0
5
10
0
0.5
1
1.5
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



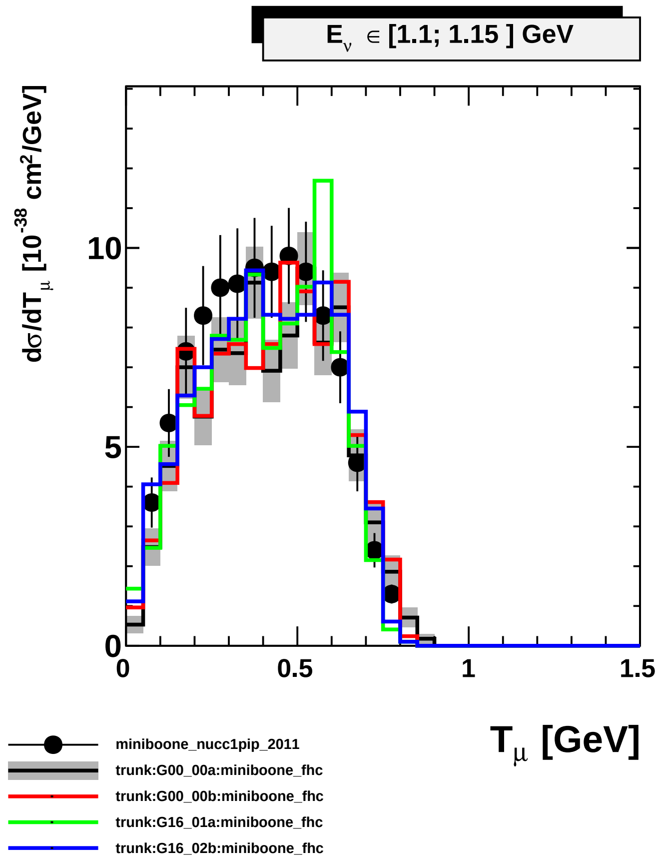
E_ν ∈ [0.95; 1] GeV
dσ/dT_μ [10^-38 cm^2/GeV]
T_μ [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



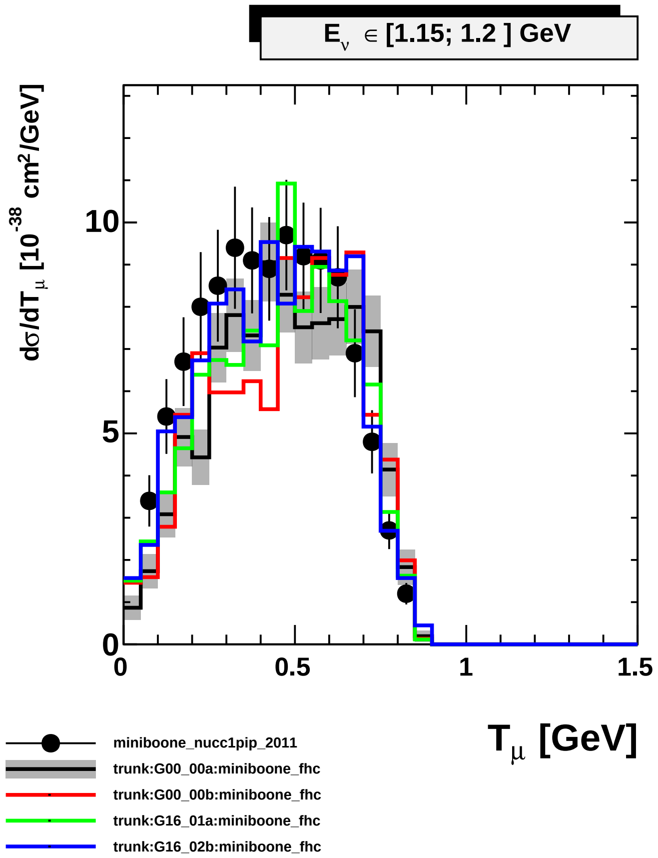
E_ν ∈ [1; 1.05] GeV
dσ/dT_μ [10^-38 cm^2/GeV]
T_μ [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

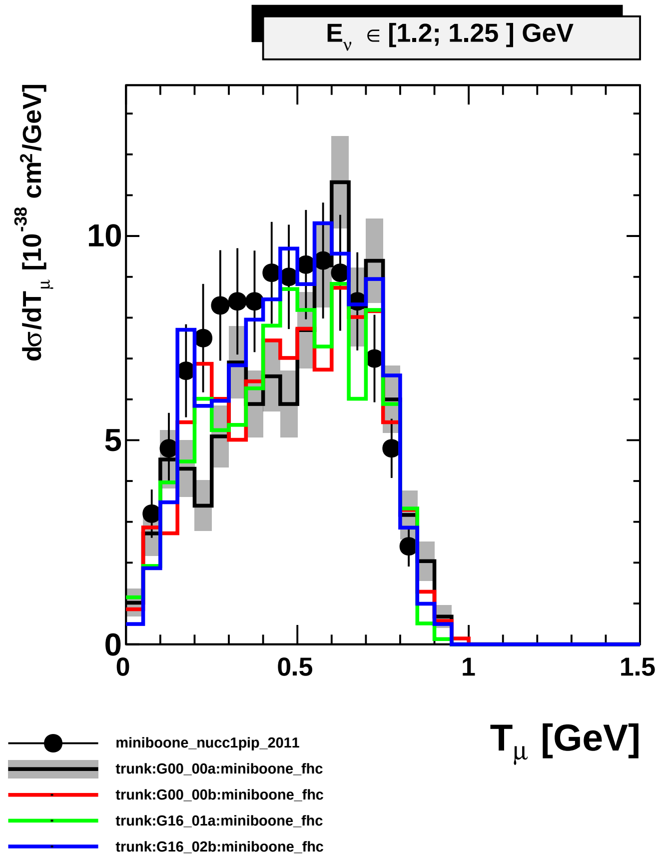


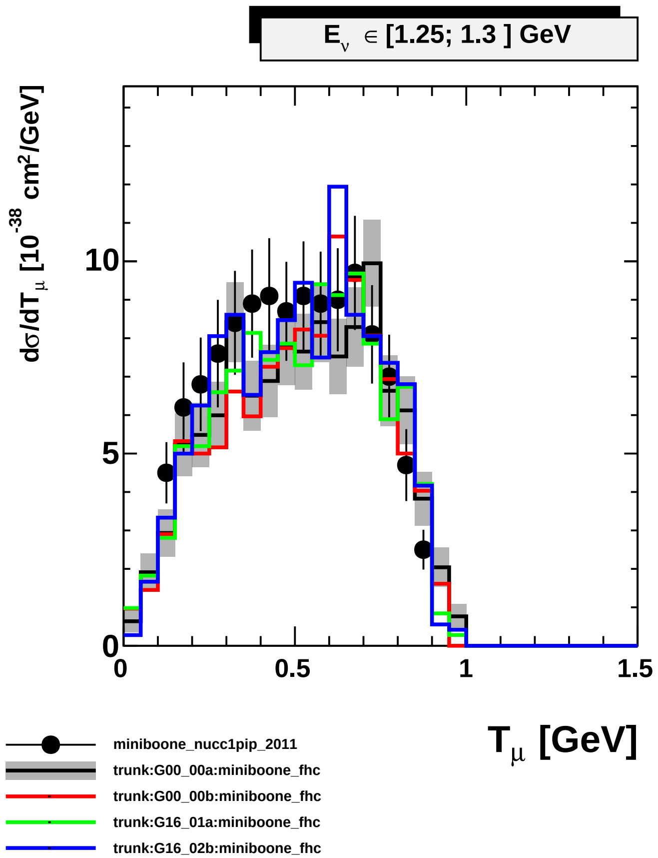
E_ν ∈ [1.05; 1.1] GeV
dσ/dT_μ [10^-38 cm^2/GeV]
T_μ [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

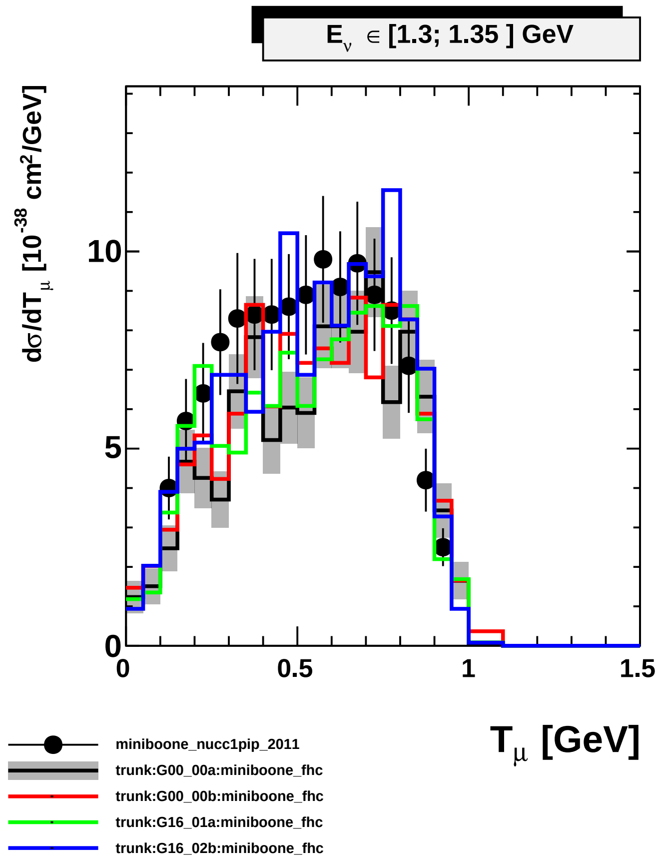


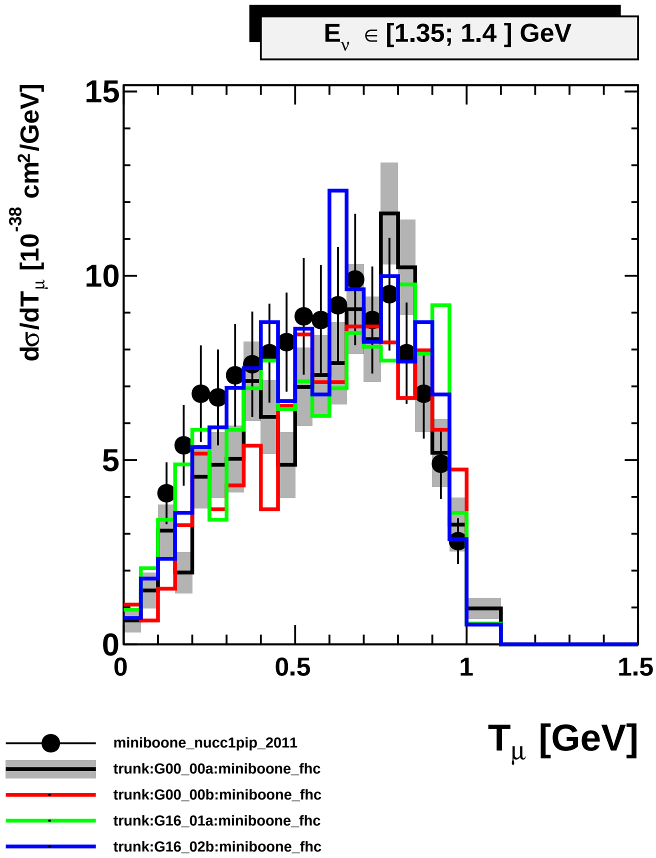
E_ν ∈ [1.1; 1.15] GeV
dσ/dT_μ [10^-38 cm^2/GeV]
T_μ [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$E_\nu \in$ [1.15; 1.2] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

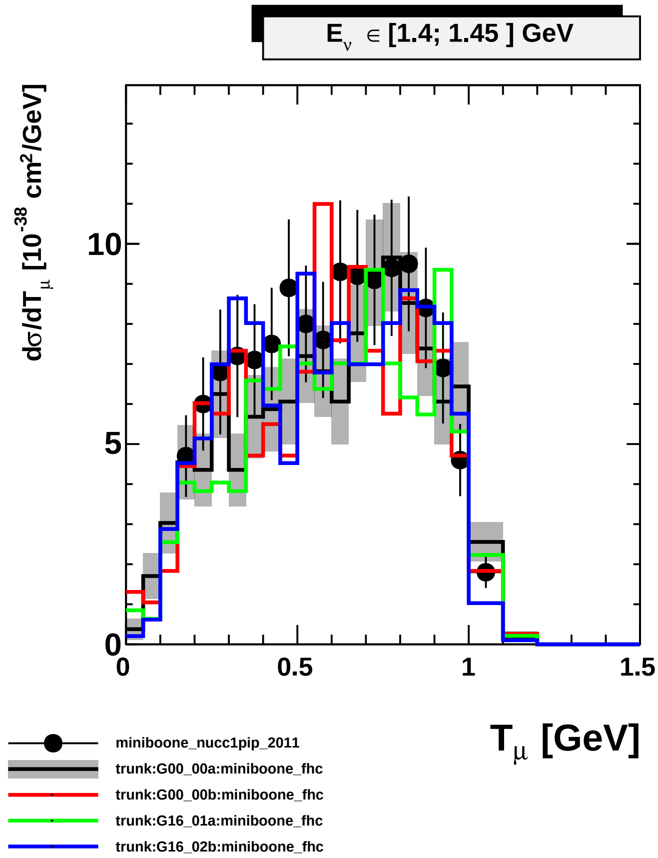

$E_\nu \in$ [1.2; 1.25] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$E_\nu \in$ [1.25; 1.3] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

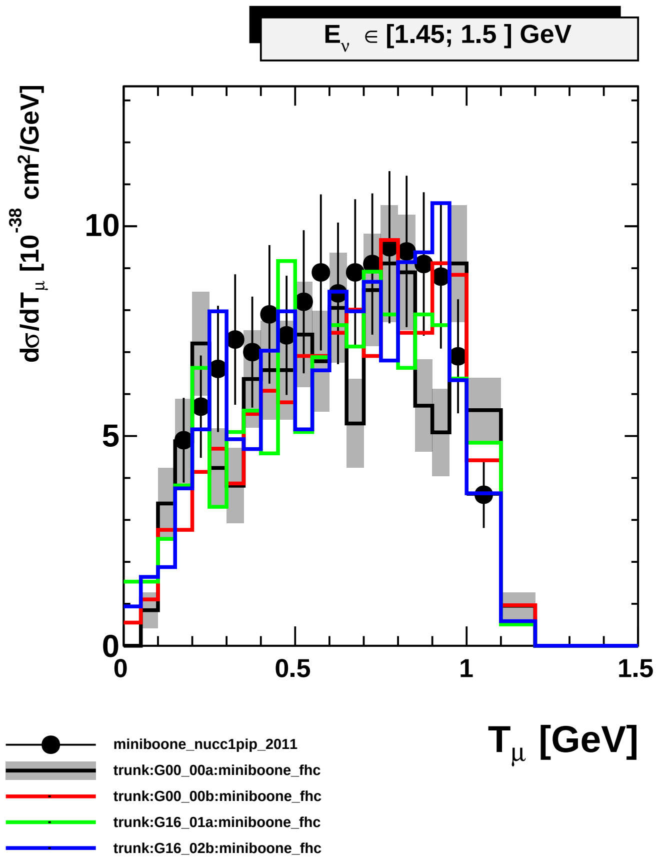

$E_\nu \in$ [1.3; 1.35] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



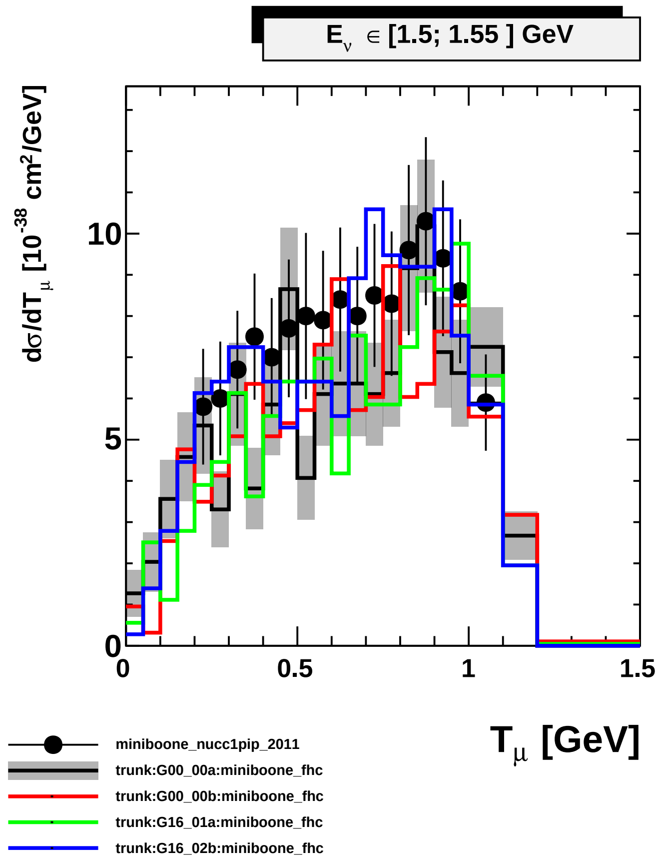
$E_\nu \in$ [1.35; 1.4] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



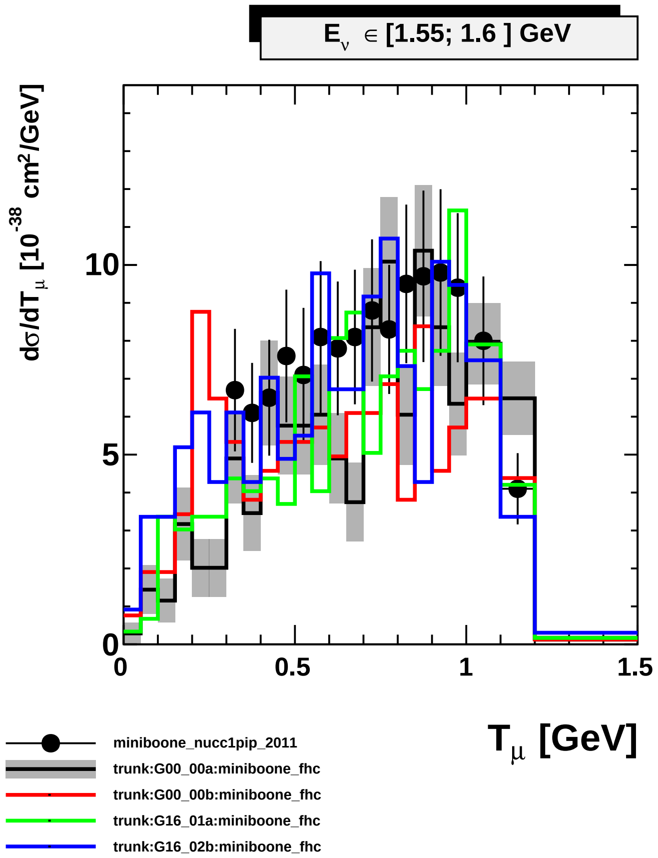
$E_\nu \in$ [1.4; 1.45] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



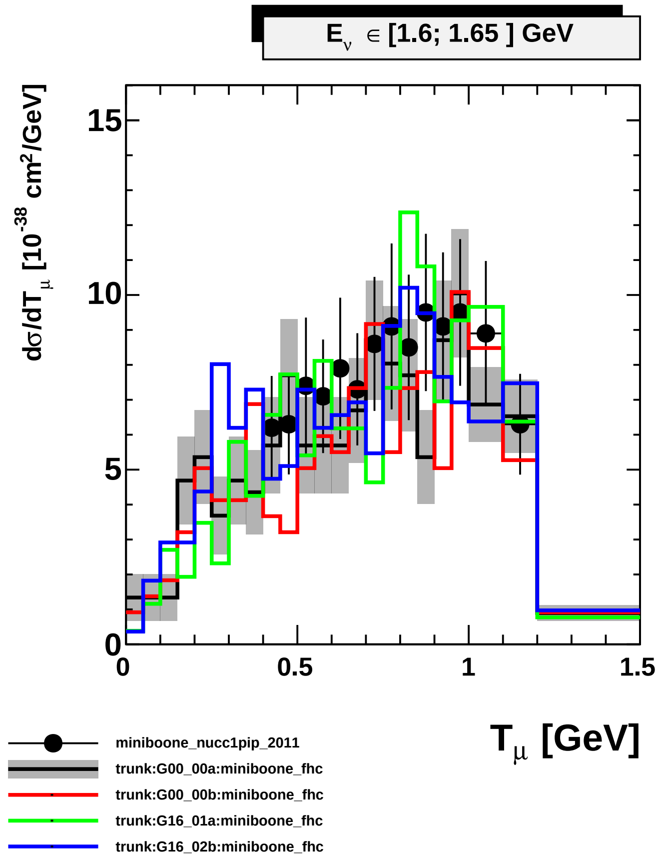
$E_\nu \in$ [1.45; 1.5] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



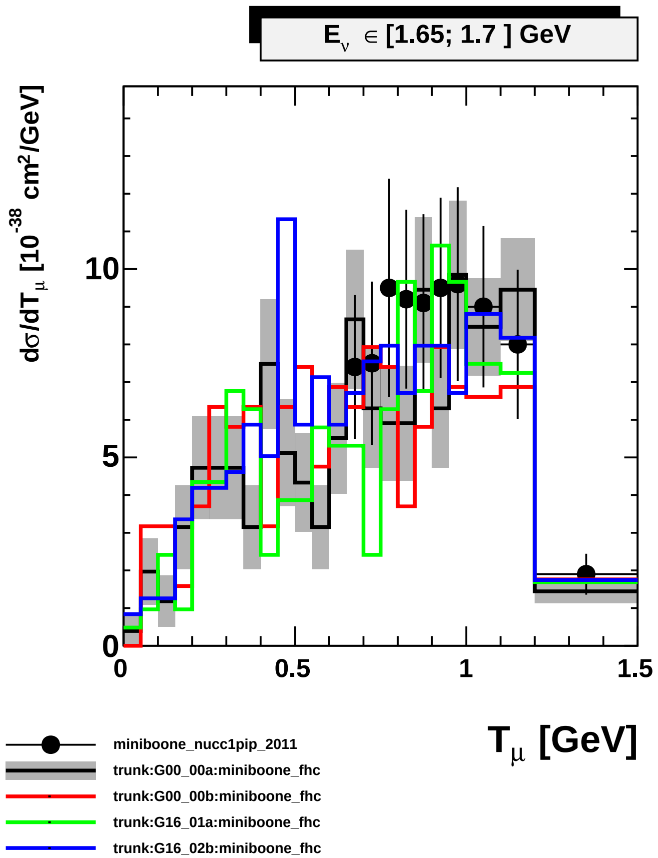
$E_\nu \in$ [1.5; 1.55] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



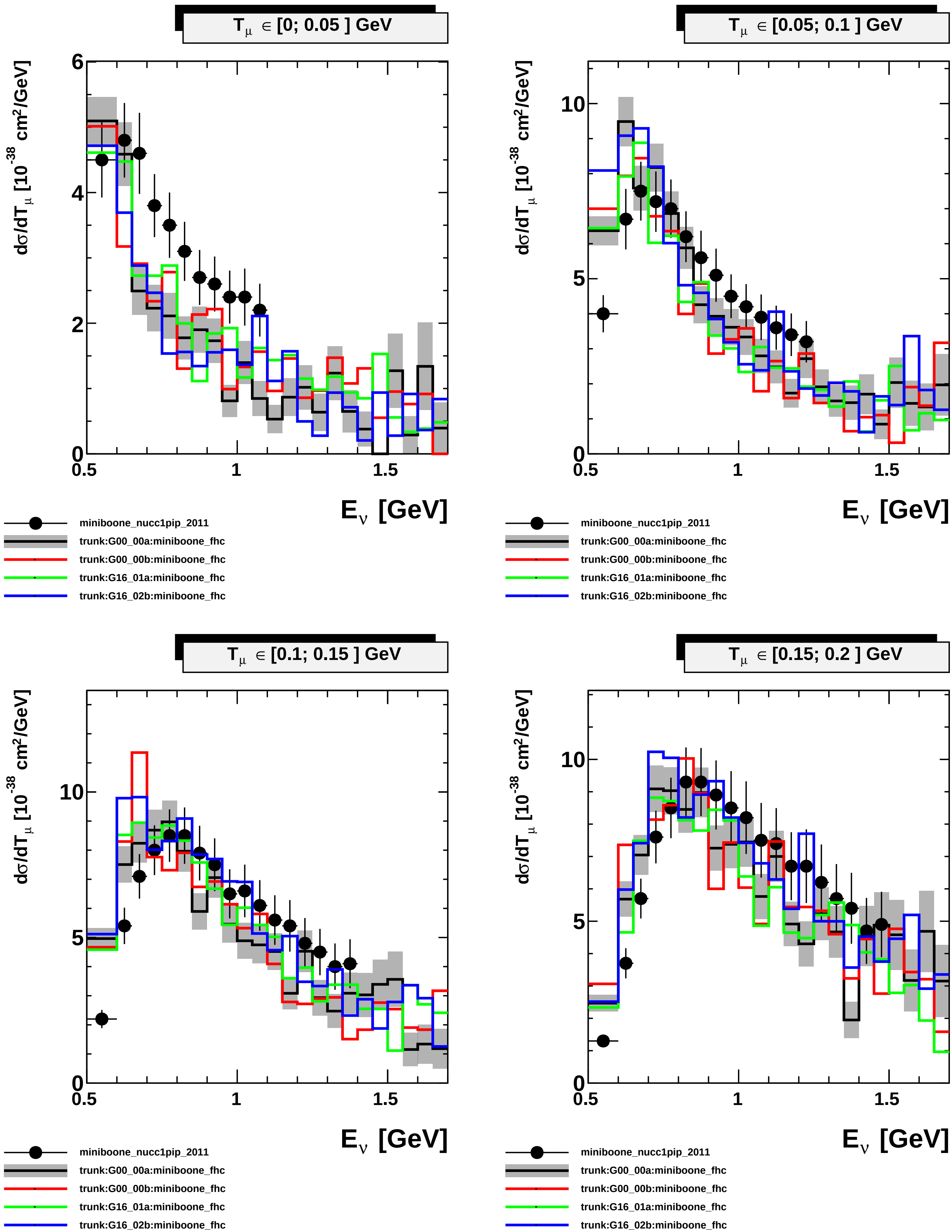
$E_\nu \in$ [1.55; 1.6] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



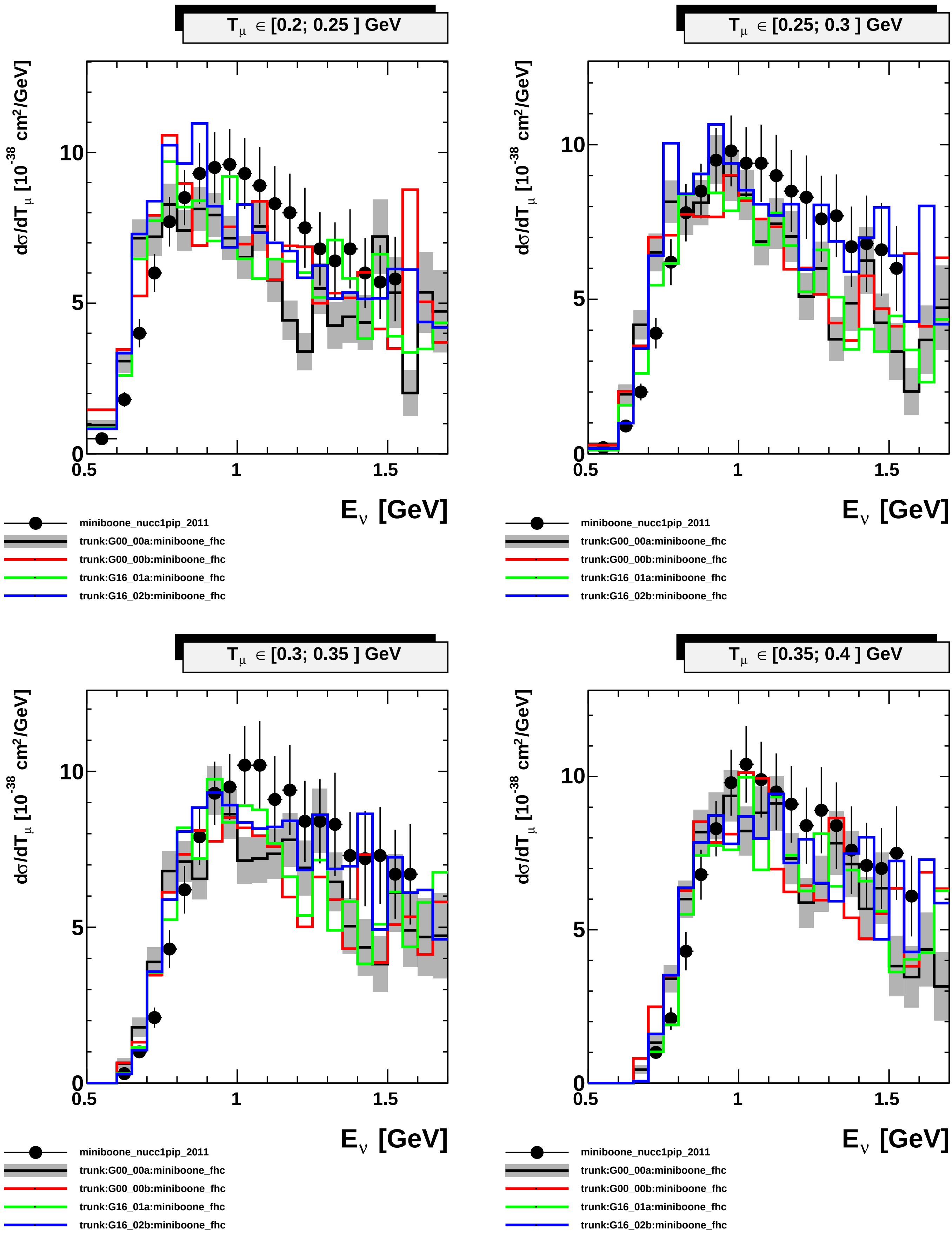
$E_\nu \in$ [1.6; 1.65] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
0
5
10
15
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



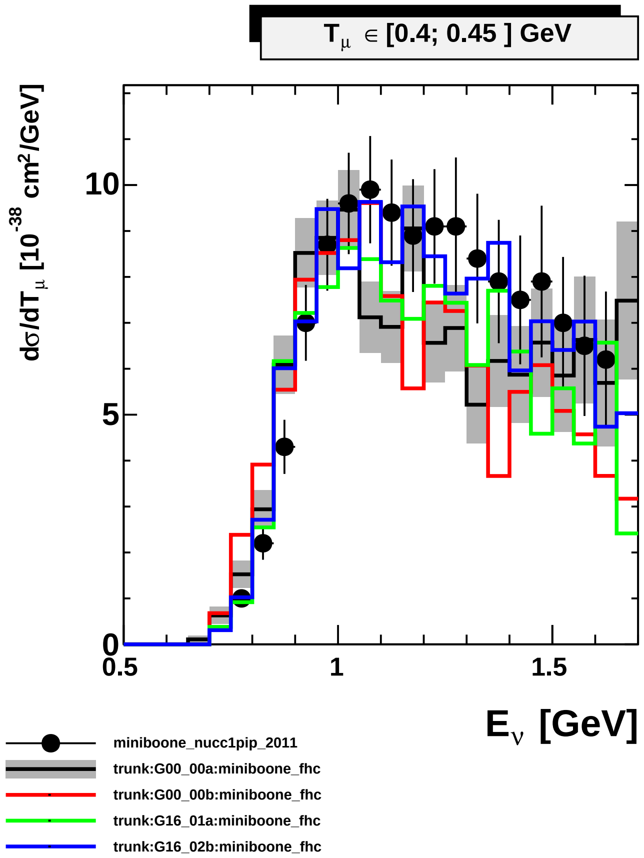
$E_\nu \in$ [1.65; 1.7] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
T_μ [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



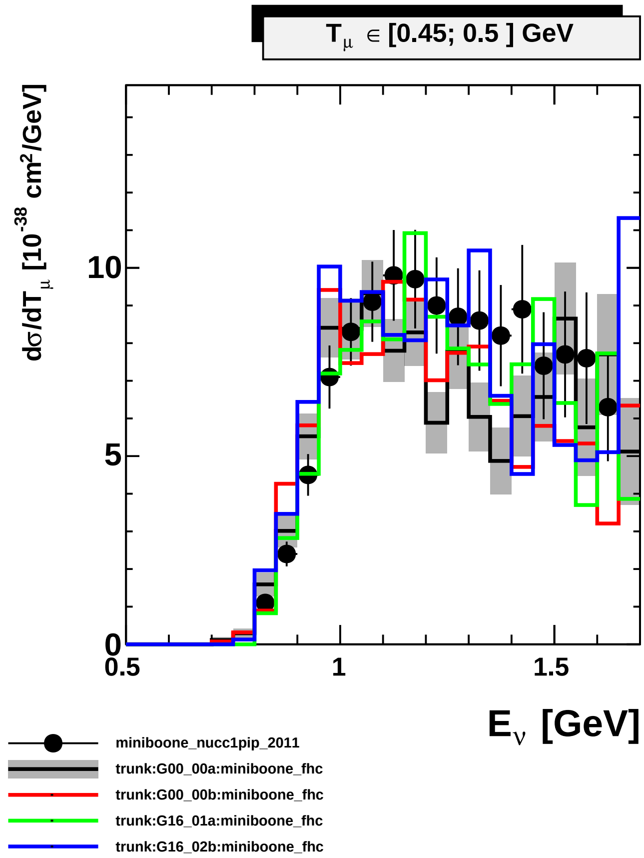
$T_\mu \in [0; 0.05]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc
$T_\mu \in [0.05; 0.1]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc
$T_\mu \in [0.1; 0.15]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc
$T_\mu \in [0.15; 0.2]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



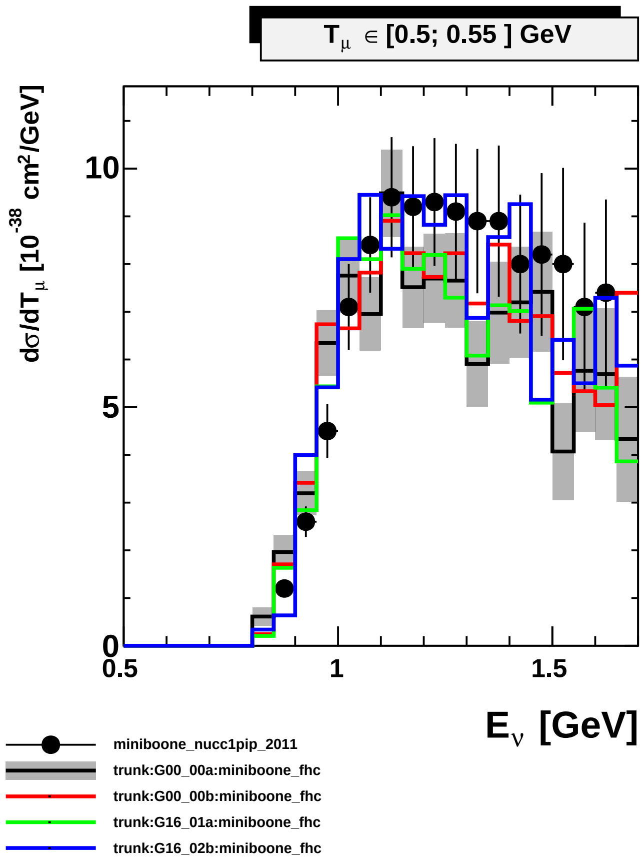
T_μ ∈ [0.2; 0.25] GeV
T_μ ∈ [0.25; 0.3] GeV
T_μ ∈ [0.3; 0.35] GeV
T_μ ∈ [0.35; 0.4] GeV
dσ/dT_μ [10^-38 cm^2/GeV]
E_ν [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



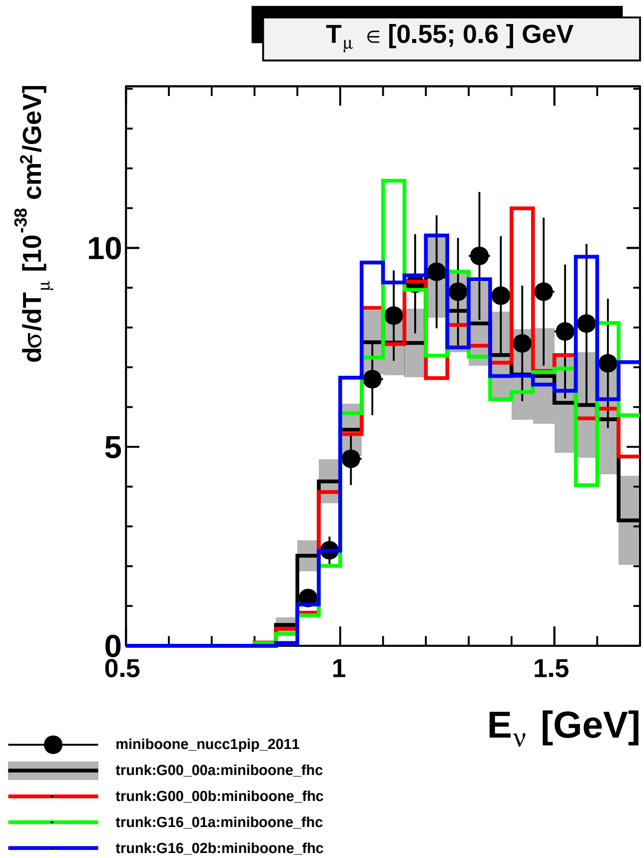
$T_\mu \in [0.4; 0.45]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



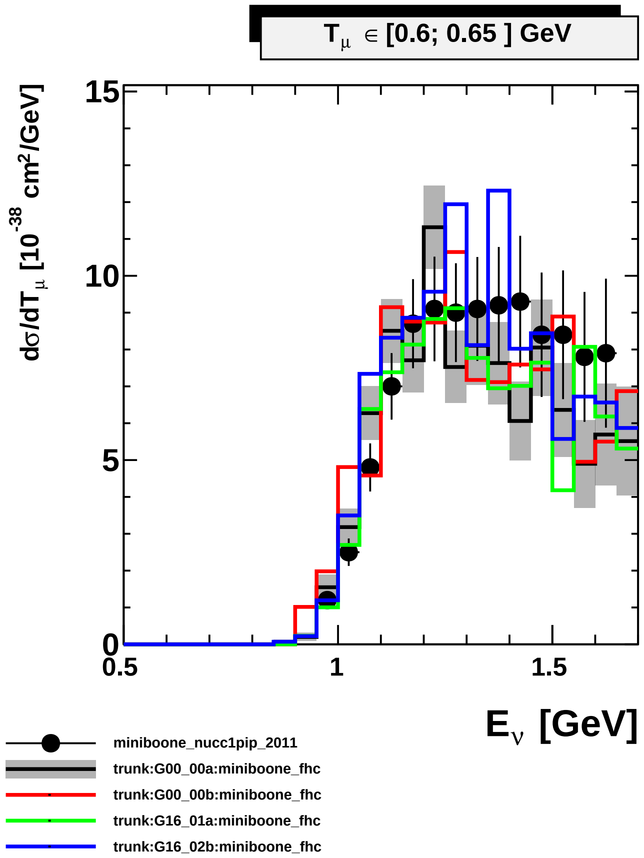
$T_\mu \in [0.45; 0.5]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



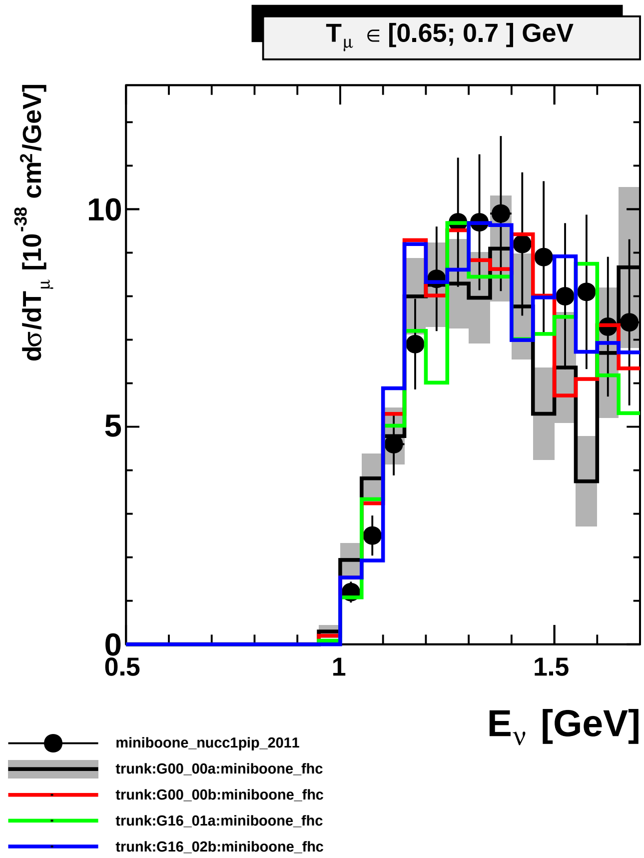
$T_\mu \in [0.5; 0.55]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



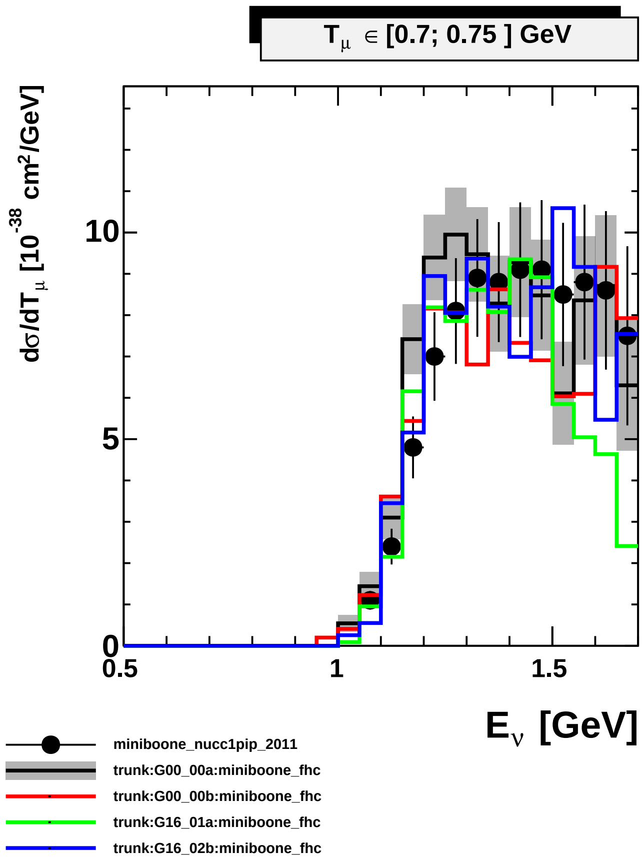
$T_\mu \in [0.55; 0.6]$ GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
0
5
10
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



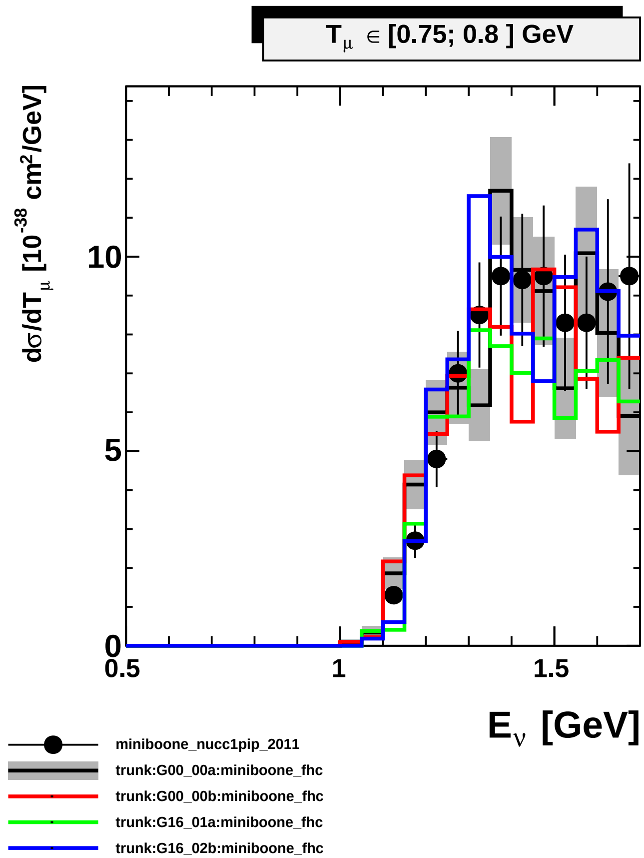
$T_\mu \in$ [0.6; 0.65] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



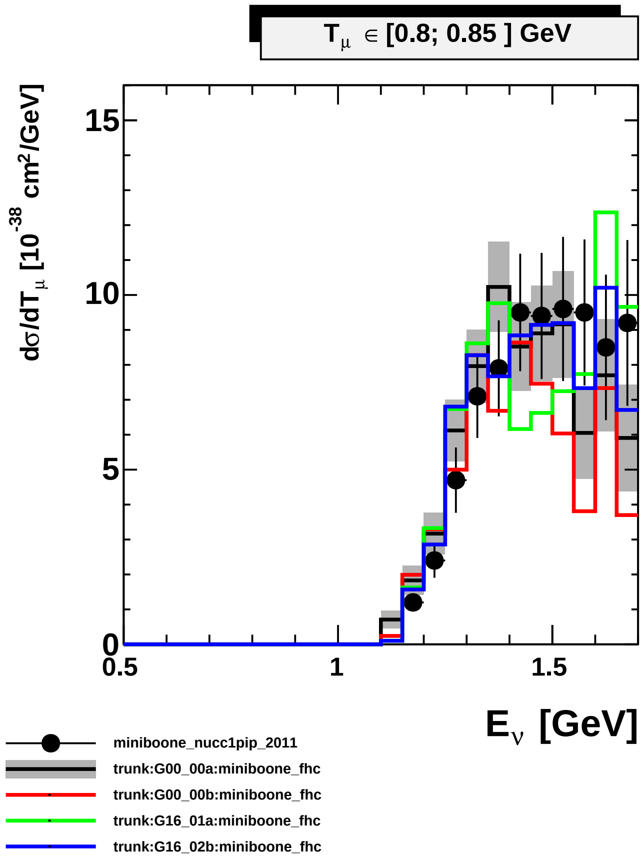
$T_\mu \in$ [0.65; 0.7] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

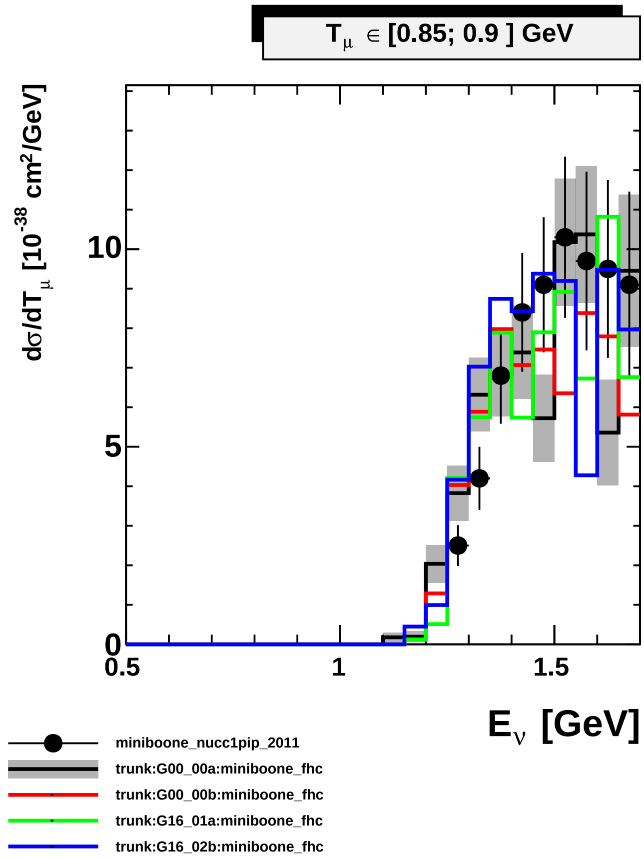


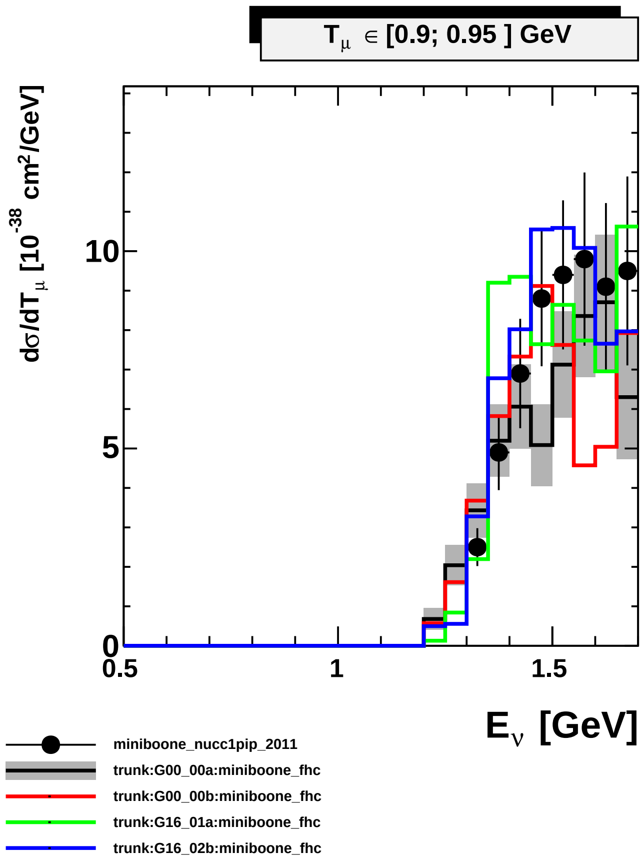
$T_\mu \in$ [0.7; 0.75] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

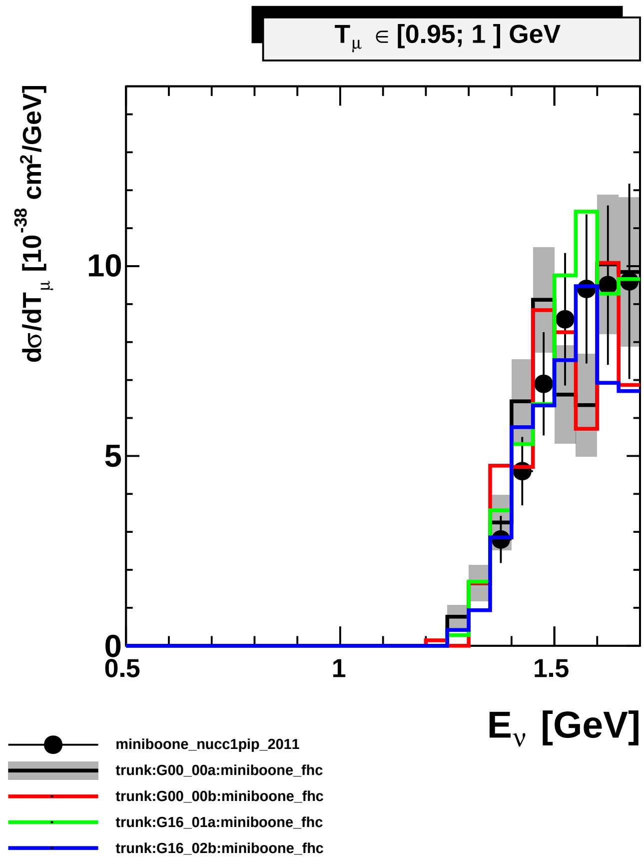


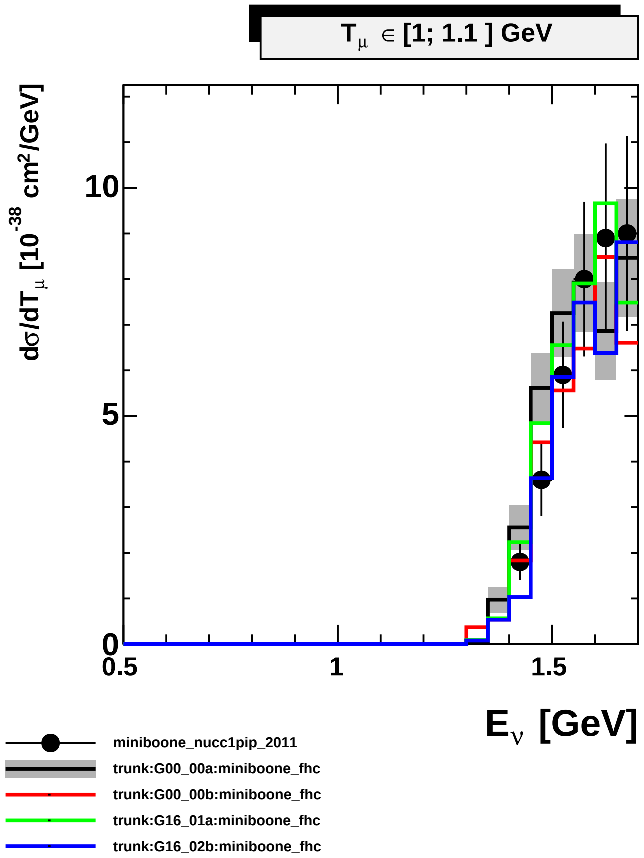
$T_\mu \in$ [0.75; 0.8] GeV
$d\sigma/dT_\mu$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

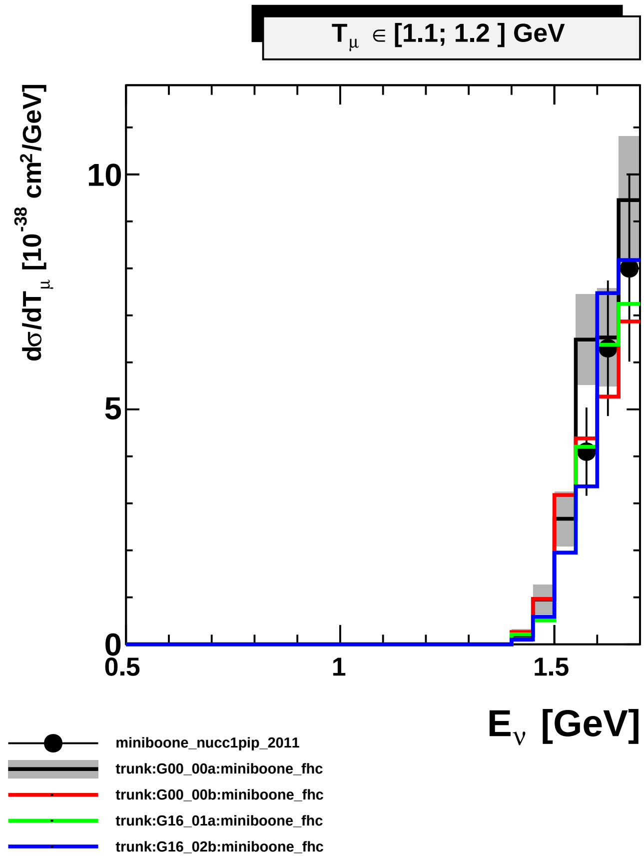

T_μ ∈ [0.8; 0.85] GeV
dσ/dT_μ [10^-38 cm²/GeV]
0
5
10
15
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

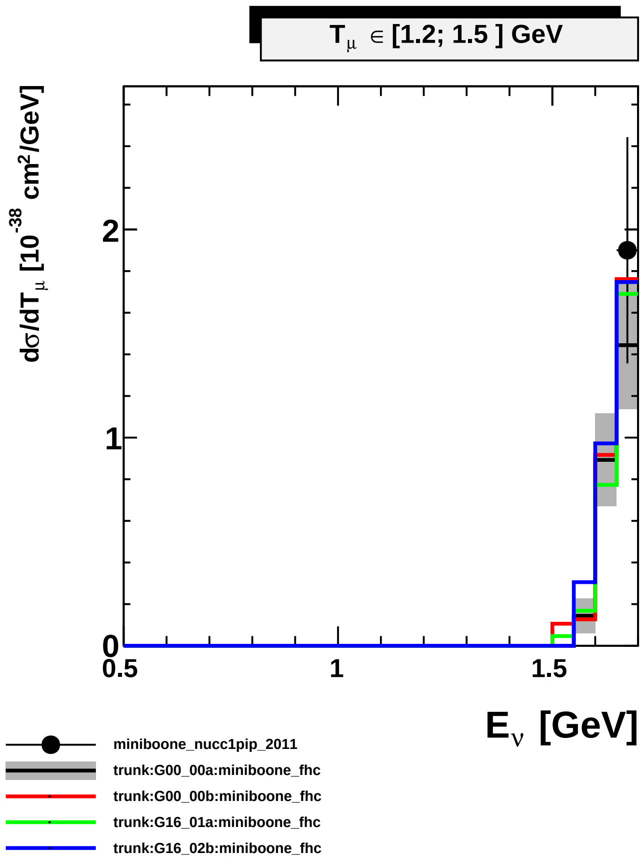

T_μ ∈ [0.85; 0.9] GeV
dσ/dT_μ [10^-38 cm²/GeV]
0
5
10
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

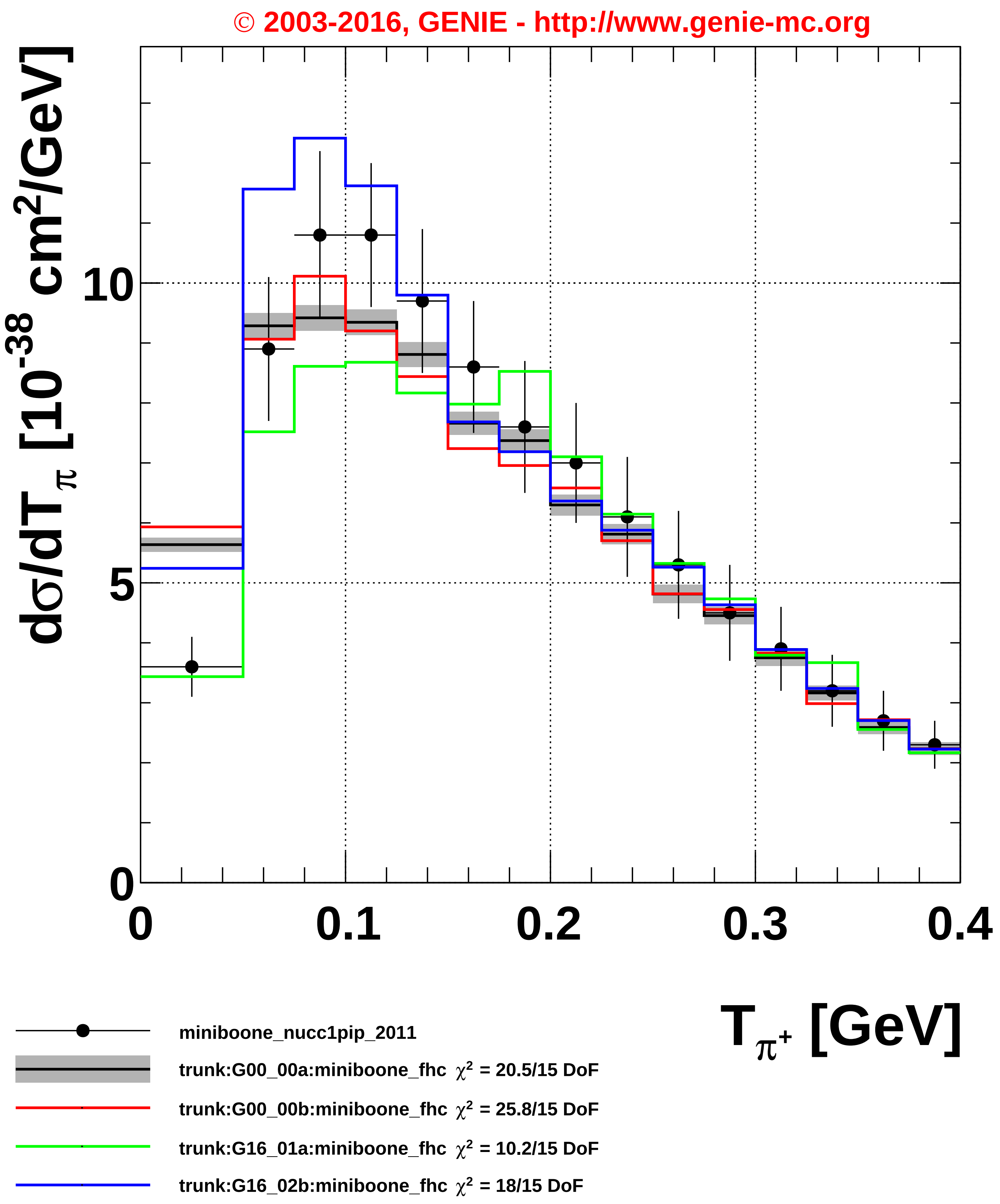

T_μ ∈ [0.9; 0.95] GeV
dσ/dT_μ [10^-38 cm²/GeV]
0
5
10
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


T_μ ∈ [0.95; 1] GeV
dσ/dT_μ [10^-38 cm²/GeV]
0
5
10
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$T_{\mu} \in [1; 1.1]$ GeV
$d\sigma/dT_{\mu}$ $[10^{-38}$ cm^2/GeV]
E_{ν} [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$T_{\mu} \in [1.1; 1.2]$ GeV
$d\sigma/dT_{\mu}$ $[10^{-38}$ cm^2/GeV]
E_{ν} [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$T_{\mu} \in [1.2; 1.5]$ GeV
$d\sigma/dT_{\mu}$ $[10^{-38}$ cm^2/GeV]
E_{ν} [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



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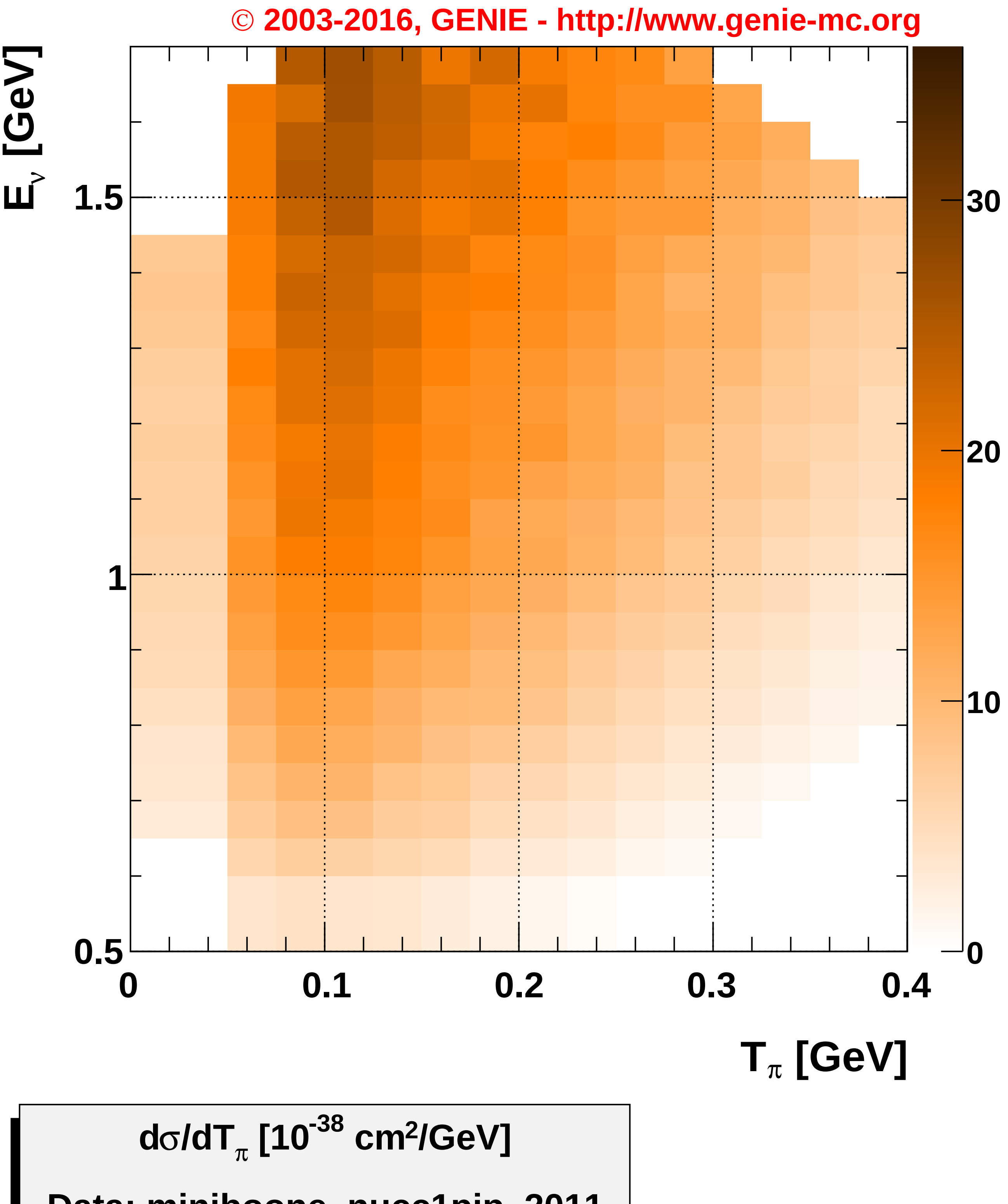
dσ/dT_π [10^-38 cm^2/GeV]
0
5
10
0
0.1
0.2
0.3
0.4
T_π+ [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc χ2 = 20.5/15 DoF
trunk:G00_00b:miniboone_fhc χ2 = 25.8/15 DoF
trunk:G16_01a:miniboone_fhc χ2 = 10.2/15 DoF
trunk:G16_02b:miniboone_fhc χ2 = 18/15 DoF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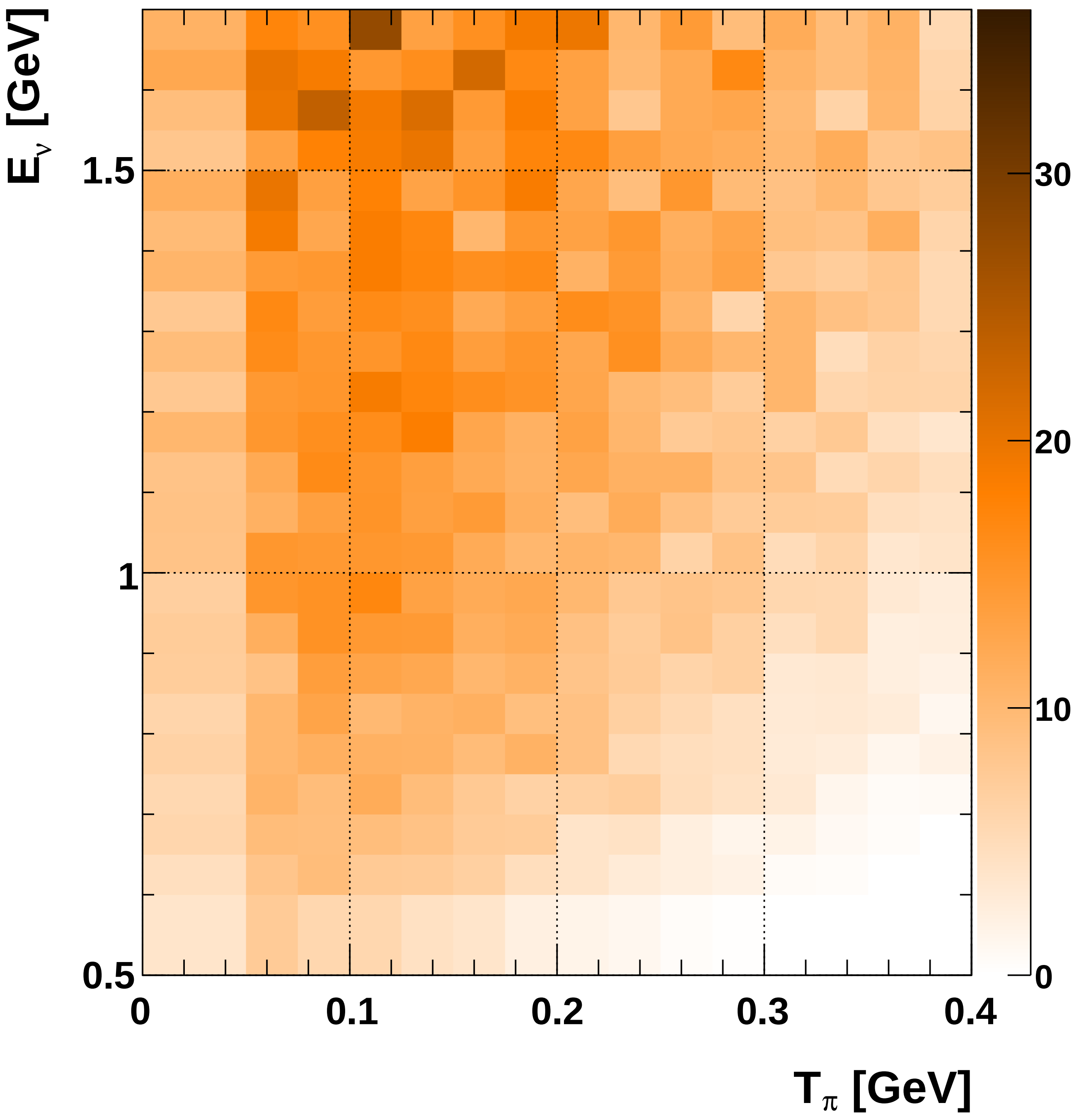
E_ν [GeV]
1.5
1
0.5
0
0.1
0.2
0.3
0.4
30
20
10
0
T_π [GeV]
dσ/dT_π [10^-38 cm^2/GeV]
Data: miniboone_nucc1pip_2011



$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]

Pred: trunk:G00_00a:miniboone_fhc

miniboone_nucc1pip_2011

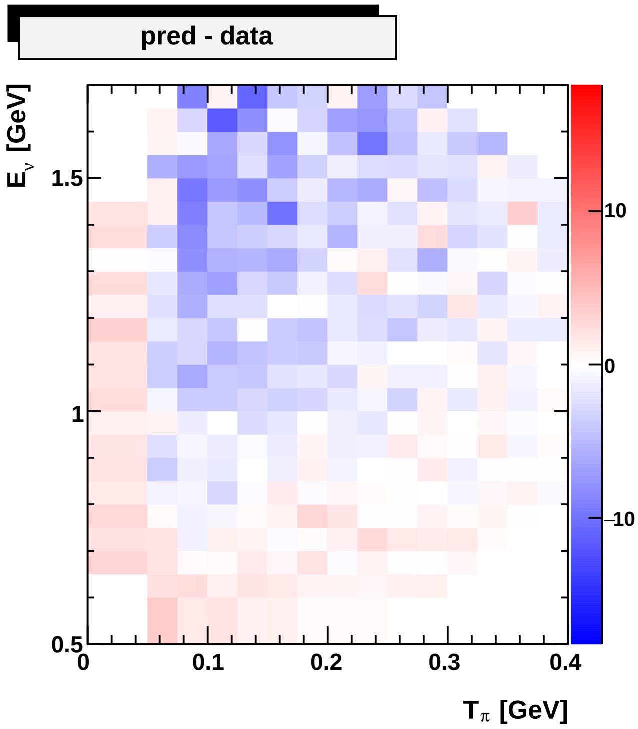
vs

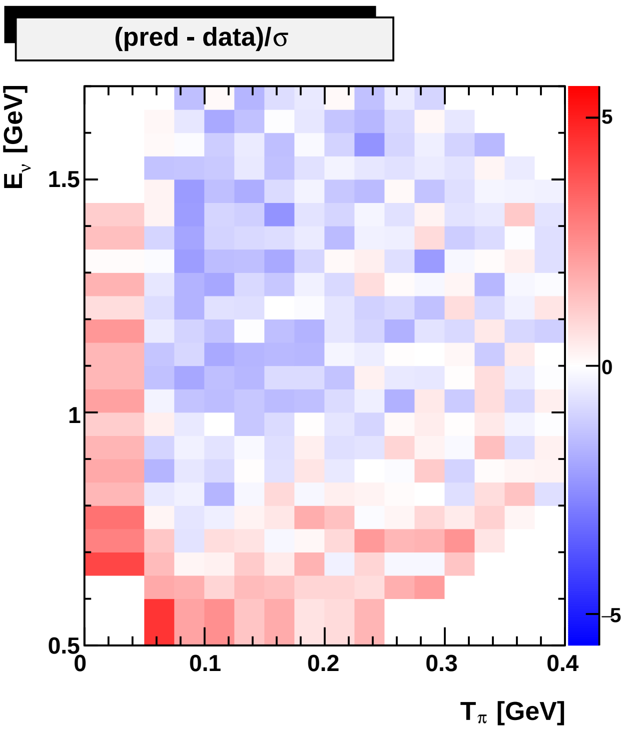
trunk:G00_00a:miniboone_fhc

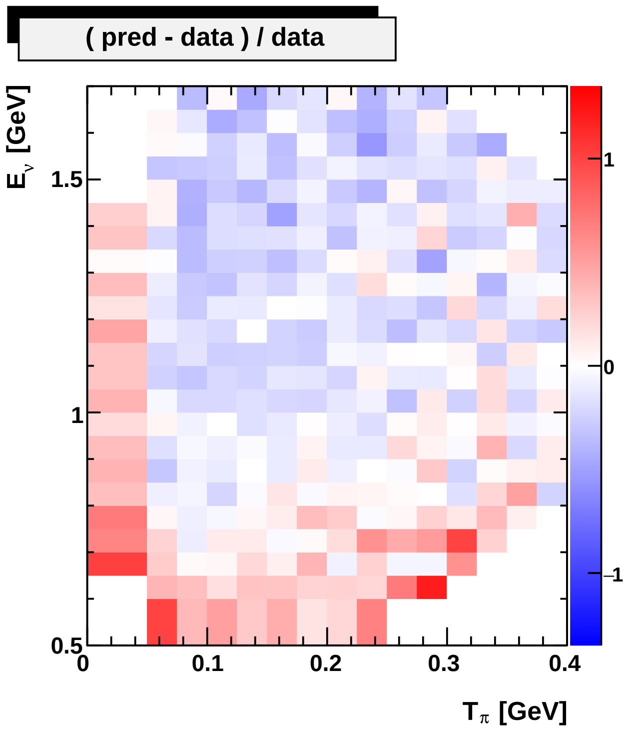
$d\sigma/dT_{\pi}$

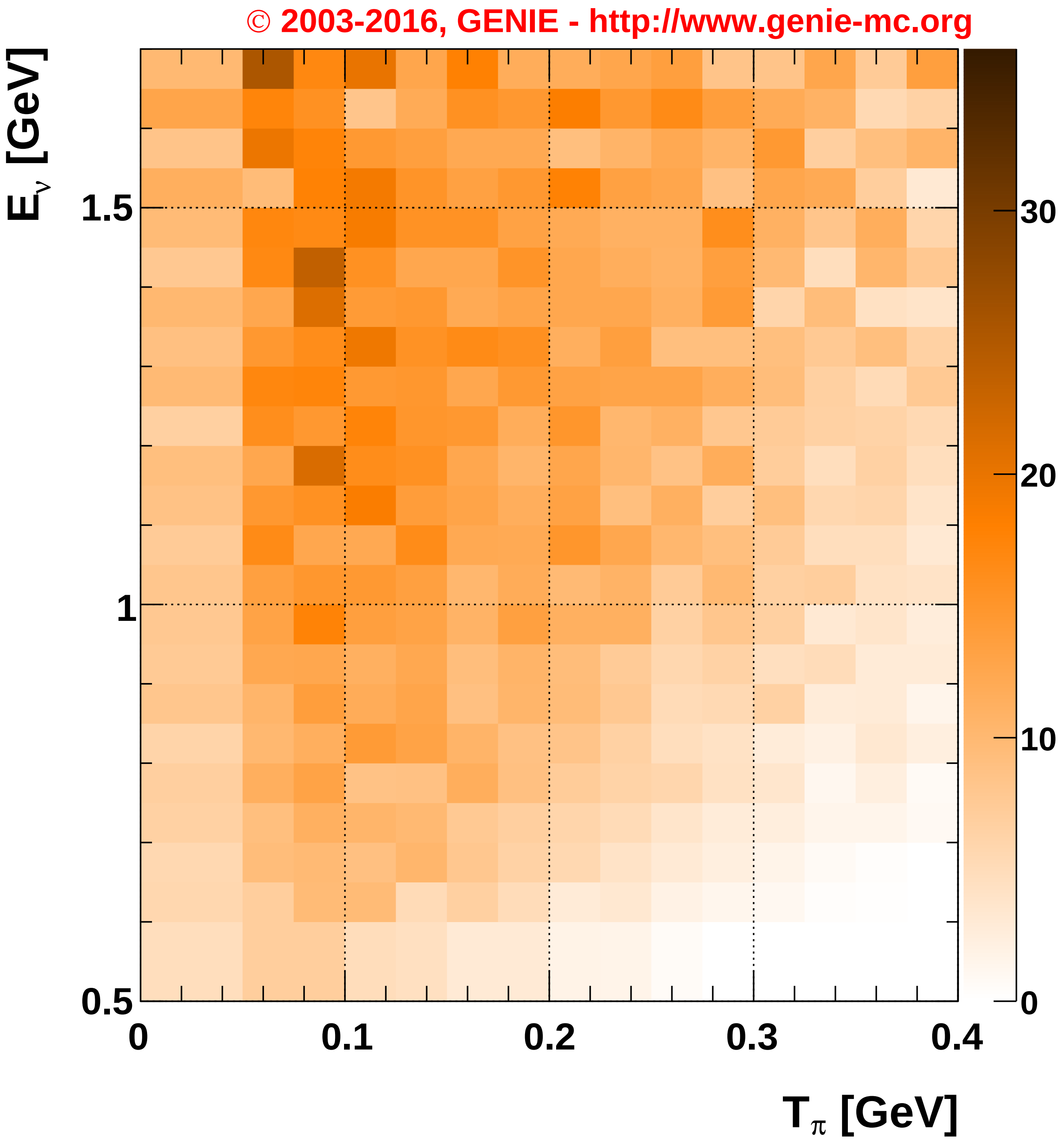
[10^{-38} cm^2/GeV]

χ^2 = 384.662/311 DoF









$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]

Pred: trunk:G00_00b:miniboone_fhc

miniboone_nucc1pip_2011

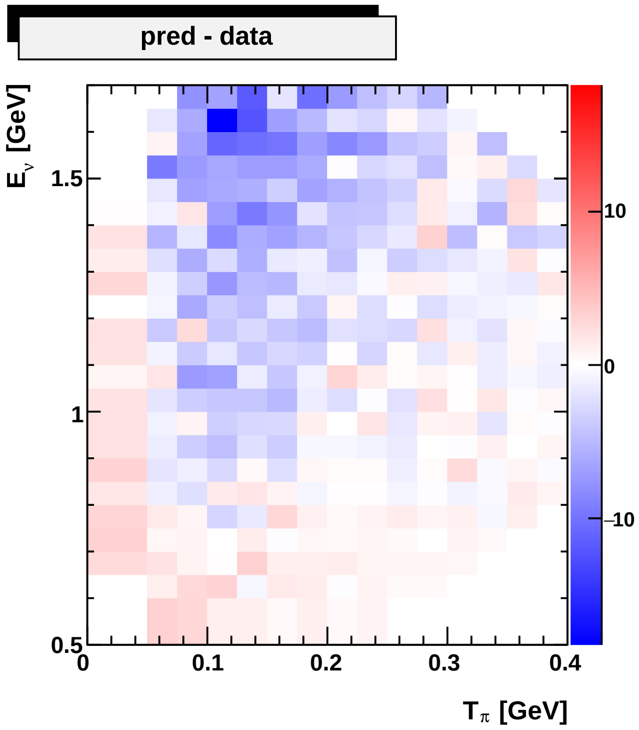
VS

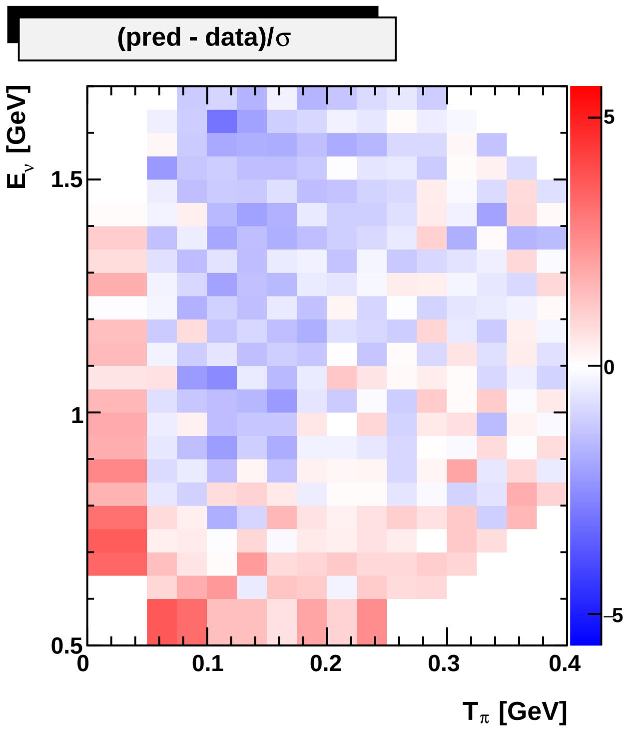
trunk:G00_00b:miniboone_fhc

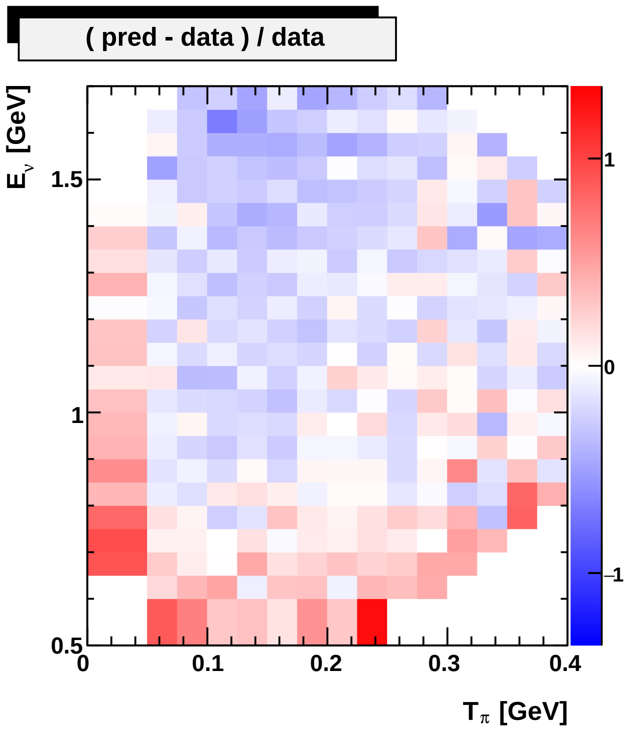
$d\sigma/dT_{\pi}$

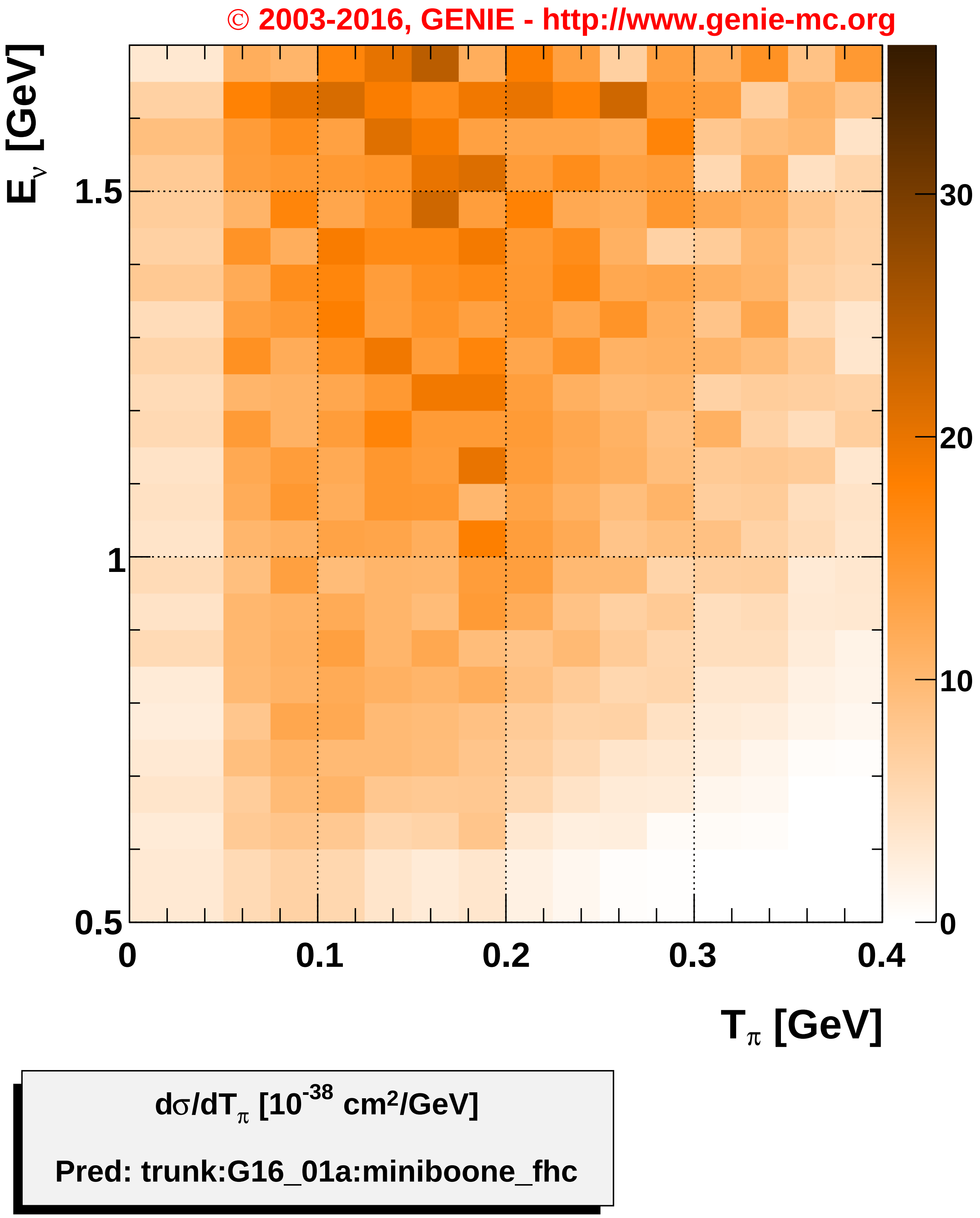
$[10^{-38}\ cm^2/GeV]$

χ^2 = 410.856/311 DoF








© 2003-2016, GENIE - http://www.genie-mc.org
E_ν [GeV]
1.5
1
0.5
0
0.1
0.2
0.3
0.4
T_π [GeV]
30
20
10
0
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
Pred: trunk:G16_01a:miniboone_fhc

miniboone_nucc1pip_2011

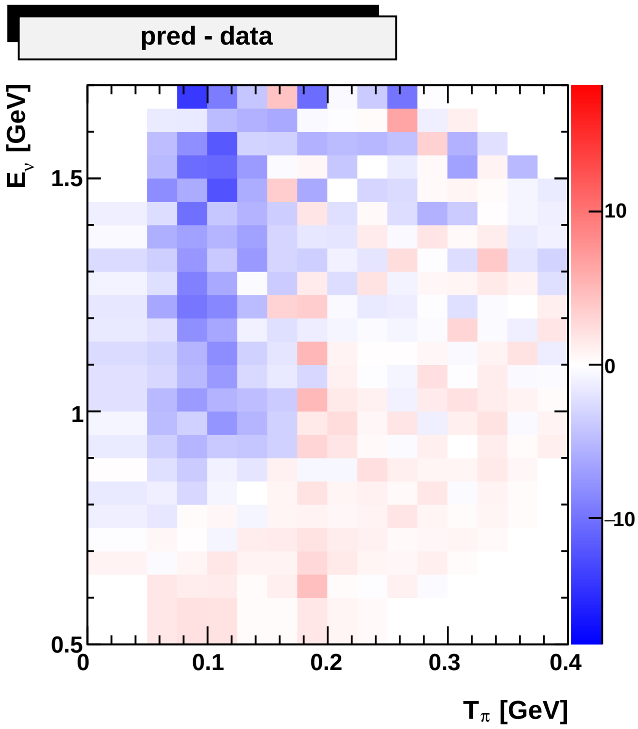
VS

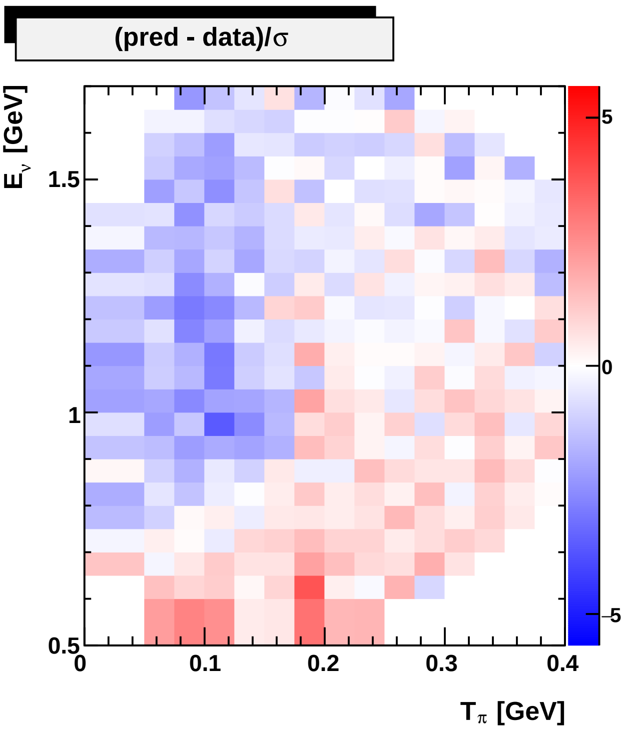
trunk:G16_01a:miniboone_fhc

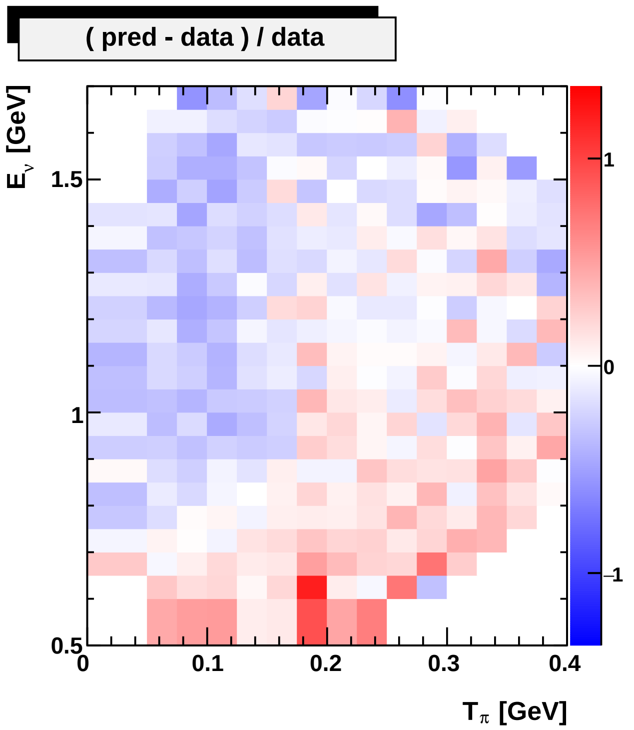
$d\sigma/dT_\pi$

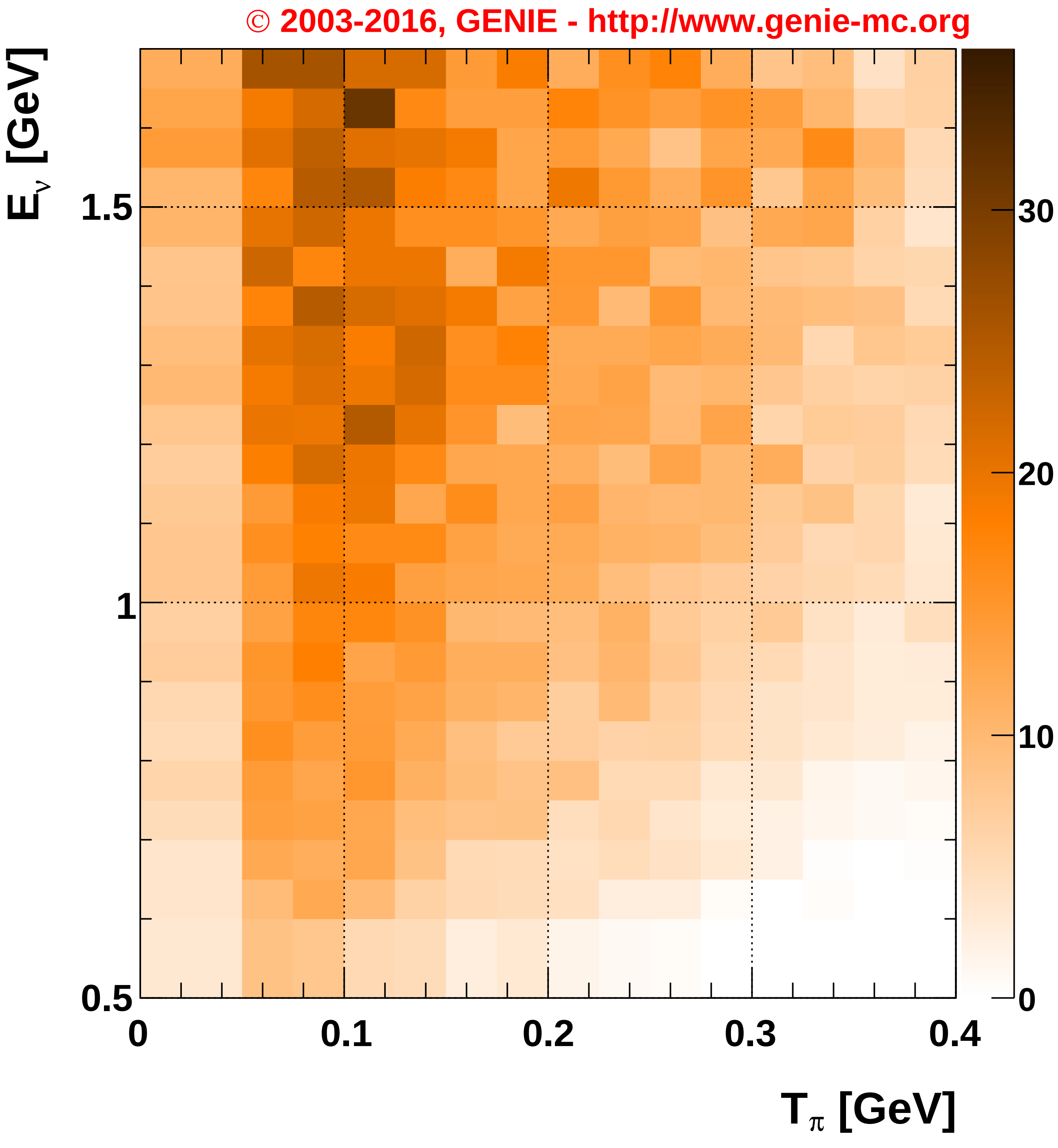
$[10^{-38}\ \mathrm{cm^2/GeV}]$

χ^2 = 440.986/311 DoF









$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]

Pred: trunk:G16_02b:miniboone_fhc

miniboone_nucc1pip_2011

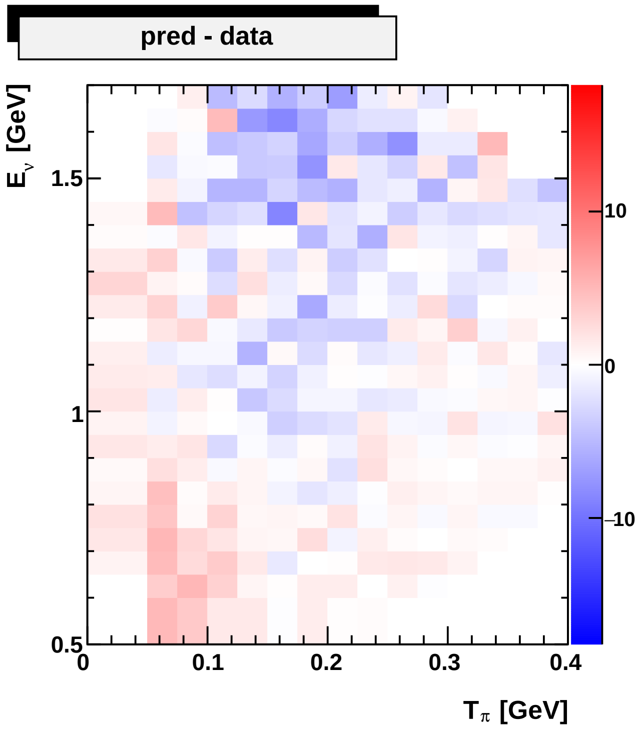
VS

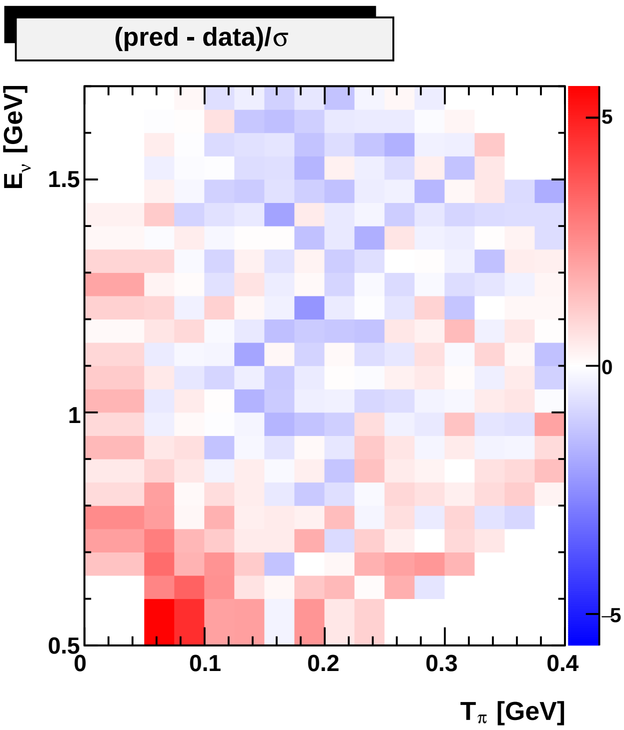
trunk:G16_02b:miniboone_fhc

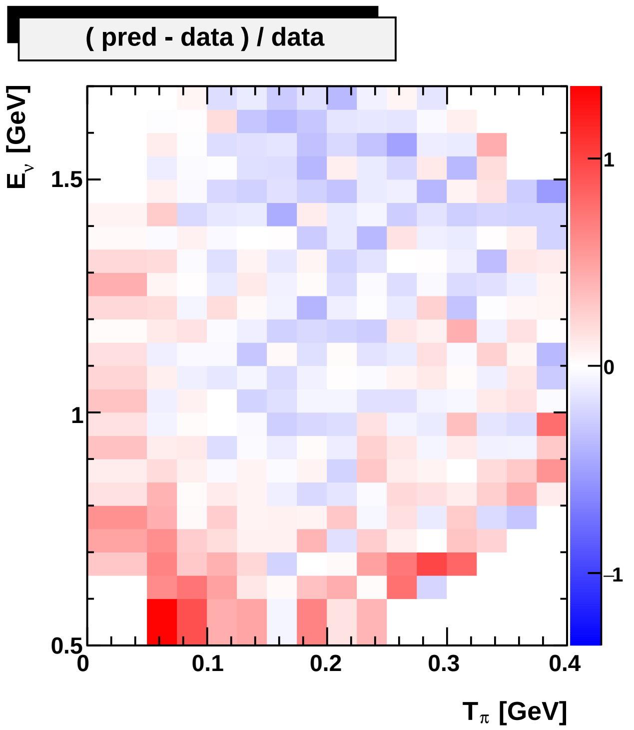
$d\sigma/dT_{\pi}$

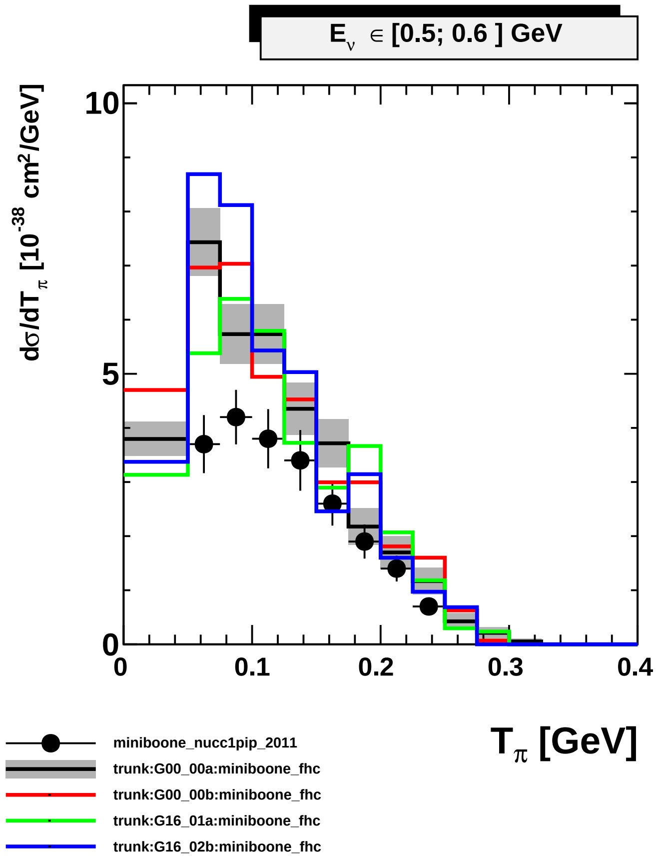
$[10^{-38}\ cm^2/GeV]$

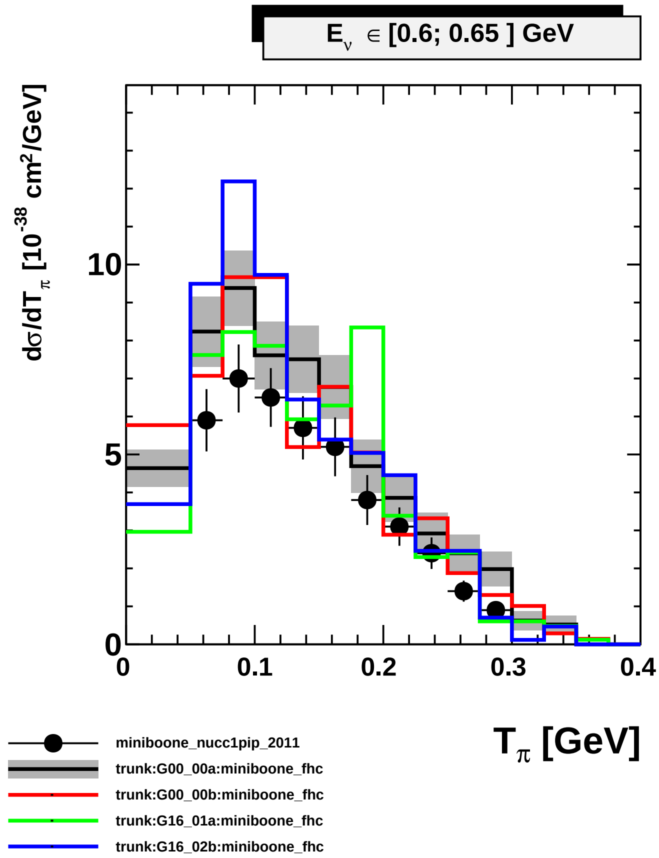
χ^2 = 347.541/311 DoF

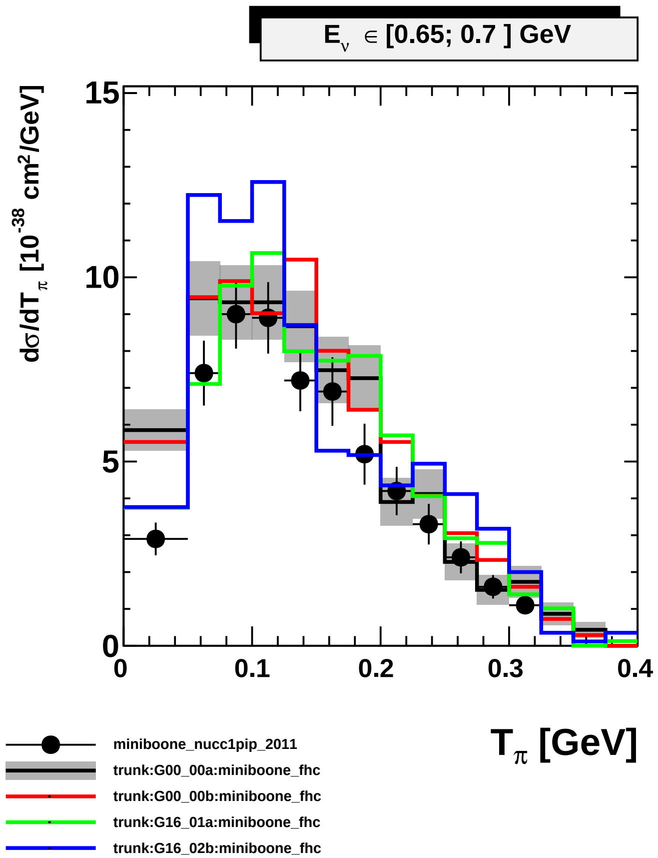


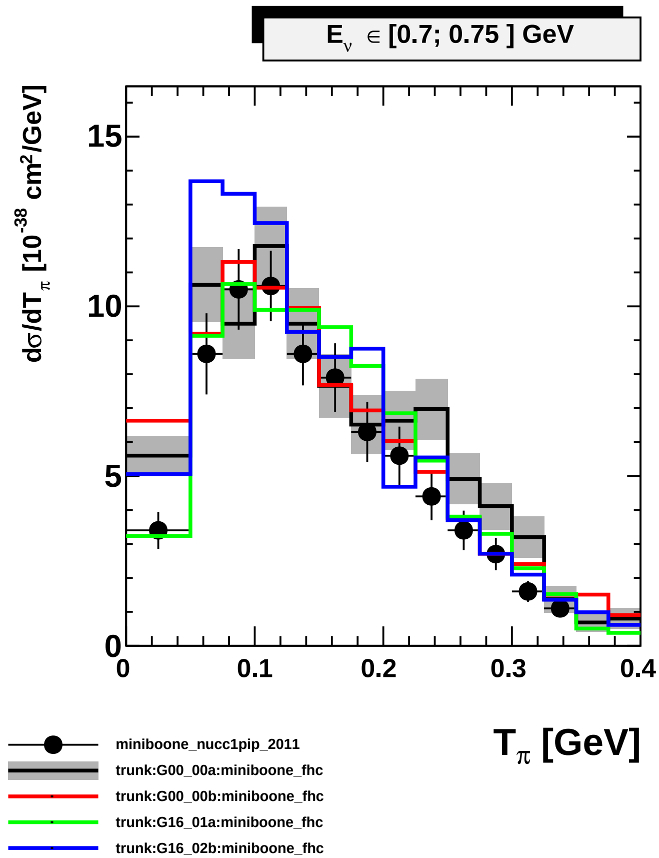


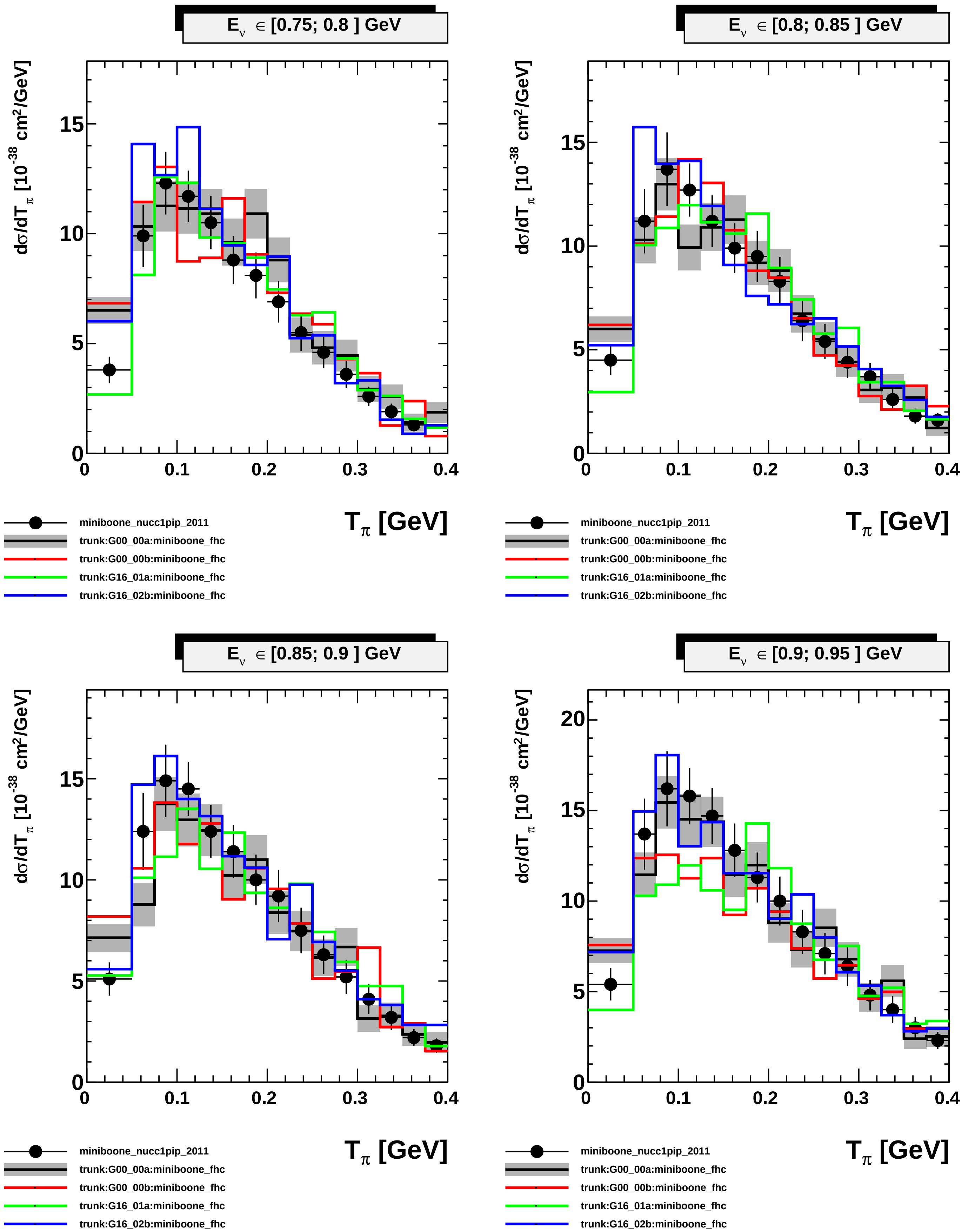



E_ν ∈ [0.5; 0.6] GeV
dσ/dT_π [10^-38 cm²/GeV]
T_π [GeV]
0
5
10
0
0.1
0.2
0.3
0.4
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

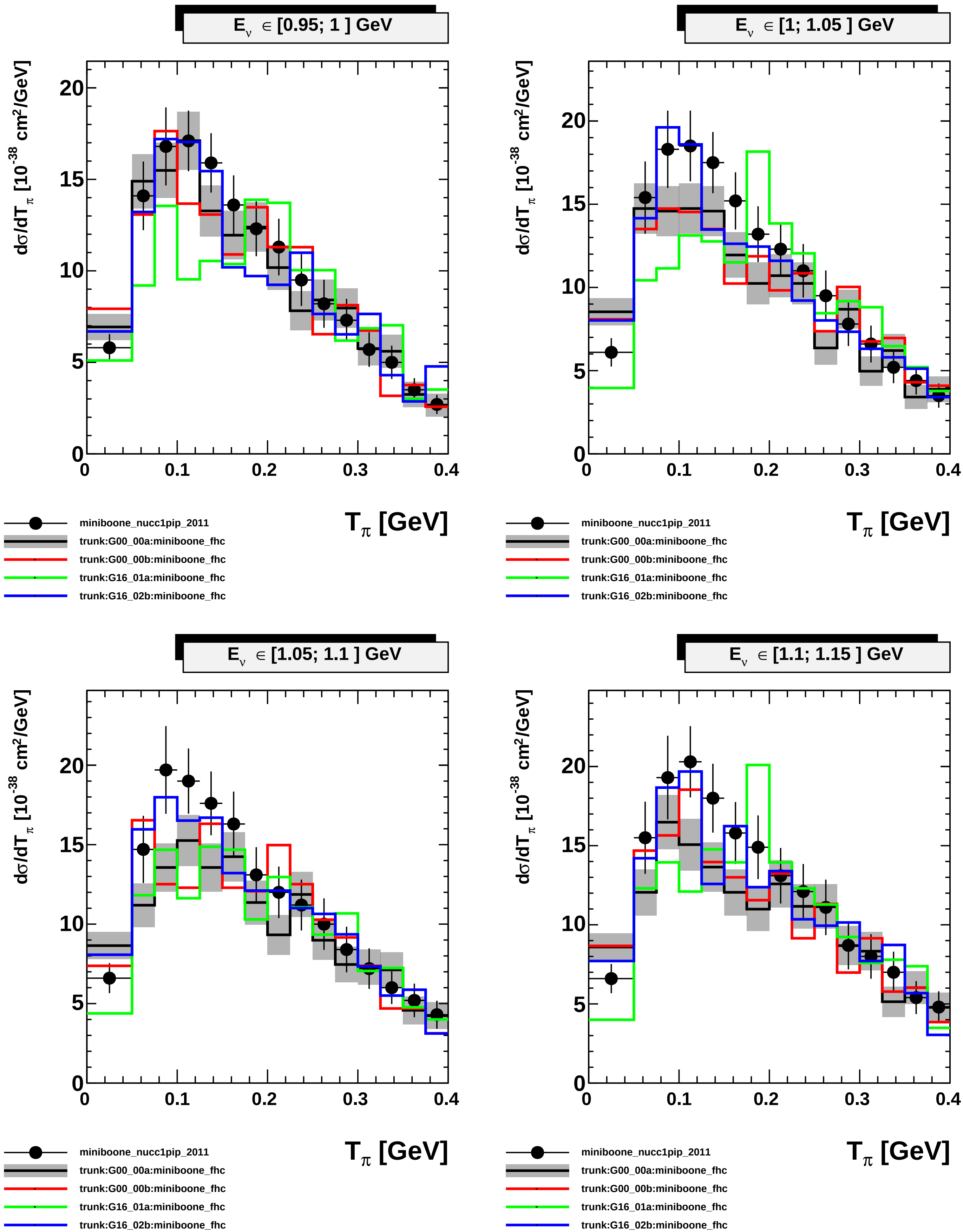

E_ν ∈ [0.6; 0.65] GeV
dσ/dT_π [10^-38 cm²/GeV]
T_π [GeV]
0
5
10
0
0.1
0.2
0.3
0.4
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


E_ν ∈ [0.65; 0.7] GeV
dσ/dT_π [10^-38 cm²/GeV]
T_π [GeV]
0
5
10
15
0
0.1
0.2
0.3
0.4
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

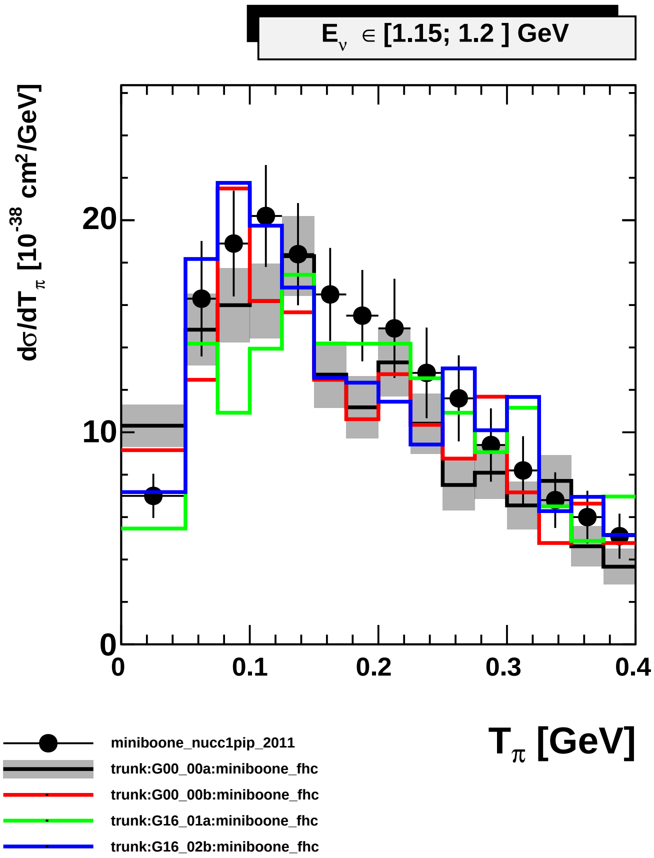

E_ν ∈ [0.7; 0.75] GeV
dσ/dT_π [10^-38 cm²/GeV]
T_π [GeV]
0
5
10
15
0
0.1
0.2
0.3
0.4
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

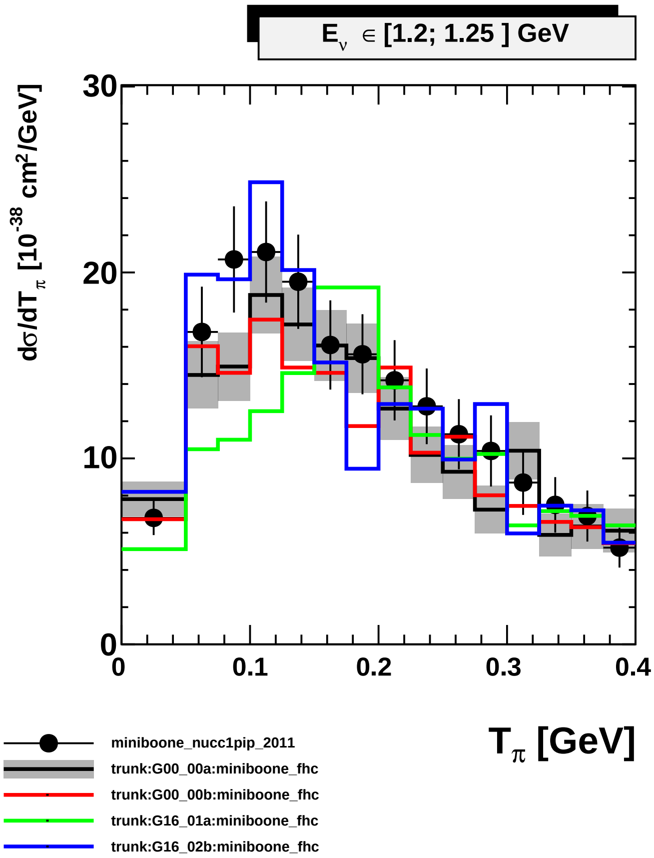


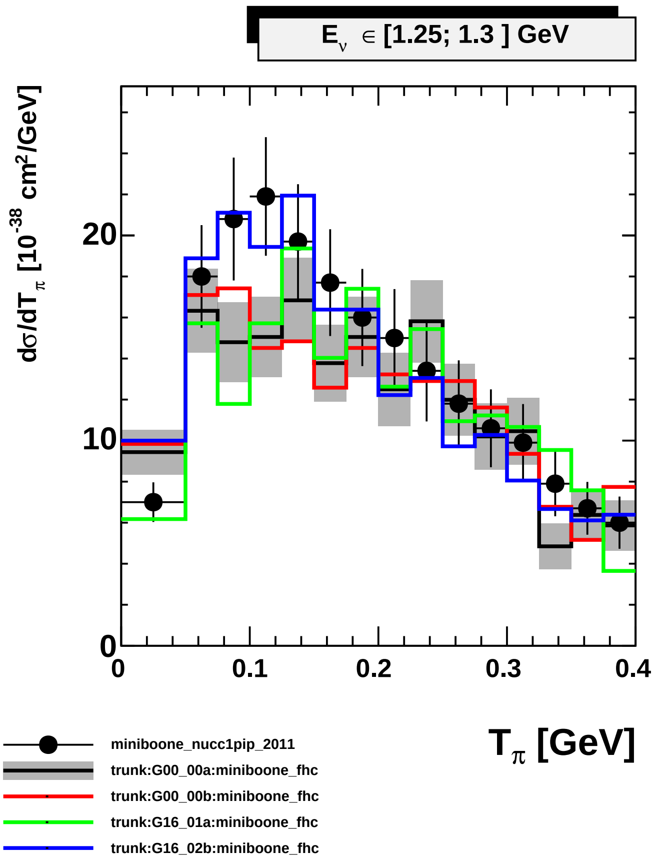
$E_\nu \in [0.75; 0.8]$ GeV
$E_\nu \in [0.8; 0.85]$ GeV
$E_\nu \in [0.85; 0.9]$ GeV
$E_\nu \in [0.9; 0.95]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

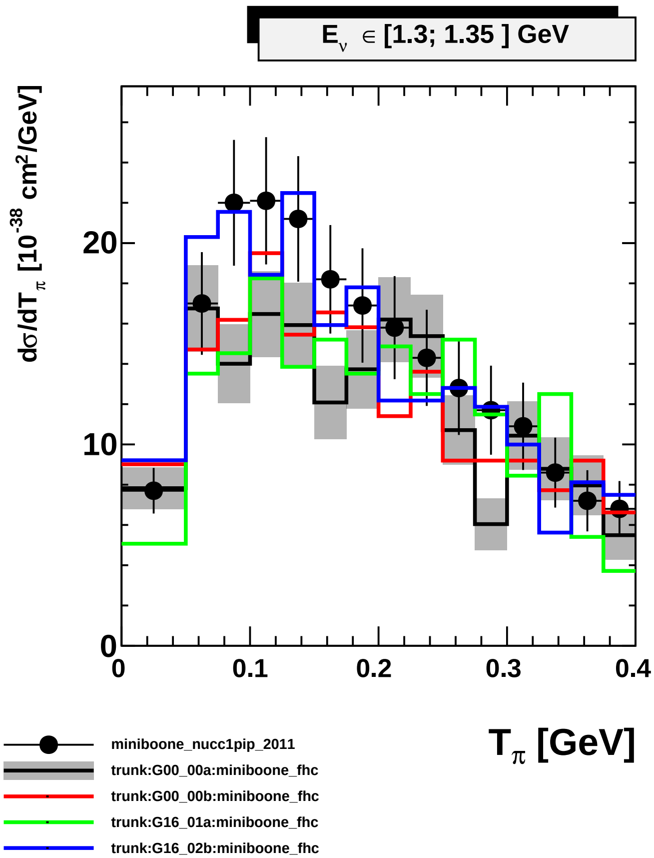


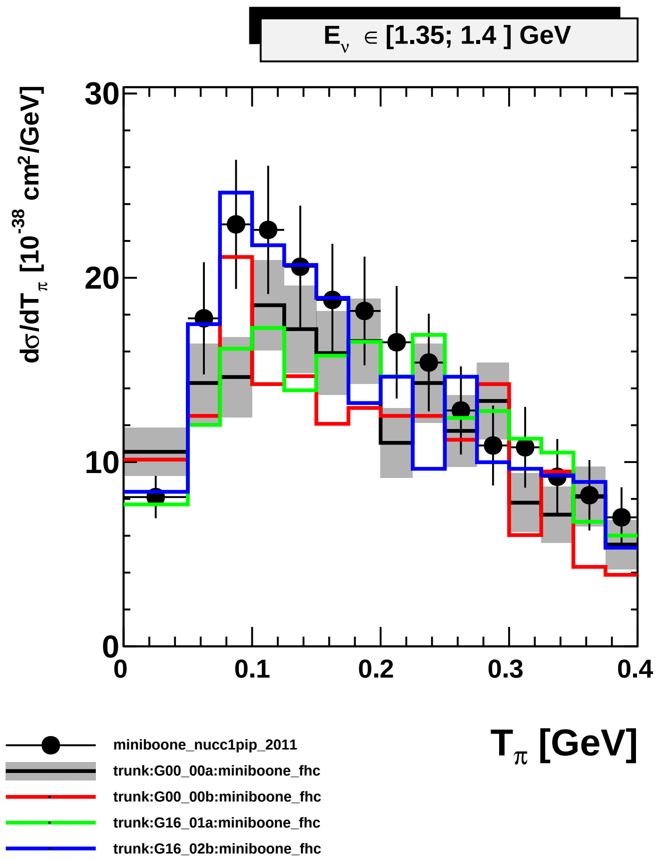
$E_\nu \in$ [0.95; 1] GeV
$E_\nu \in$ [1; 1.05] GeV
$E_\nu \in$ [1.05; 1.1] GeV
$E_\nu \in$ [1.1; 1.15] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$E_\nu \in$ [1.15; 1.2] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

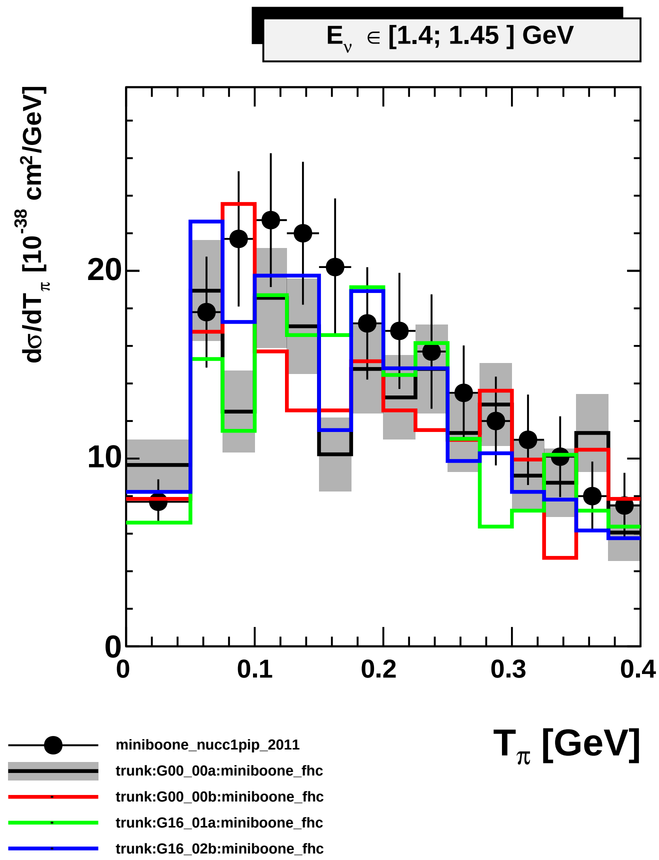

$E_\nu \in$ [1.2; 1.25] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$E_\nu \in$ [1.25; 1.3] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

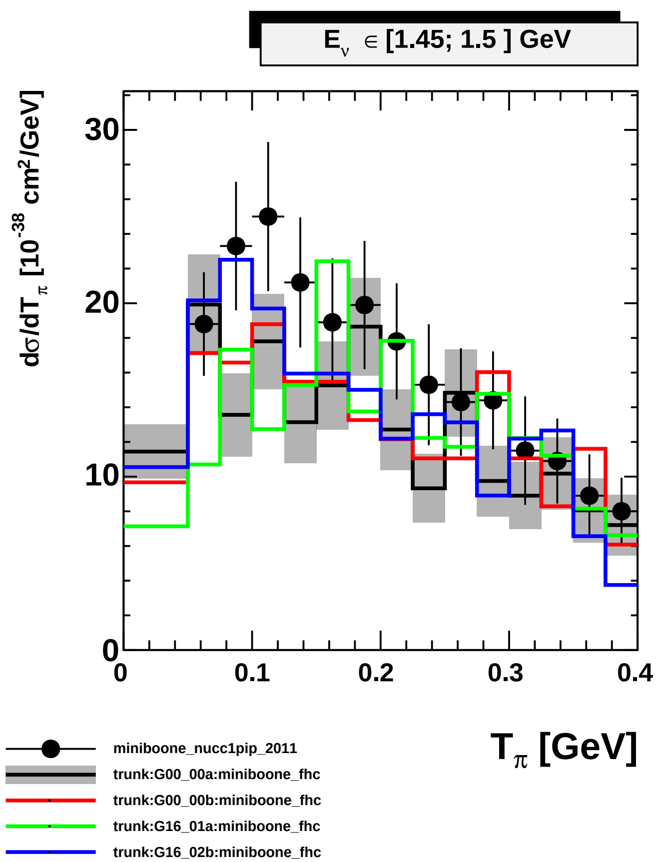

$E_\nu \in$ [1.3; 1.35] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



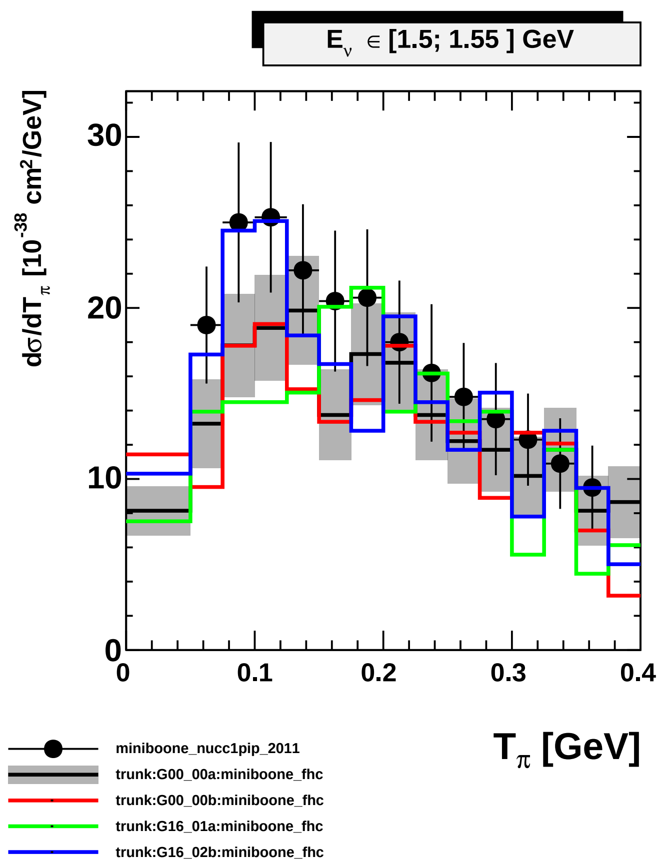
$E_\nu \in$ [1.35; 1.4] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



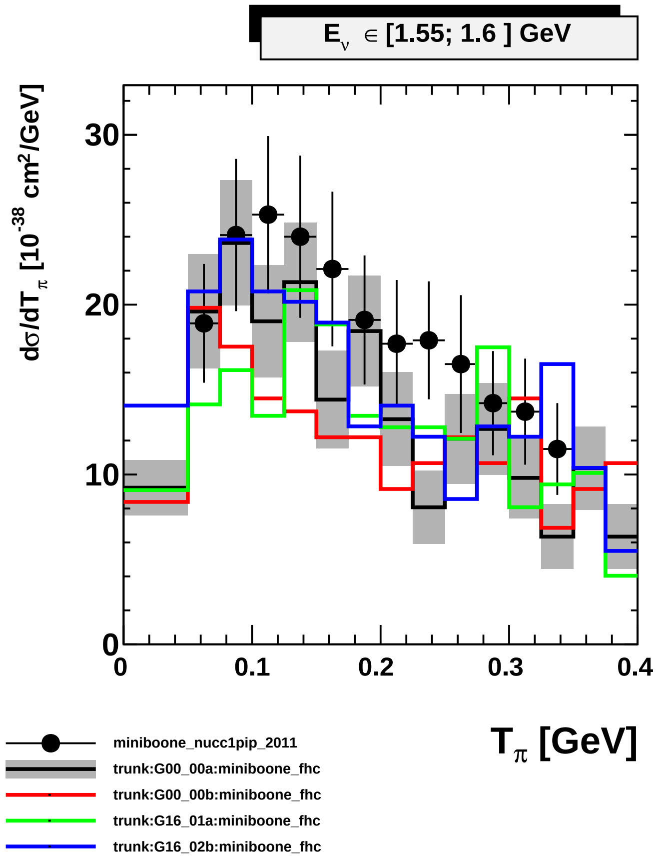
$E_\nu \in$ [1.4; 1.45] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



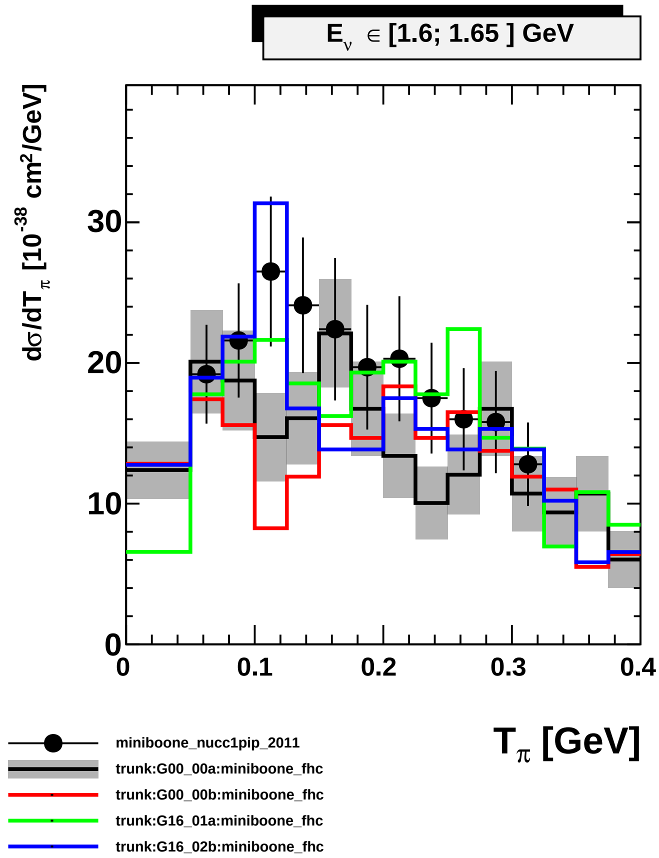
$E_\nu \in$ [1.45; 1.5] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



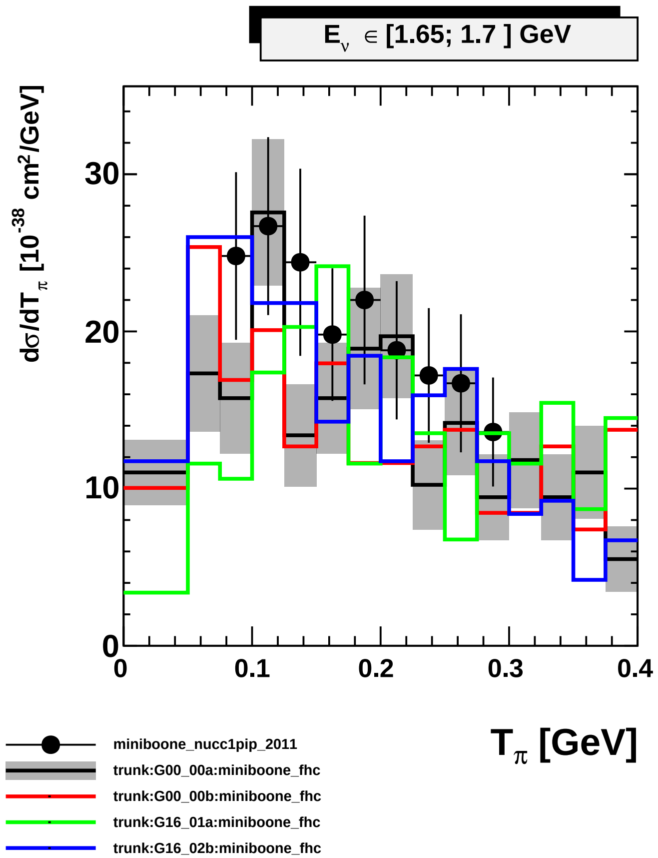
$E_\nu \in$ [1.5; 1.55] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



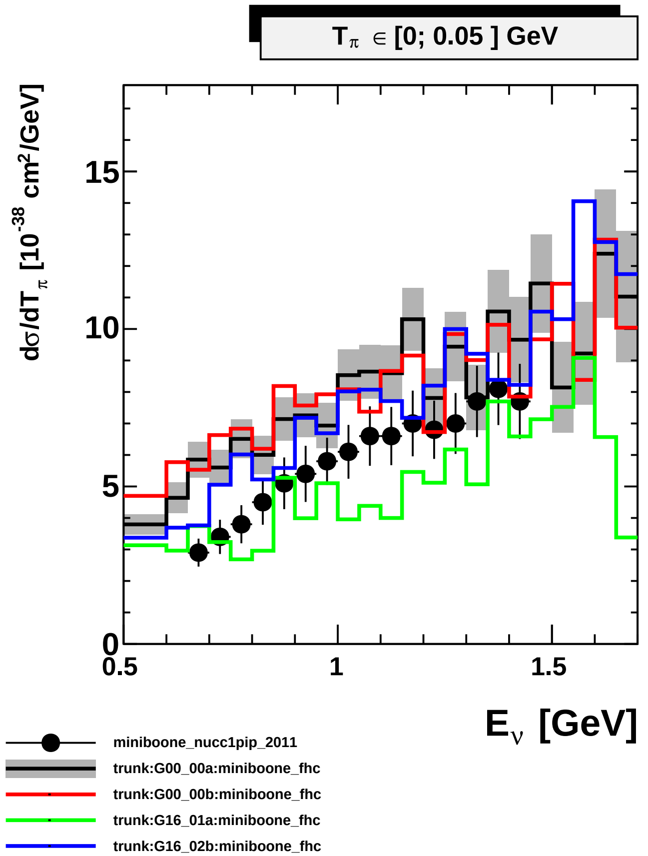
$E_\nu \in [1.55; 1.6]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

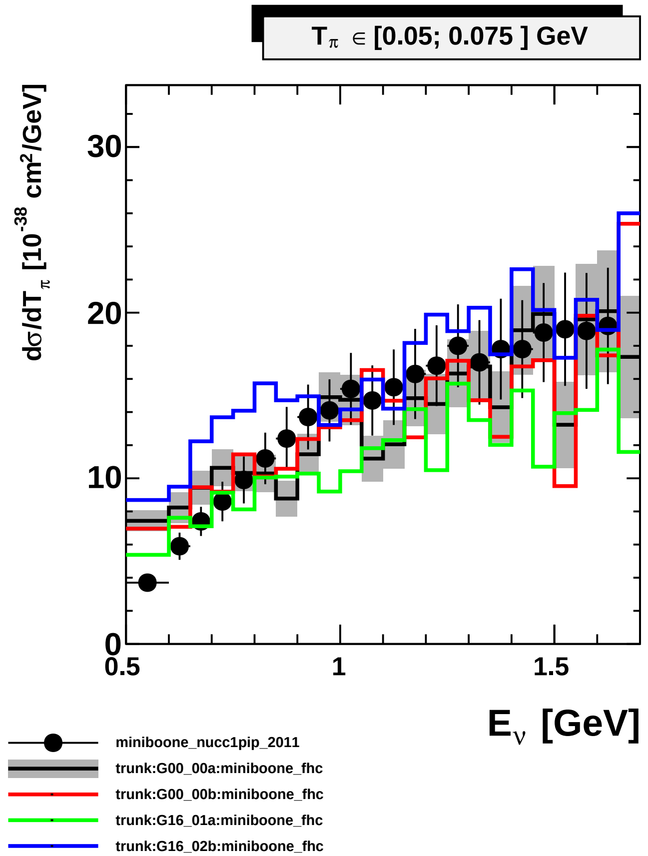


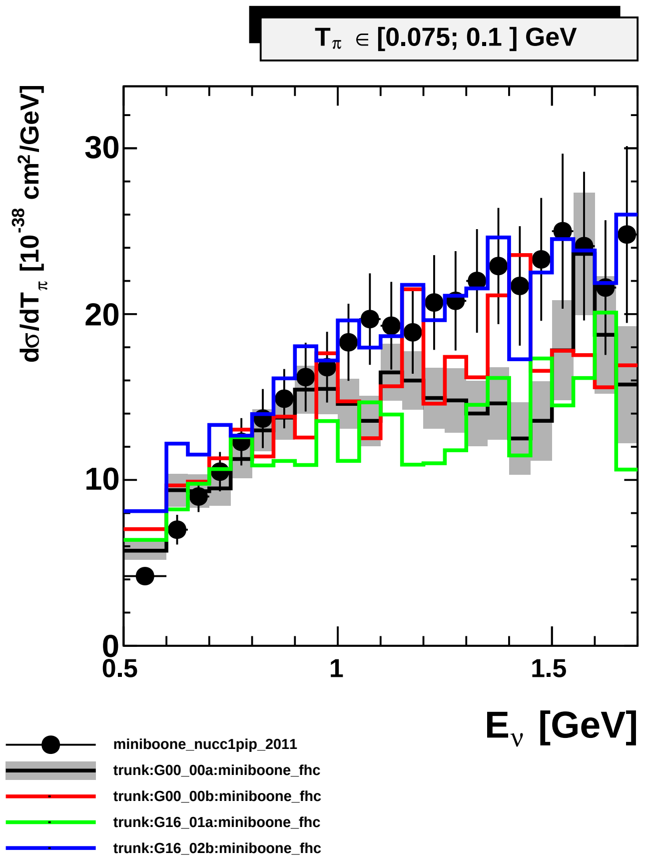
$E_\nu \in [1.6; 1.65]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

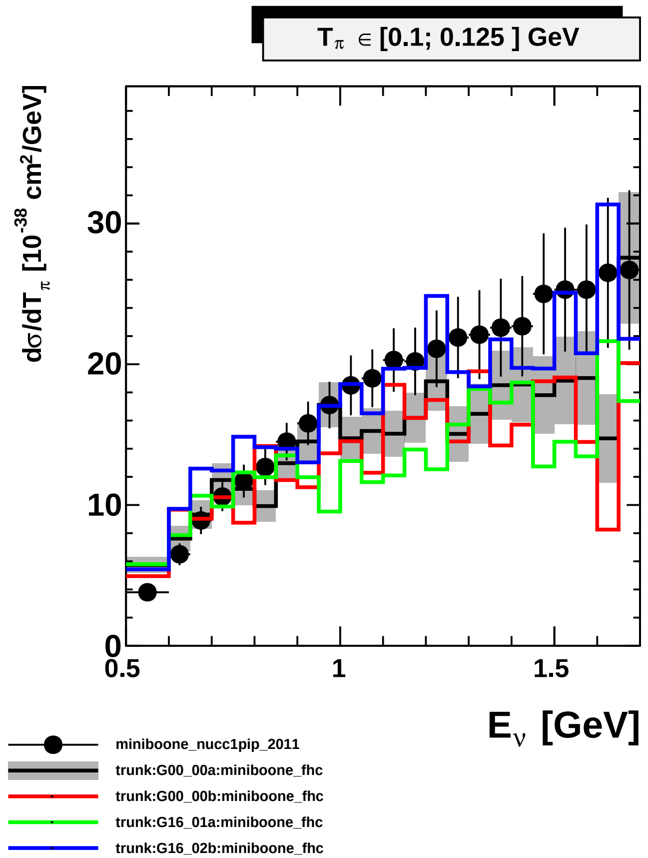


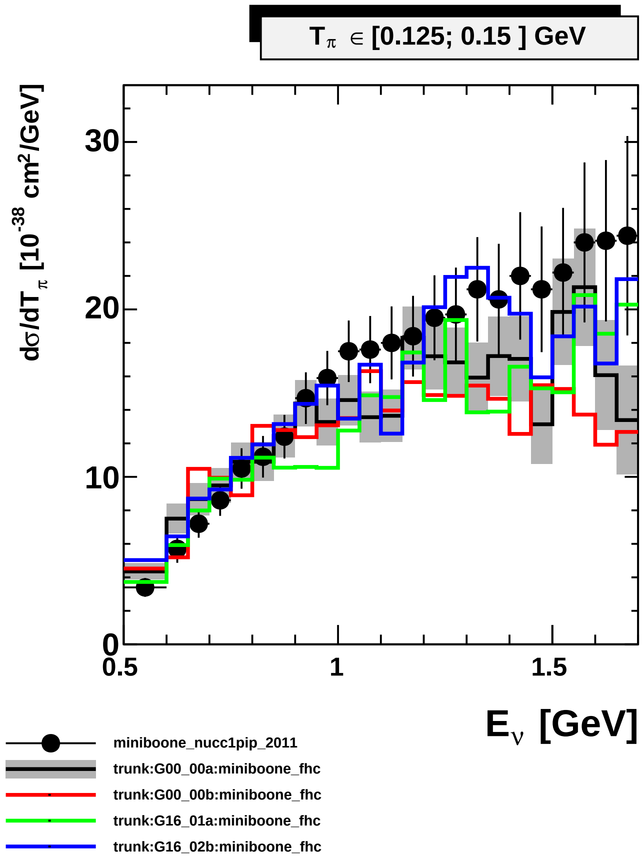
$E_\nu \in [1.65; 1.7]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
T_π [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$T_\pi \in [0; 0.05]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

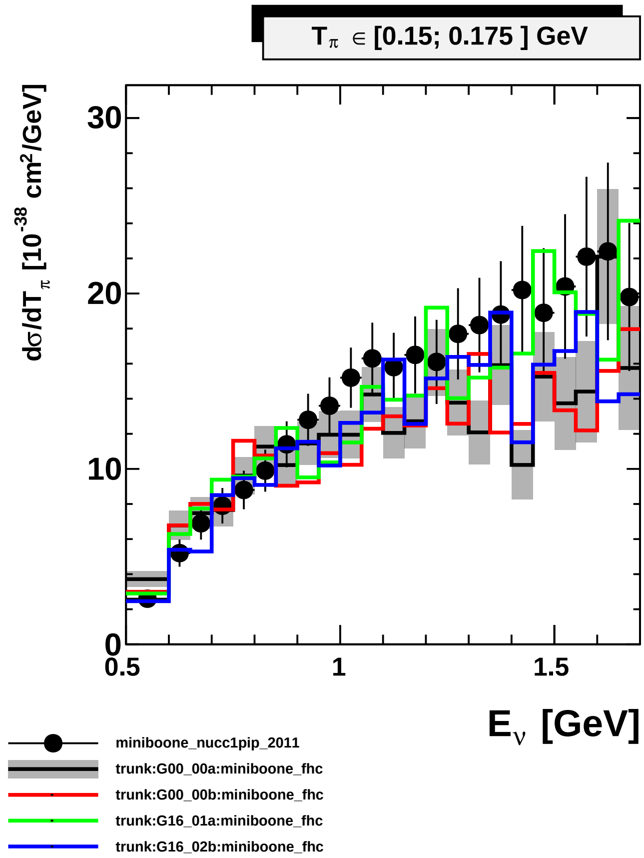

$T_\pi \in [0.05; 0.075]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$T_\pi \in [0.075; 0.1]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

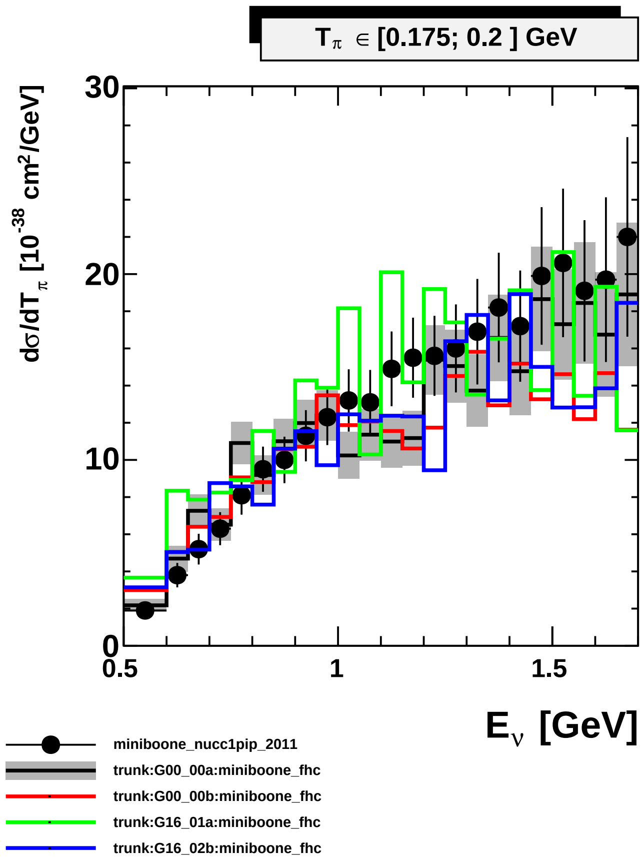

$T_\pi \in [0.1; 0.125]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



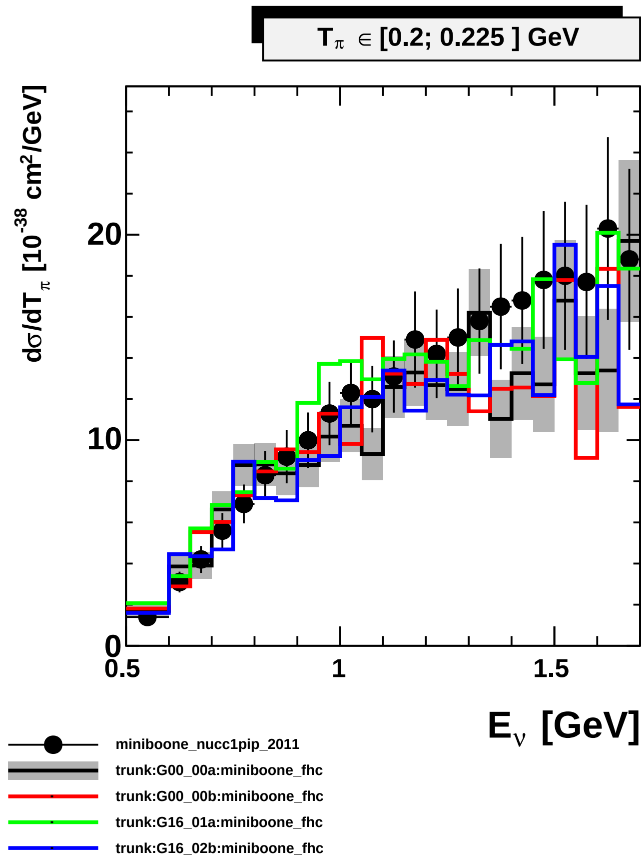
T_π ∈ [0.125; 0.15] GeV
dσ/dT_π [10^-38 cm^2/GeV]
30
20
10
0
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



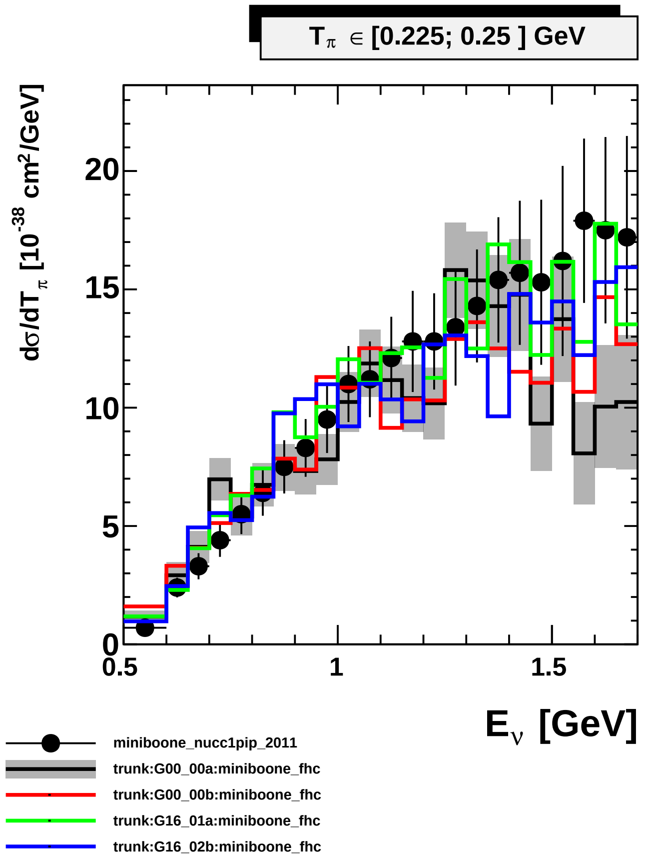
T_π ∈ [0.15; 0.175] GeV
dσ/dT_π [10^-38 cm^2/GeV]
30
20
10
0
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

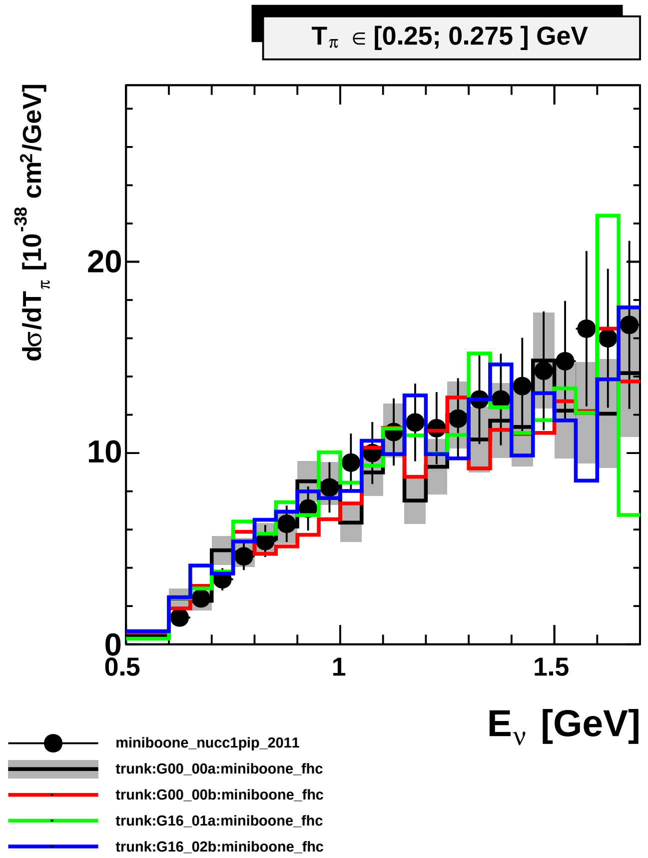


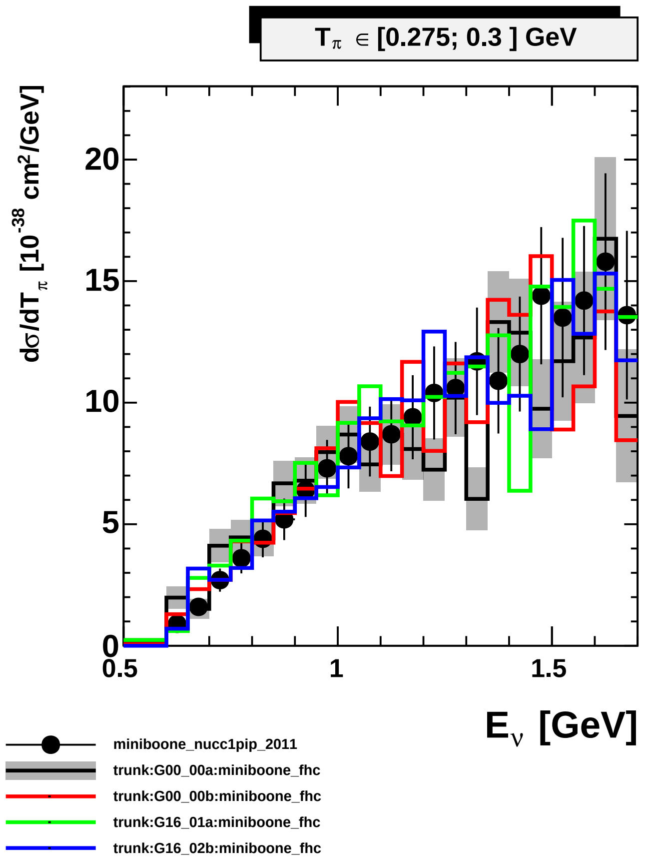
T_π ∈ [0.175; 0.2] GeV
dσ/dT_π [10^-38 cm^2/GeV]
30
20
10
0
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

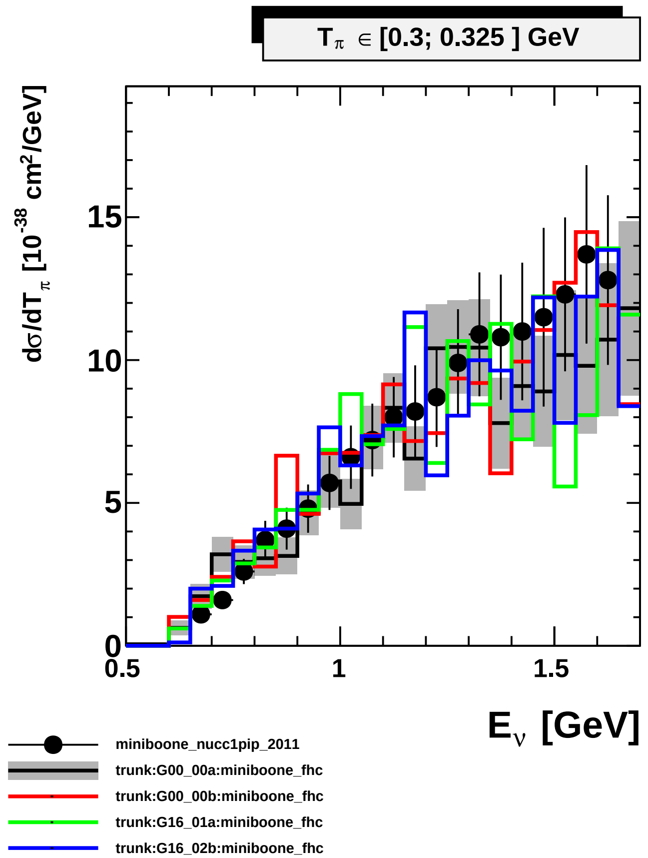


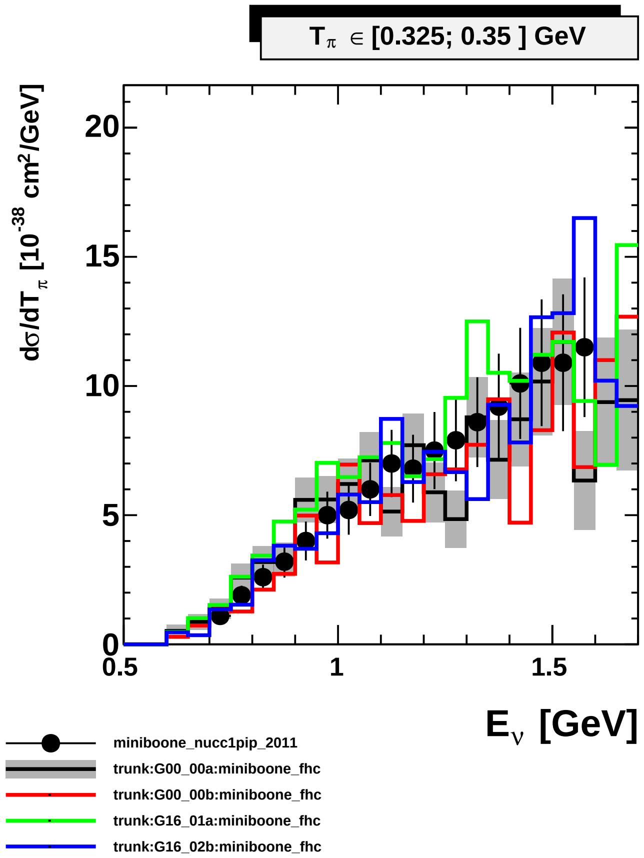
T_π ∈ [0.2; 0.225] GeV
dσ/dT_π [10^-38 cm^2/GeV]
20
10
0
0.5
1
1.5
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$T_\pi \in [0.225; 0.25]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
0
5
10
15
20
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

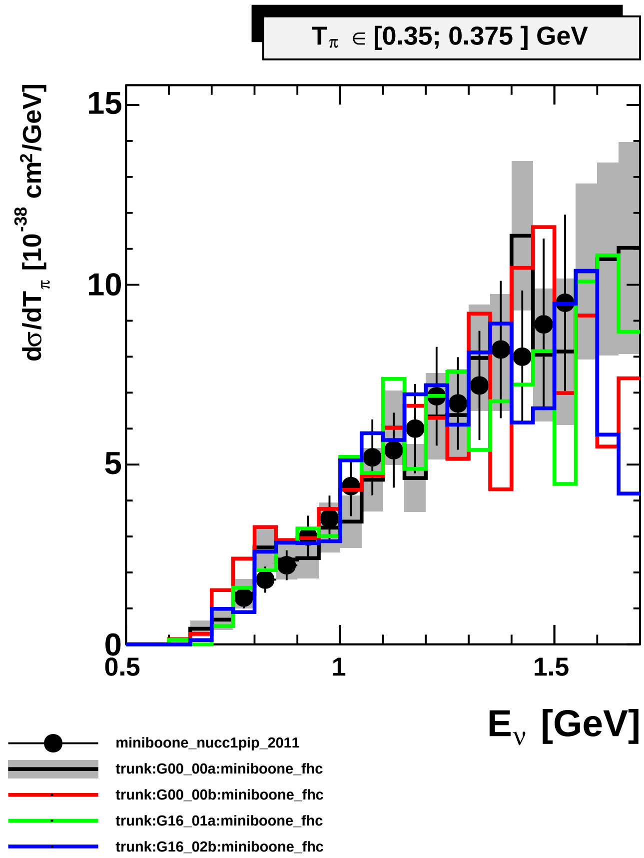

$T_\pi \in [0.25; 0.275]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
0
10
20
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc


$T_\pi \in [0.275; 0.3]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
0
5
10
15
20
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

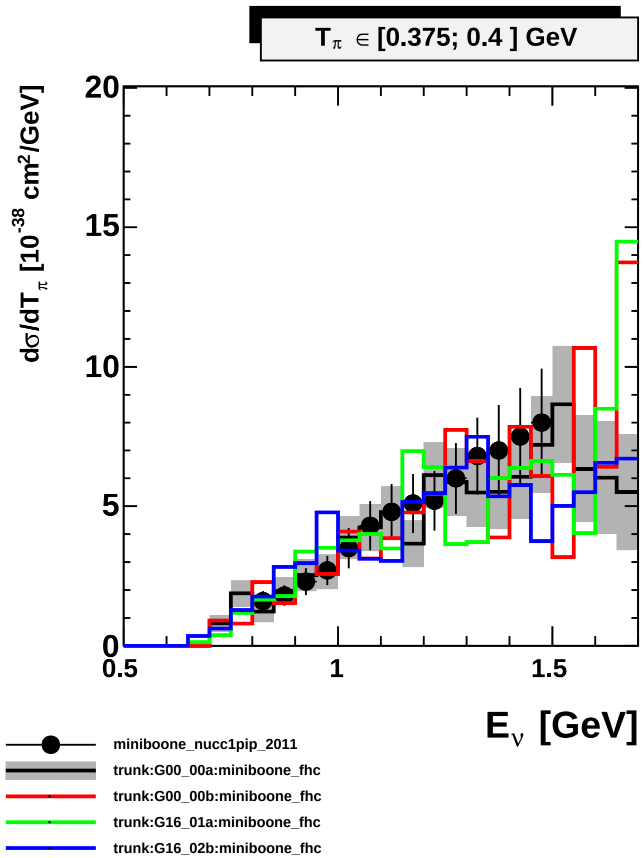

$T_\pi \in [0.3; 0.325]$ GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
0
5
10
15
0.5
1
1.5
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



$T_\pi \in$ [0.325; 0.35] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



$T_\pi \in$ [0.35; 0.375] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc



$T_\pi \in$ [0.375; 0.4] GeV
$d\sigma/dT_\pi$ [10^{-38} cm^2/GeV]
E_ν [GeV]
miniboone_nucc1pip_2011
trunk:G00_00a:miniboone_fhc
trunk:G00_00b:miniboone_fhc
trunk:G16_01a:miniboone_fhc
trunk:G16_02b:miniboone_fhc

GENIE Comparisons with MiniBooNE CC $1\pi^0$ data

Dataset:
miniboone_nucc1pi0_2010

Models:
trunk/G00_00a
trunk/G00_00b
trunk/G16_01a
trunk/G16_02b

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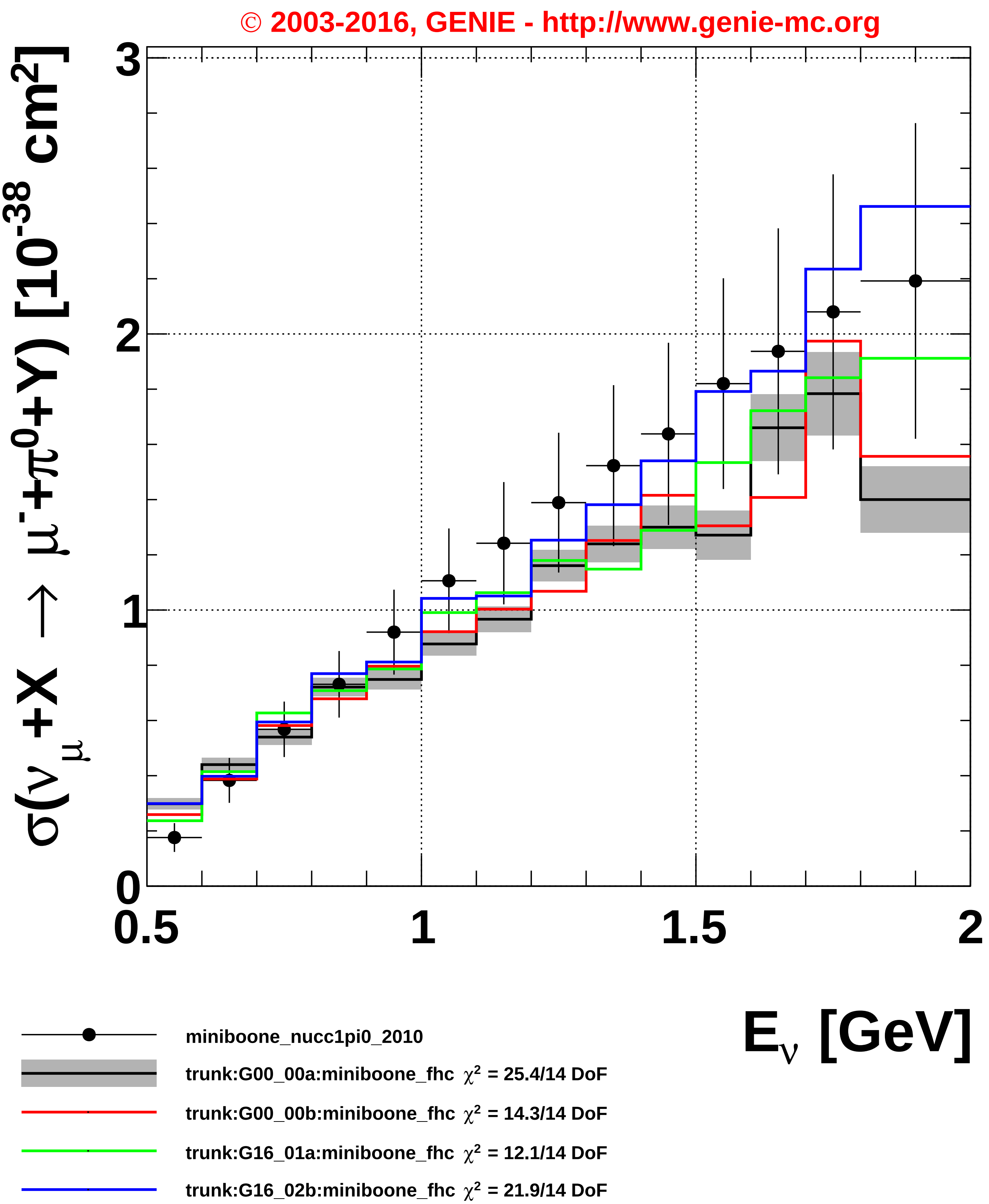
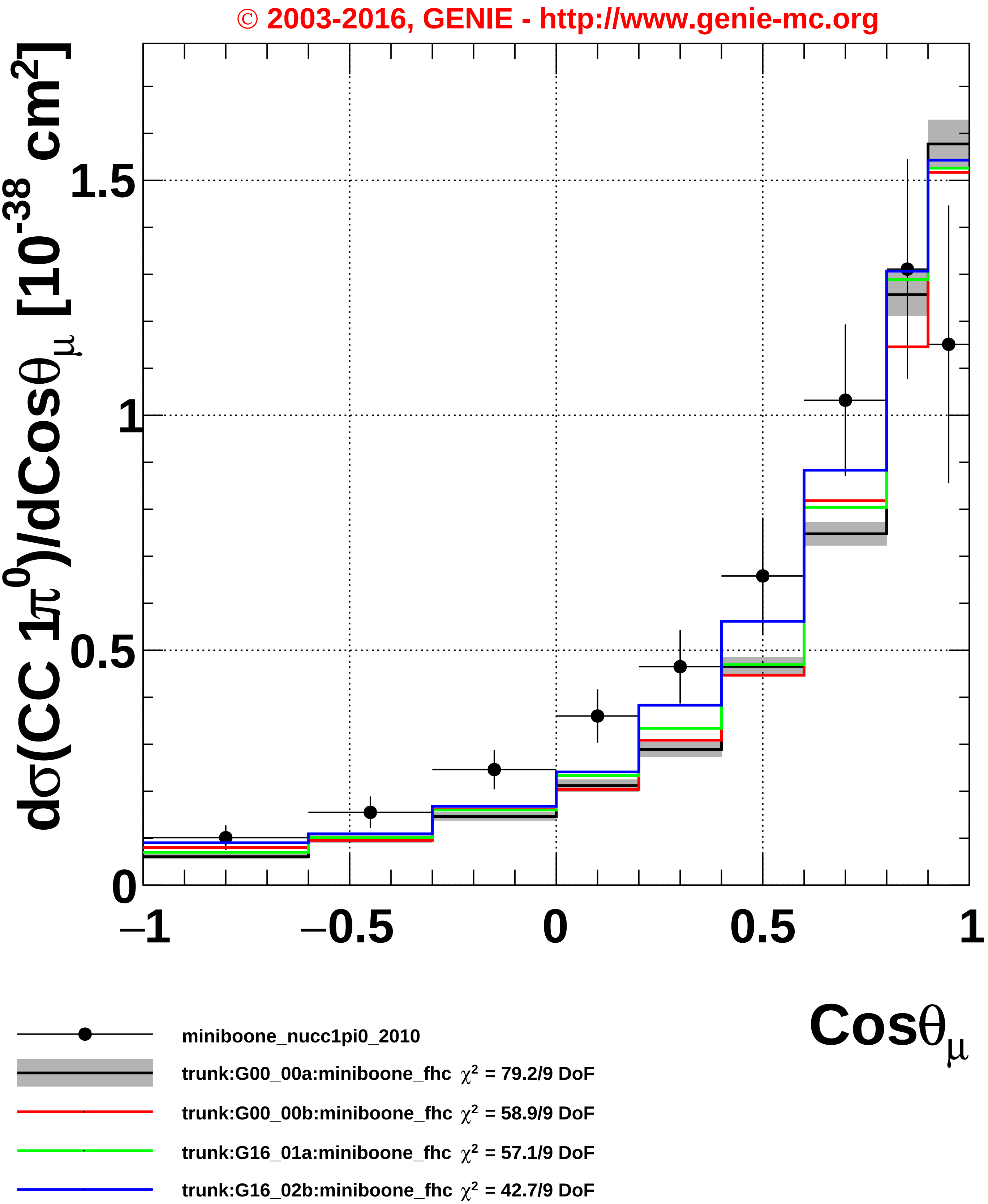
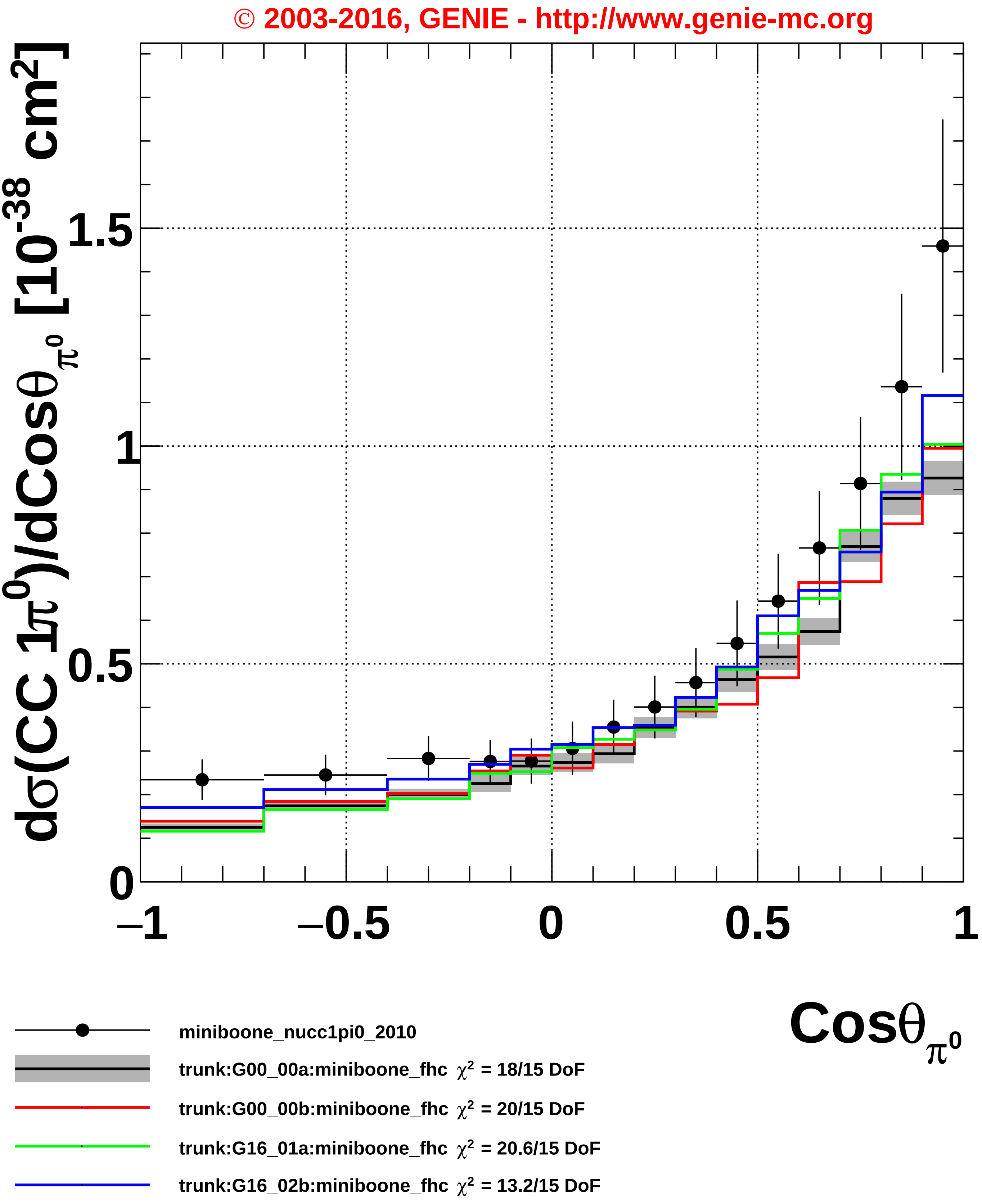
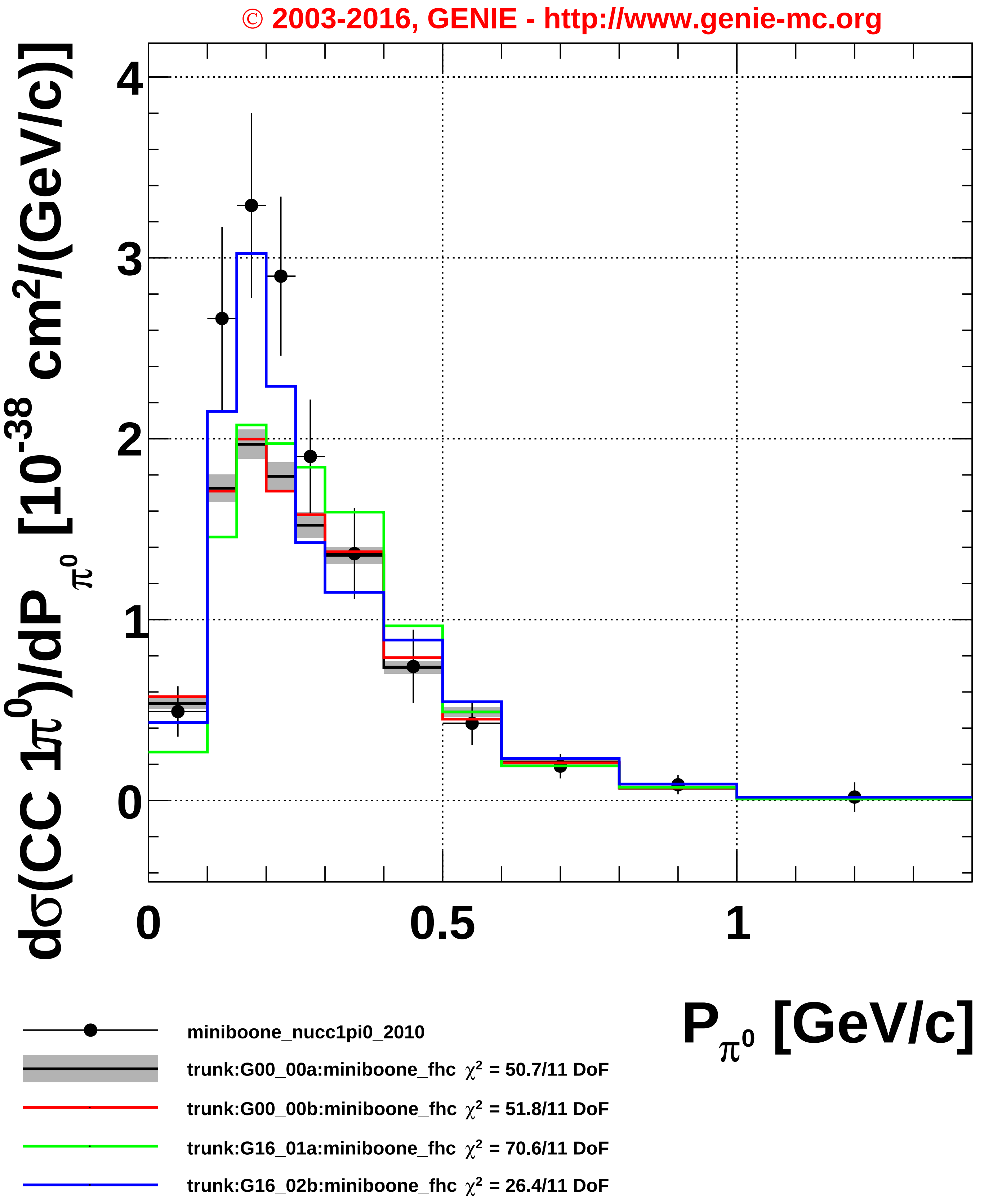

© 2003-2016, GENIE - http://www.genie-mc.org
σ(ν_μ+X → μ⁻+π⁰+Y) [10⁻³⁸ cm²]
0
1
2
3
0.5
1
1.5
2
E_ν [GeV]
miniboone_nucc1pi0_2010
trunk:G00_00a:miniboone_fhc χ² = 25.4/14 DoF
trunk:G00_00b:miniboone_fhc χ² = 14.3/14 DoF
trunk:G16_01a:miniboone_fhc χ² = 12.1/14 DoF
trunk:G16_02b:miniboone_fhc χ² = 21.9/14 DoF



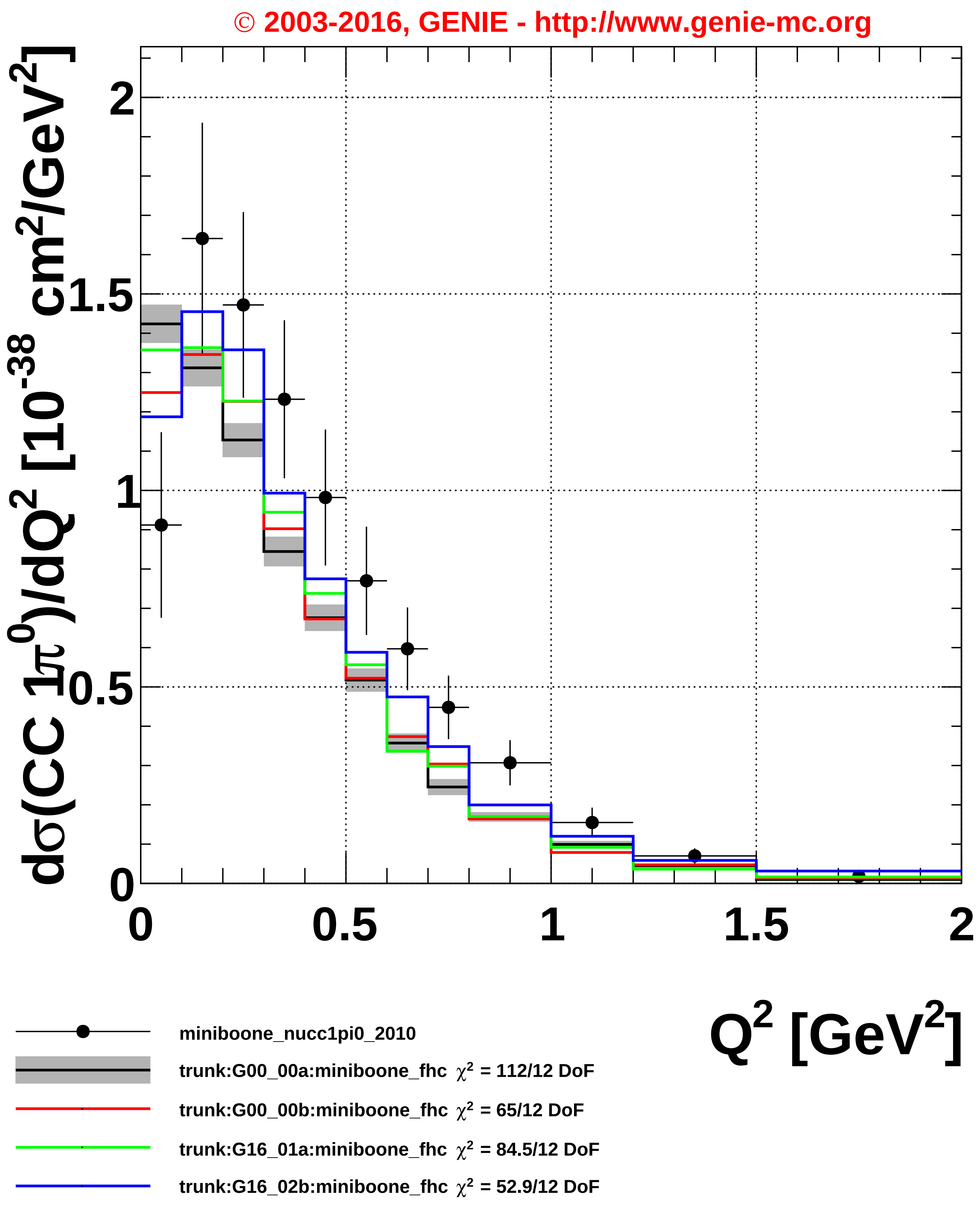
© 2003-2016, GENIE - http://www.genie-mc.org
dσ(CC 1π⁰)/dCosθμ [10⁻³⁸ cm²]
0
0.5
1
1.5
–1
–0.5
0
0.5
1
Cosθμ
miniboone_nucc1pi0_2010
trunk:G00_00a:miniboone_fhc χ² = 79.2/9 DoF
trunk:G00_00b:miniboone_fhc χ² = 58.9/9 DoF
trunk:G16_01a:miniboone_fhc χ² = 57.1/9 DoF
trunk:G16_02b:miniboone_fhc χ² = 42.7/9 DoF

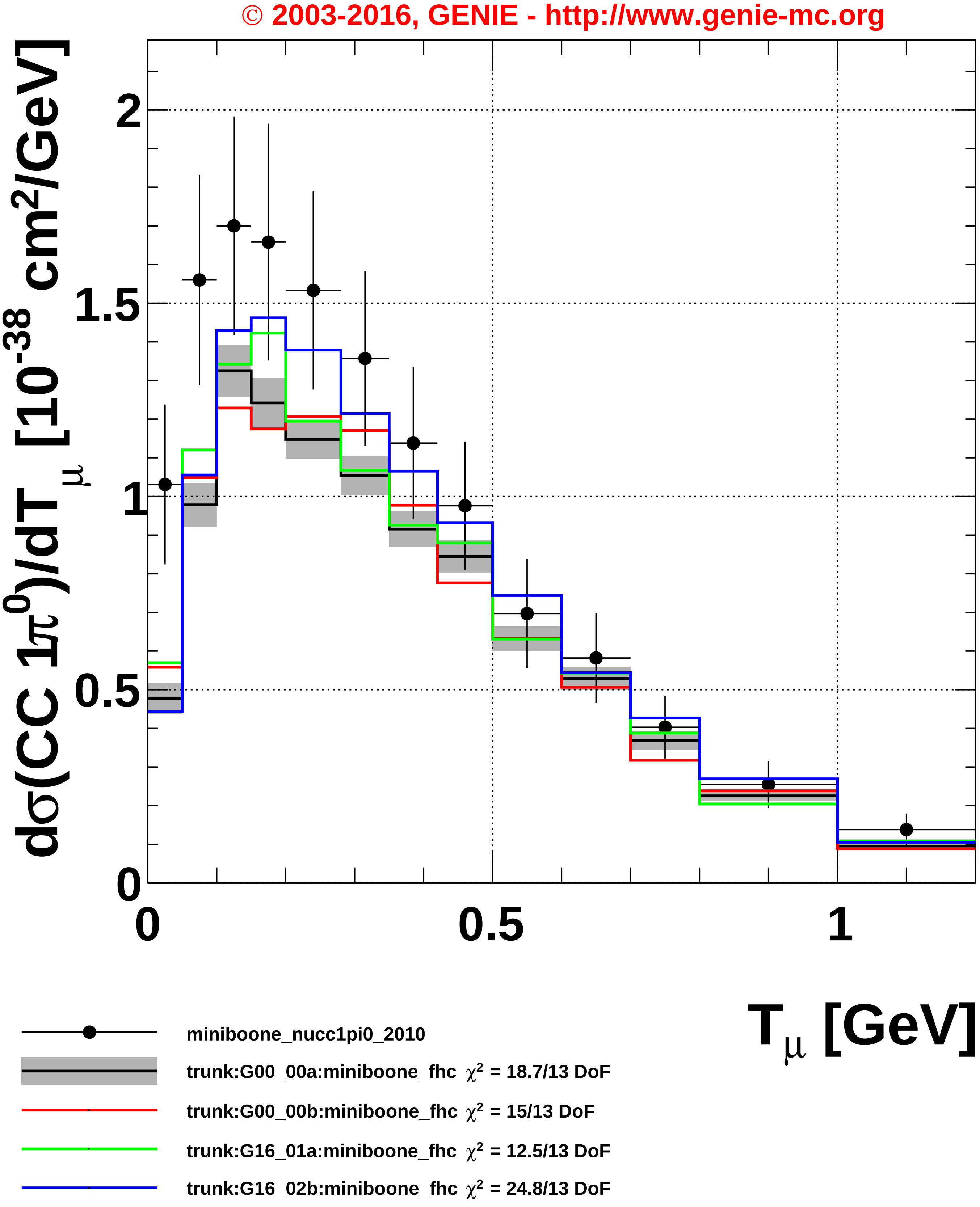


© 2003-2016, GENIE - http://www.genie-mc.org
dσ(CC 1π⁰)/dCosθ_π⁰ [10⁻³⁸ cm²]
Cosθ_π⁰
0
0.5
1
1.5
–1
–0.5
0
0.5
1
miniboone_nucc1pi0_2010
trunk:G00_00a:miniboone_fhc χ² = 18/15 DoF
trunk:G00_00b:miniboone_fhc χ² = 20/15 DoF
trunk:G16_01a:miniboone_fhc χ² = 20.6/15 DoF
trunk:G16_02b:miniboone_fhc χ² = 13.2/15 DoF



© 2003-2016, GENIE - http://www.genie-mc.org
dσ(CC 1π0)/dP_π0 [10^-38 cm^2/(GeV/c)]
P_π0 [GeV/c]
0
1
2
3
4
0.5
miniboone_nucc1pi0_2010
trunk:G00_00a:miniboone_fhc χ2 = 50.7/11 DoF
trunk:G00_00b:miniboone_fhc χ2 = 51.8/11 DoF
trunk:G16_01a:miniboone_fhc χ2 = 70.6/11 DoF
trunk:G16_02b:miniboone_fhc χ2 = 26.4/11 DoF


© 2003-2016, GENIE - http://www.genie-mc.org
$d\sigma(CC\ 1\pi^0)/dQ^2\ [10^{-38}\ cm^2/GeV^2]$
$Q^2\ [GeV^2]$
miniboone_nucc1pi0_2010
trunk:G00_00a:miniboone_fhc χ^2 = 112/12 DoF
trunk:G00_00b:miniboone_fhc χ^2 = 65/12 DoF
trunk:G16_01a:miniboone_fhc χ^2 = 84.5/12 DoF
trunk:G16_02b:miniboone_fhc χ^2 = 52.9/12 DoF

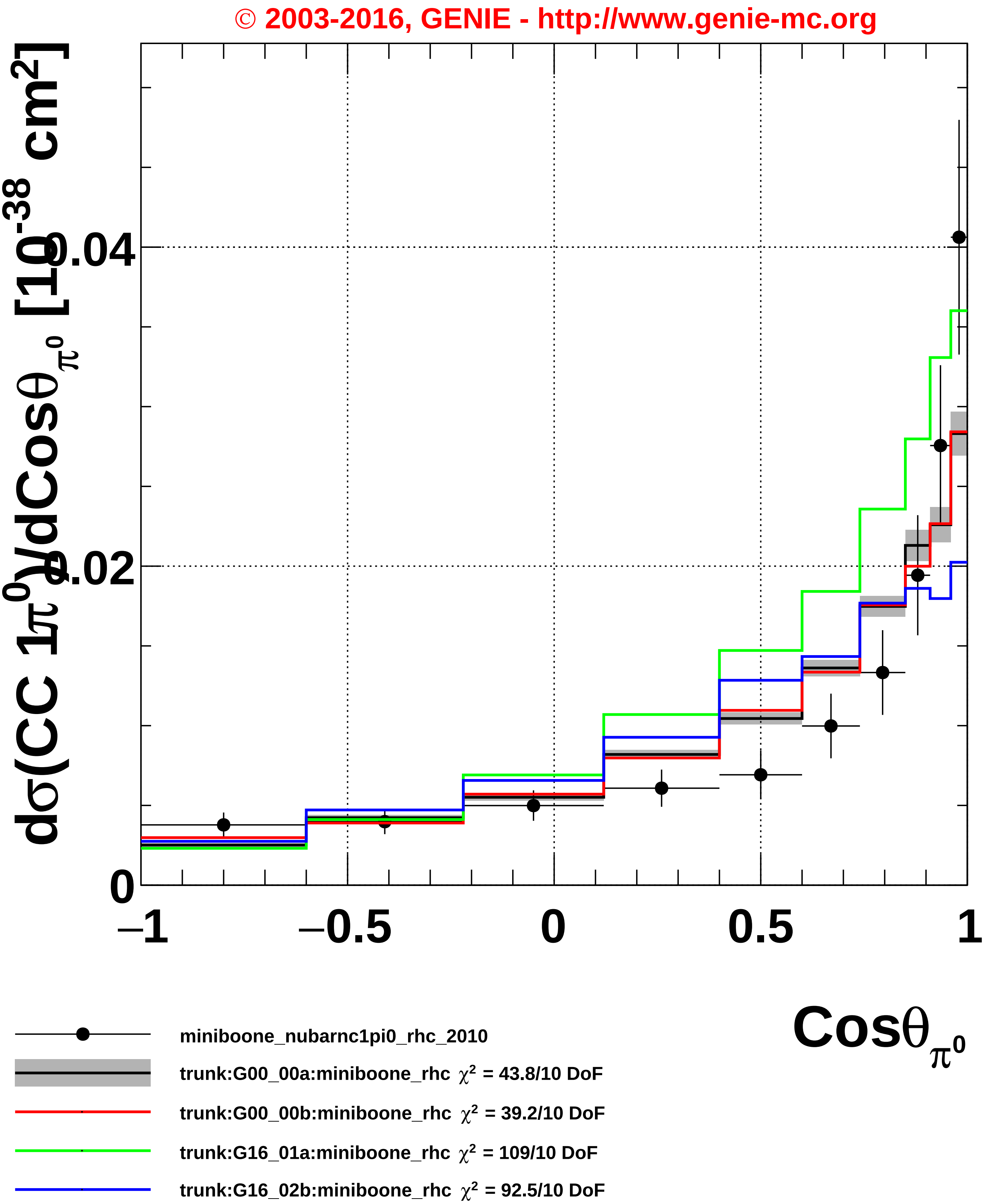

© 2003-2016, GENIE - http://www.genie-mc.org
dσ(CC 1π0)/dTμ [10-38 cm2/GeV]
0
0.5
1
1.5
2
0
0.5
1
Tμ [GeV]
miniboone_nucc1pi0_2010
trunk:G00_00a:miniboone_fhc χ2 = 18.7/13 DoF
trunk:G00_00b:miniboone_fhc χ2 = 15/13 DoF
trunk:G16_01a:miniboone_fhc χ2 = 12.5/13 DoF
trunk:G16_02b:miniboone_fhc χ2 = 24.8/13 DoF

GENIE comparisons with MiniBooNE NC $1\pi^0$ dataset

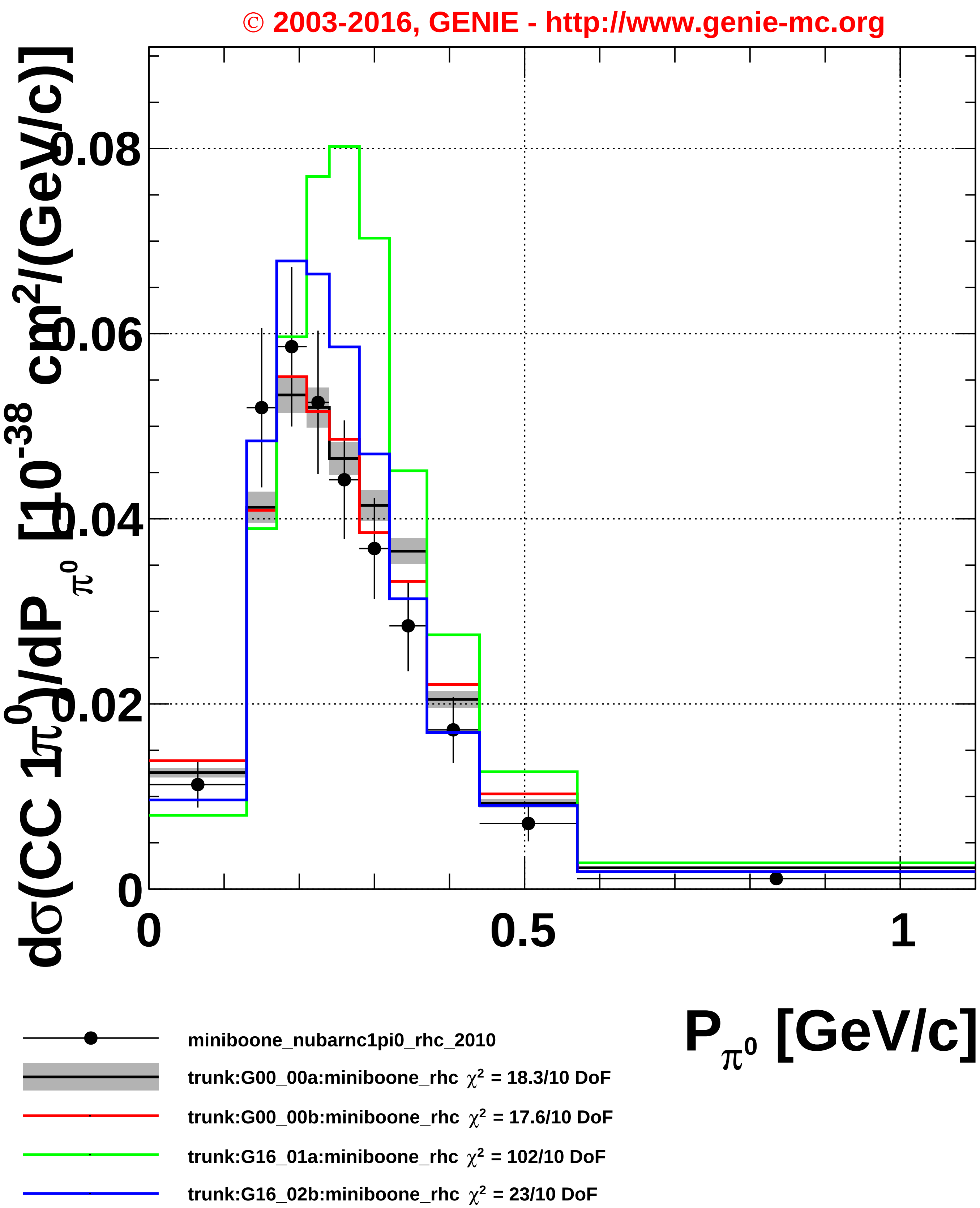
Dataset:
miniboone_nubarnc1pi0_rhc_2010

Models:
trunk/G00_00a
trunk/G00_00b
trunk/G16_01a
trunk/G16_02b

2016/11/22 12:29:30



© 2003-2016, GENIE - http://www.genie-mc.org
dσ(CC 1π0)/dCosθπ0 [10-38 cm2]
0
0.02
0.04
−1
−0.5
0
0.5
1
Cosθπ0
miniboone_nubarnc1pi0_rhc_2010
trunk:G00_00a:miniboone_rhc χ2 = 43.8/10 DoF
trunk:G00_00b:miniboone_rhc χ2 = 39.2/10 DoF
trunk:G16_01a:miniboone_rhc χ2 = 109/10 DoF
trunk:G16_02b:miniboone_rhc χ2 = 92.5/10 DoF



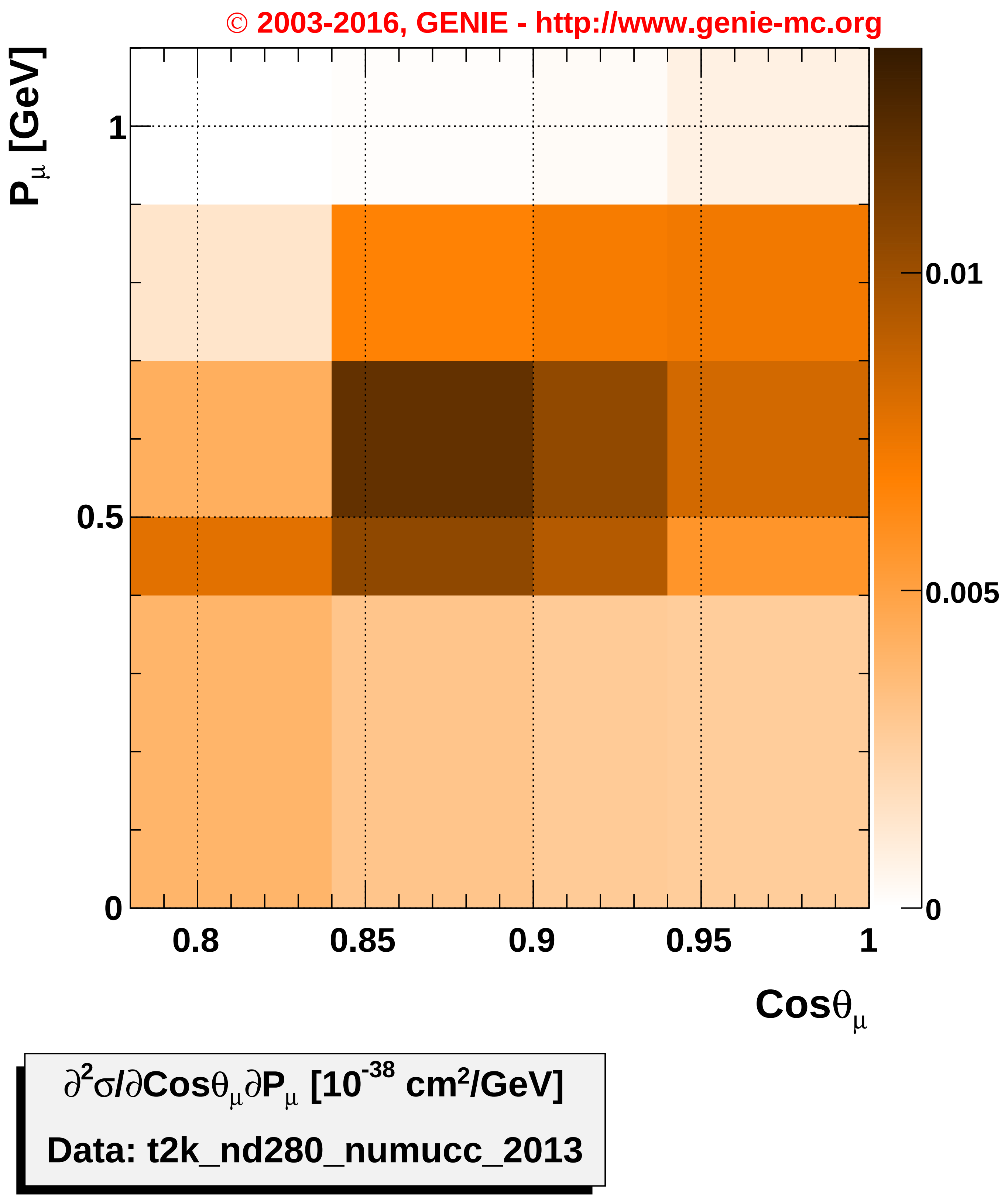
© 2003-2016, GENIE - http://www.genie-mc.org
dσ(CC 1π⁰)/dP_π⁰ [10^-38 cm²/(GeV/c)]
P_π⁰ [GeV/c]
0
0.02
0.04
0.06
0.08
0
0.5
1
miniboone_nubarnc1pi0_rhc_2010
trunk:G00_00a:miniboone_rhc χ² = 18.3/10 DoF
trunk:G00_00b:miniboone_rhc χ² = 17.6/10 DoF
trunk:G16_01a:miniboone_rhc χ² = 102/10 DoF
trunk:G16_02b:miniboone_rhc χ² = 23/10 DoF

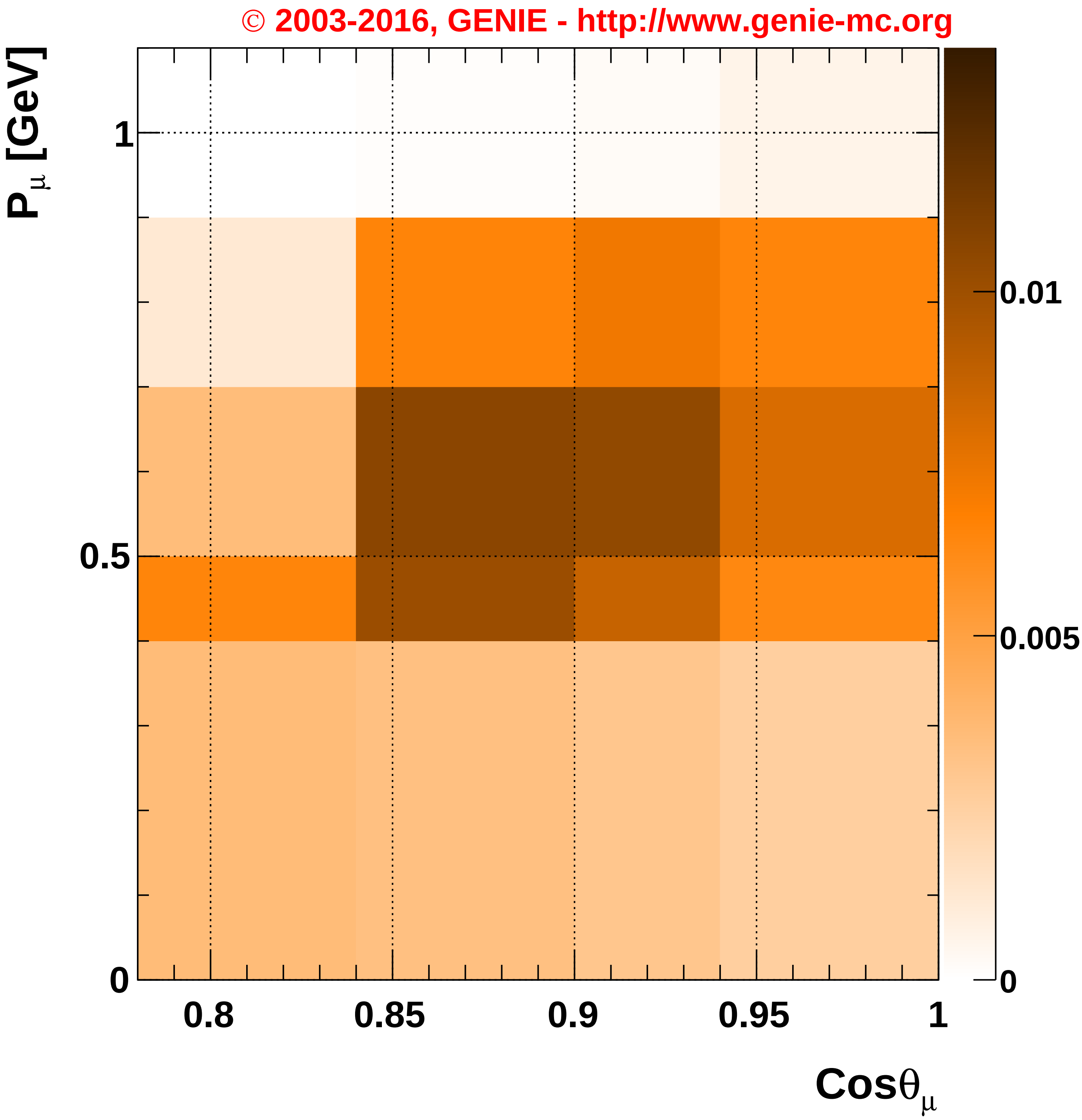
GENIE Comparisons 2013 T2K/ND280 ν_μ CC data release

Dataset:
t2k_nd280_numucc_2013

Models:
trunk/G00_00a
trunk/G00_00b
trunk/G16_01a
trunk/G16_02b

2016/11/22 12:36:53


© 2003-2016, GENIE - http://www.genie-mc.org
P_μ [GeV]
1
0.5
0
0.8
0.85
0.9
0.95
1
$Cos\theta_\mu$
0.01
0.005
0
$\partial^2\sigma/\partial Cos\theta_\mu \partial P_\mu$ [10^{-38} cm^2/GeV]
Data: t2k_nd280_numucc_2013



$\partial^2\sigma/\partial\cos\theta_\mu\partial P_\mu$ [10^{-38} cm^2/GeV]

Pred: trunk:G00_00a:t2k_nd280_numu_fhc

t2k_nd280_numucc_2013

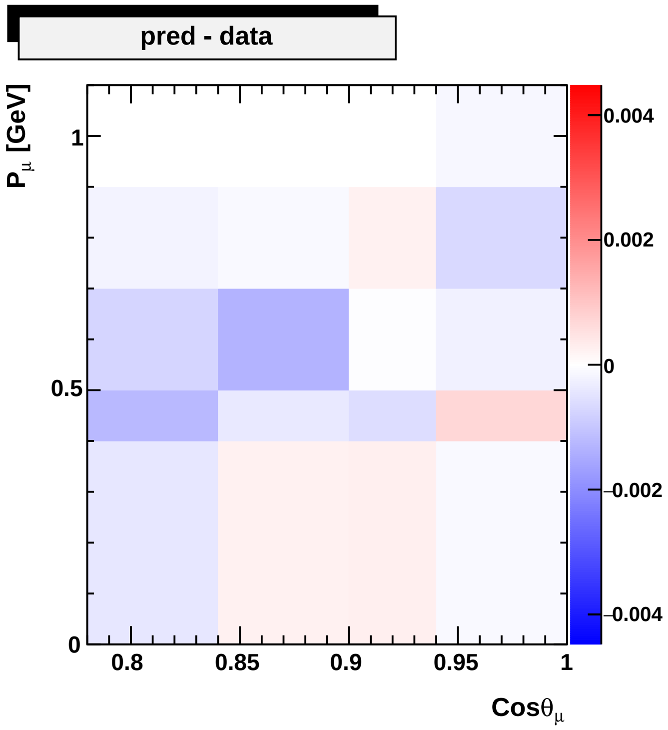
VS

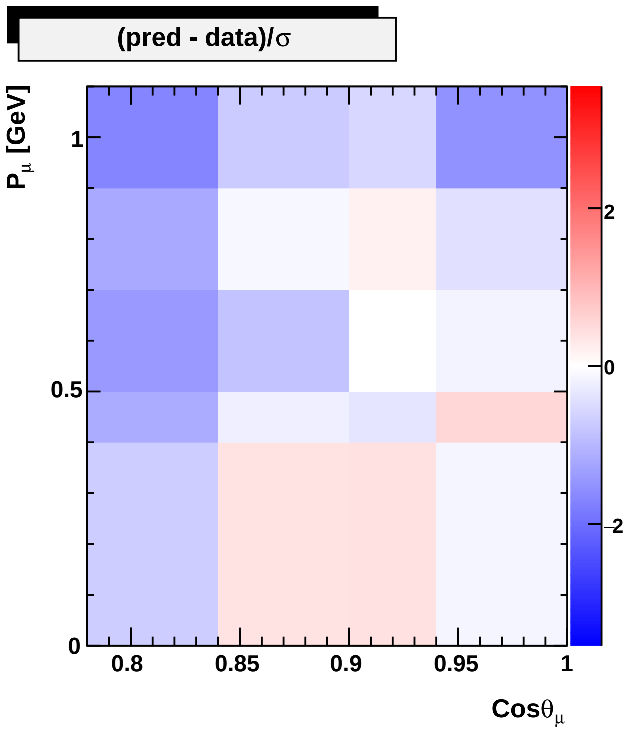
trunk:G00_00a:t2k_nd280_numu_fhc

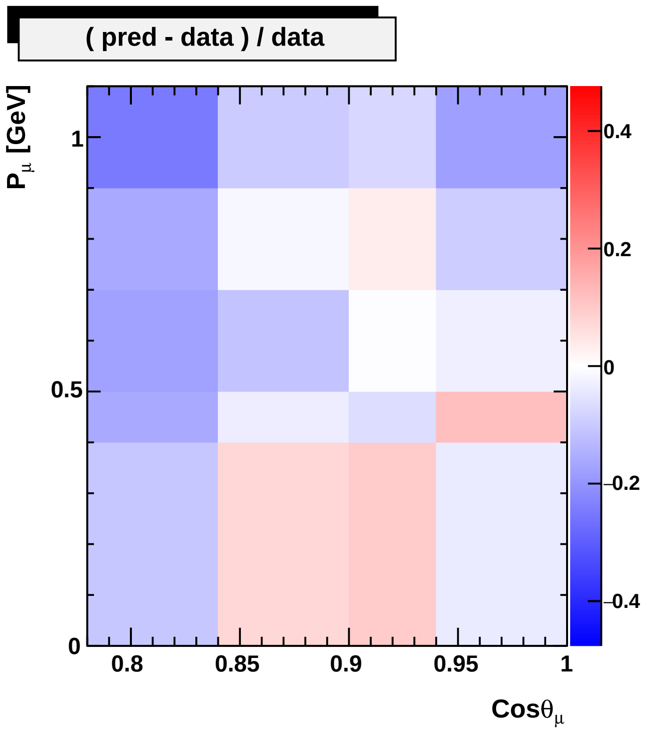
$\partial^2\sigma/\partial Cos\theta_\mu \partial P_\mu$

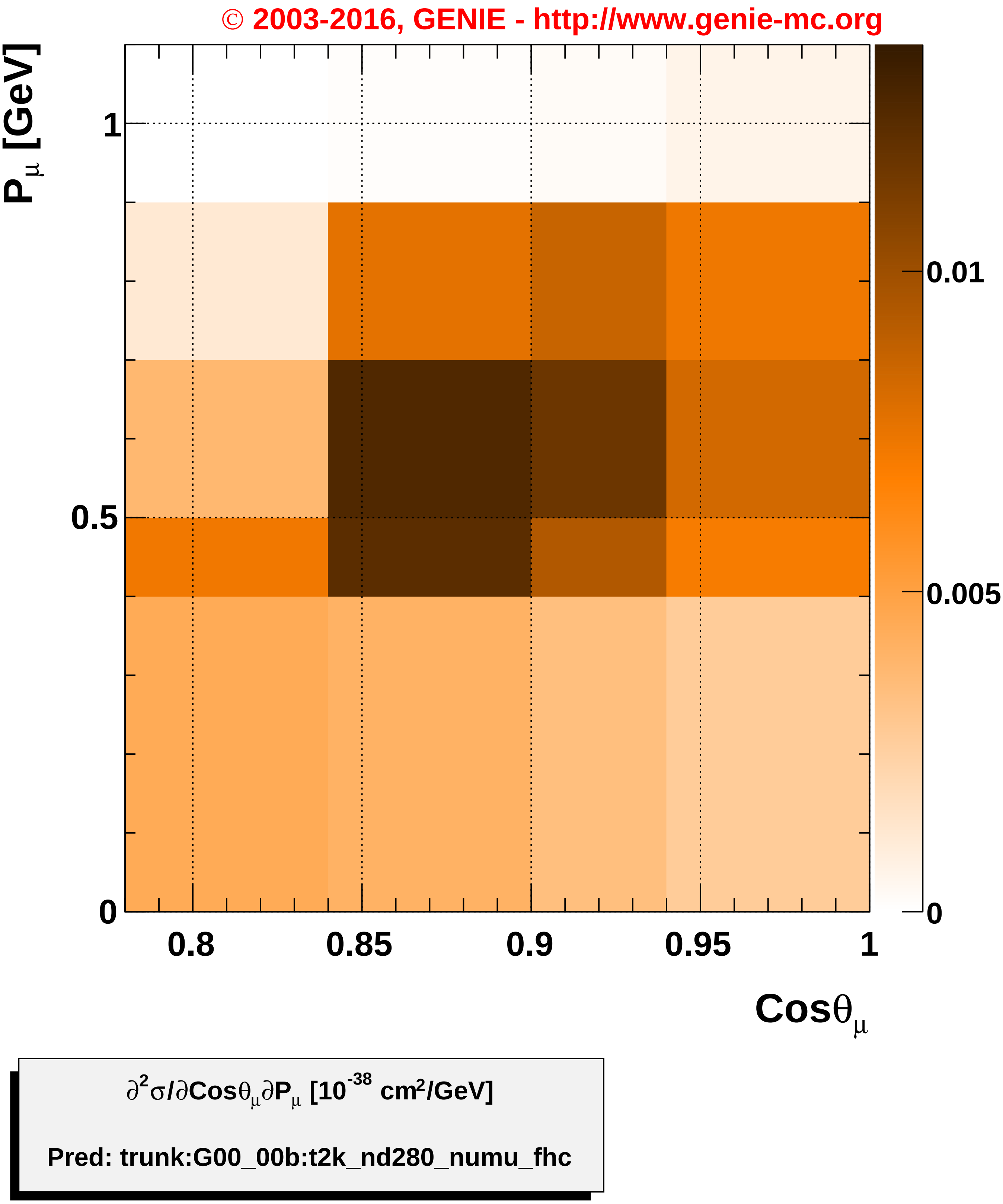
$[10^{-38}\ cm^2/GeV]$

χ^2 = 16.0399/20 DoF









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P_μ [GeV]
1
0.5
0
0.8
0.85
0.9
0.95
1
$Cos\theta_\mu$
0.01
0.005
0
$\partial^2\sigma/\partial Cos\theta_\mu \partial P_\mu$ [10^{-38} cm^2/GeV]
Pred: trunk:G00_00b:t2k_nd280_numu_fhc

t2k_nd280_numucc_2013

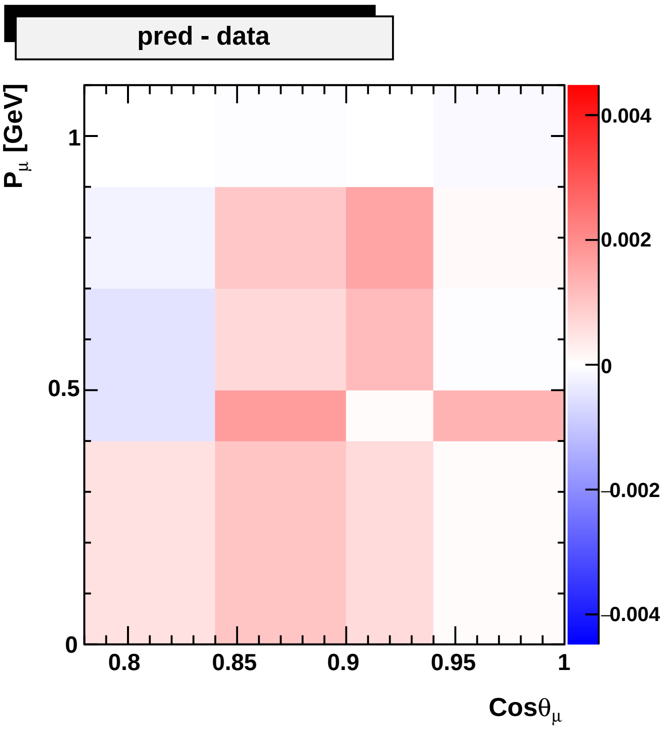
VS

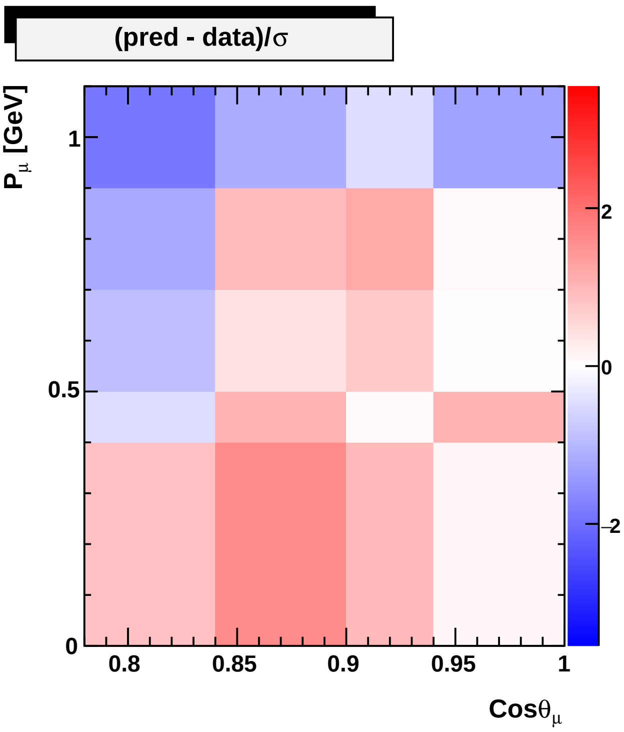
trunk:G00_00b:t2k_nd280_numu_fhc

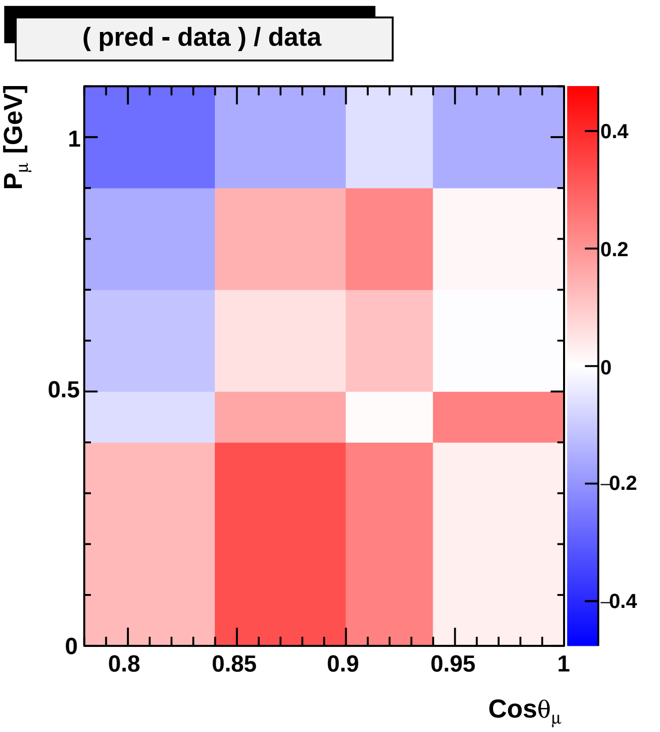
$\partial^2\sigma/\partial Cos\theta_\mu \partial P_\mu$

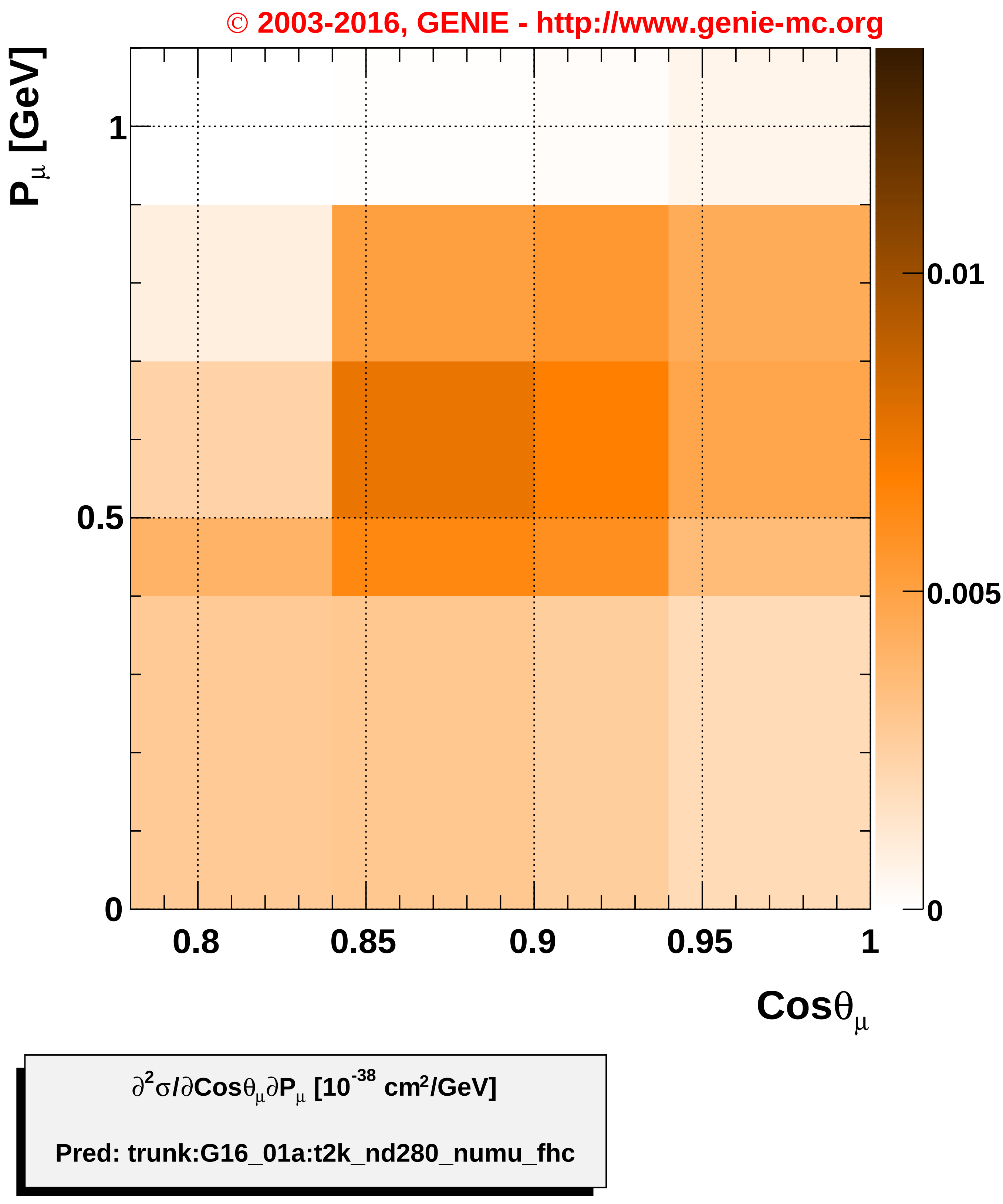
$[10^{-38}\ cm^2/GeV]$

χ^2 = 37.0471/20 DoF








© 2003-2016, GENIE - http://www.genie-mc.org
P_μ [GeV]
1
0.5
0
0.8
0.85
0.9
0.95
1
Cosθ_μ
0.01
0.005
0
∂²σ/∂Cosθ_μ∂P_μ [10^-38 cm²/GeV]
Pred: trunk:G16_01a:t2k_nd280_numu_fhc

t2k_nd280_numucc_2013

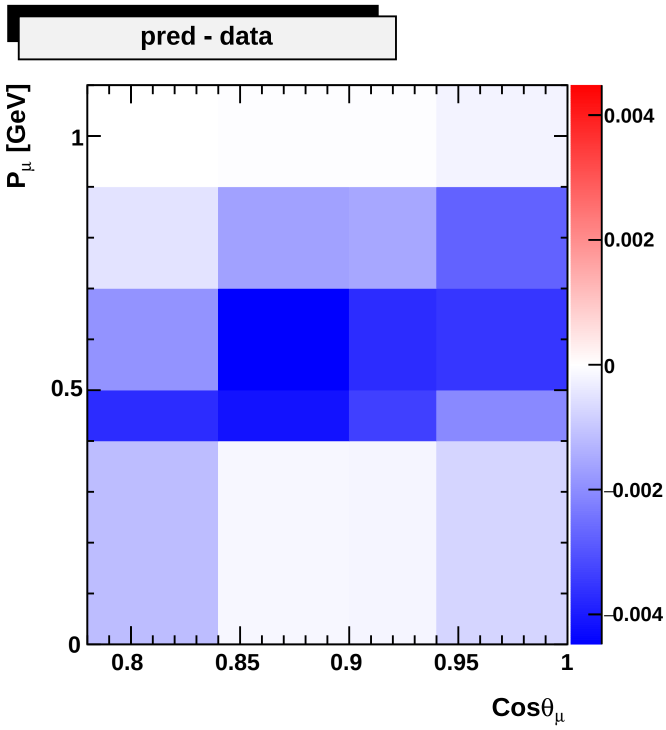
VS

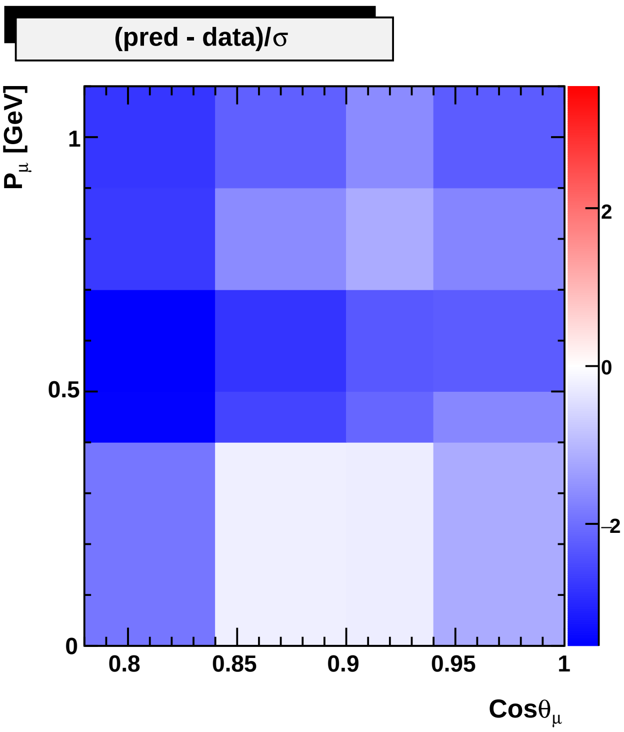
trunk:G16_01a:t2k_nd280_numu_fhc

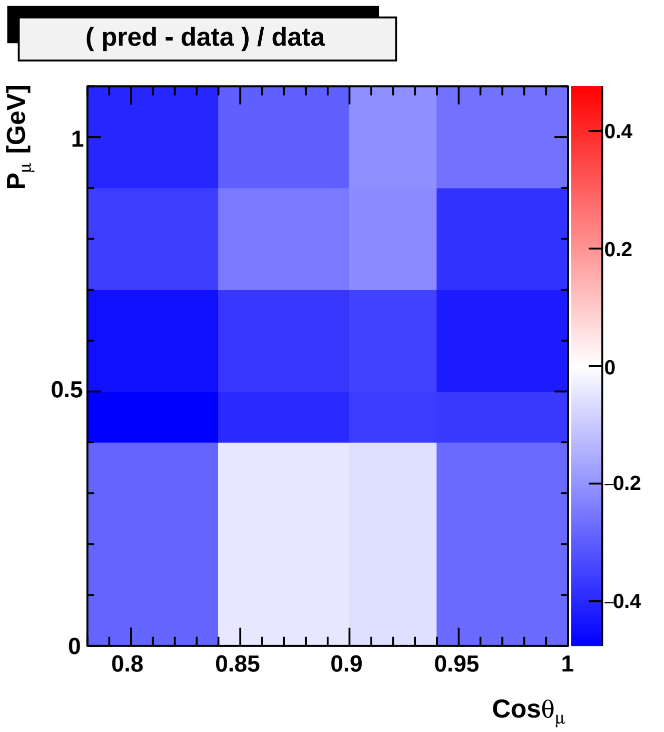
$\partial^2\sigma/\partial \mathrm{Cos}\theta_\mu \partial P_\mu$

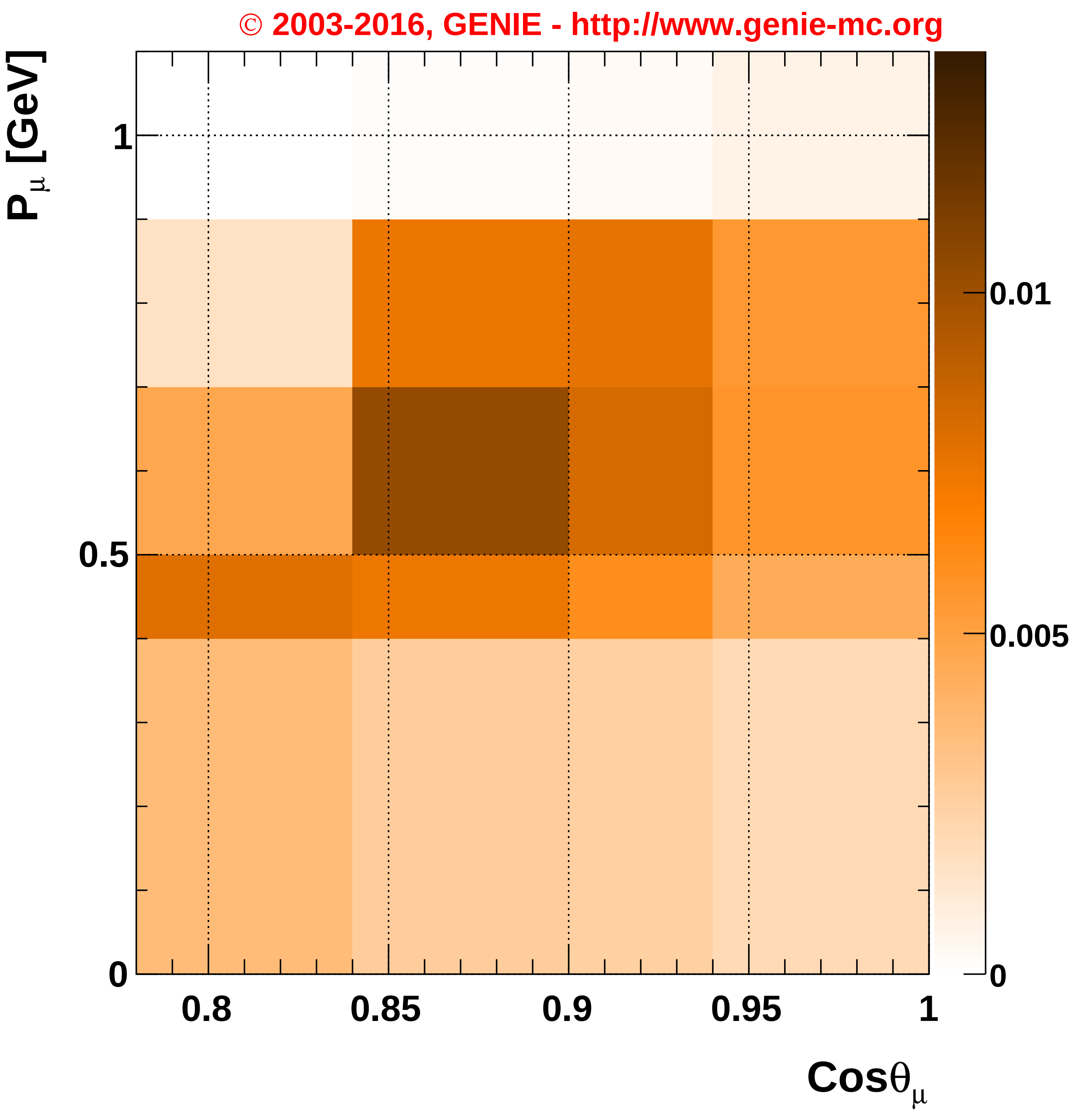
$[10^{-38}\ \mathrm{cm}^2/\mathrm{GeV}]$

χ^2 = 29.2582/20 DoF









$\partial^{2}\sigma/\partial Cos\theta_{\mu}\partial P_{\mu}$ [10^{-38} cm^{2}/GeV]

Pred: trunk:G16_02b:t2k_nd280_numu_fhc

t2k_nd280_numucc_2013

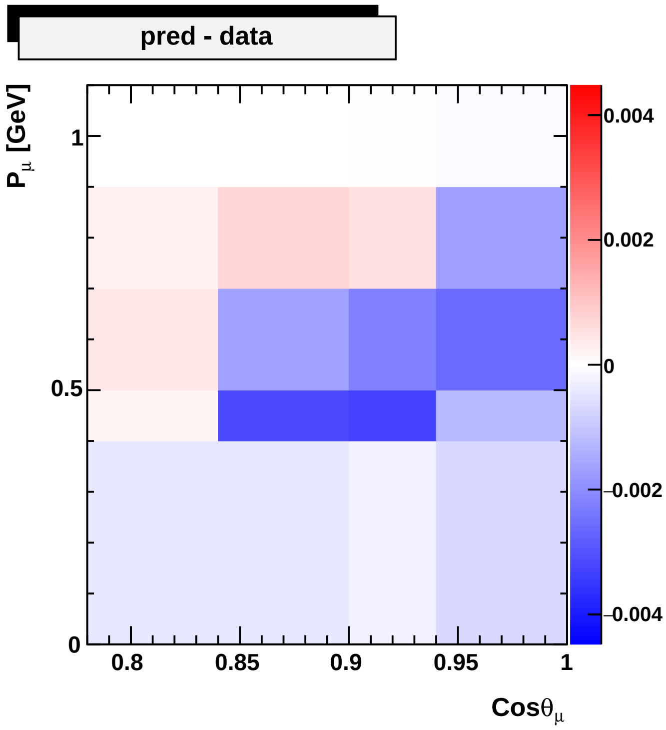
VS

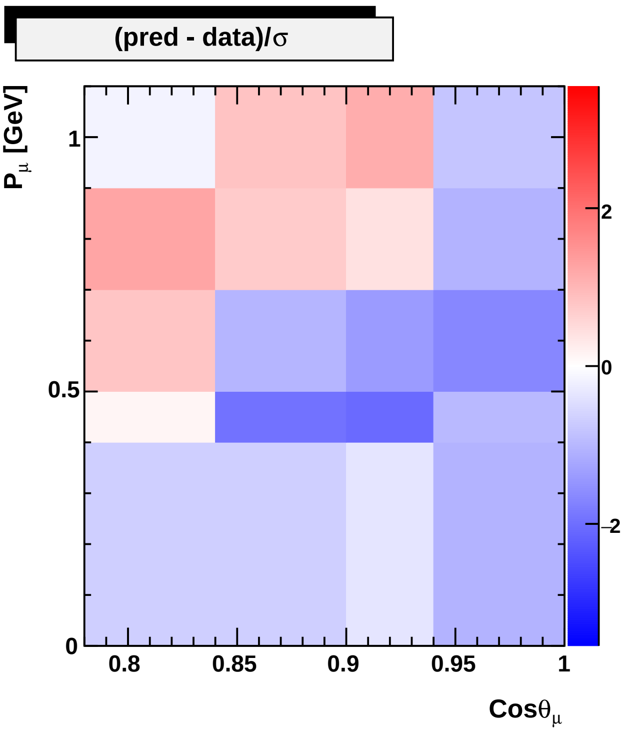
trunk:G16_02b:t2k_nd280_numu_fhc

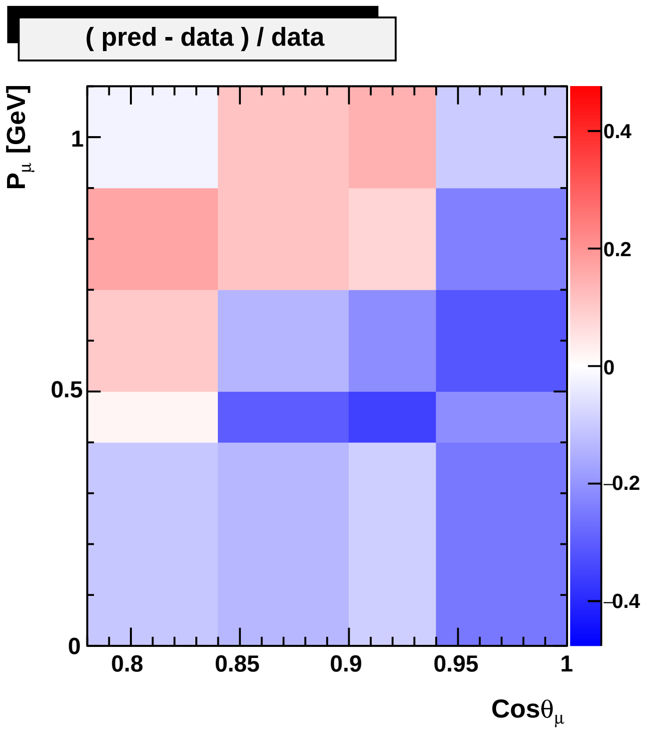
$\partial^2\sigma/\partial Cos\theta_\mu \partial P_\mu$

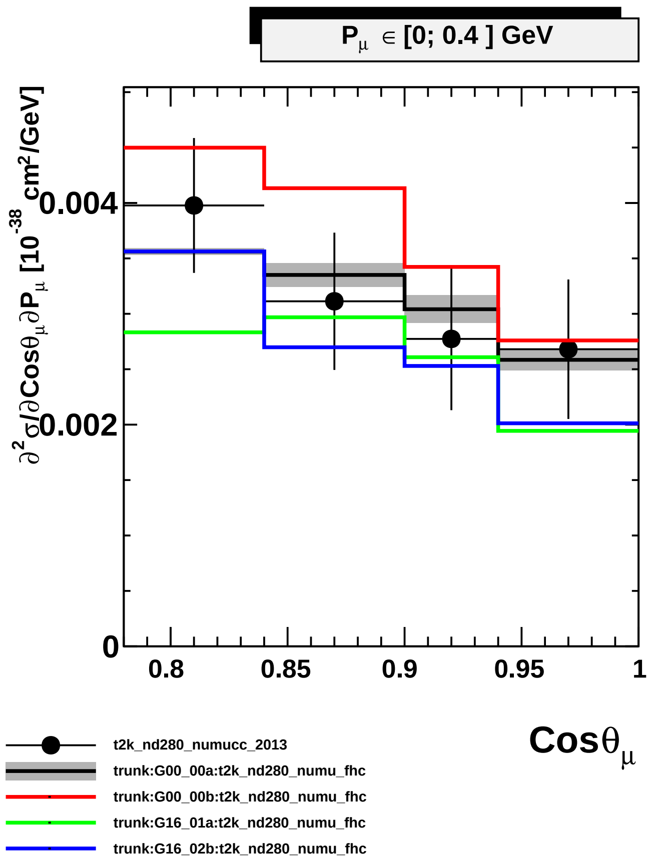
$[10^{-38}\ cm^2/GeV]$

χ^2 = 51.3192/20 DoF

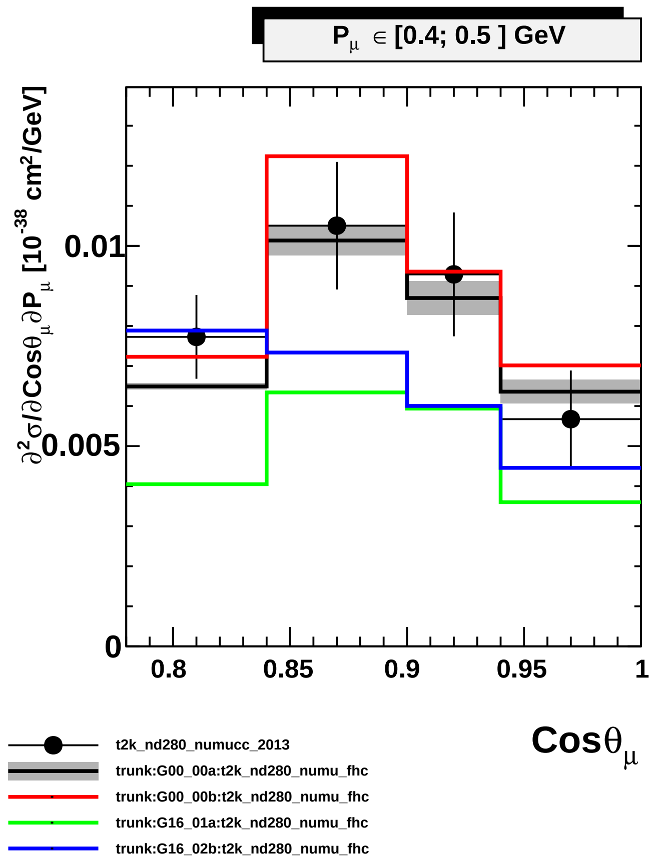




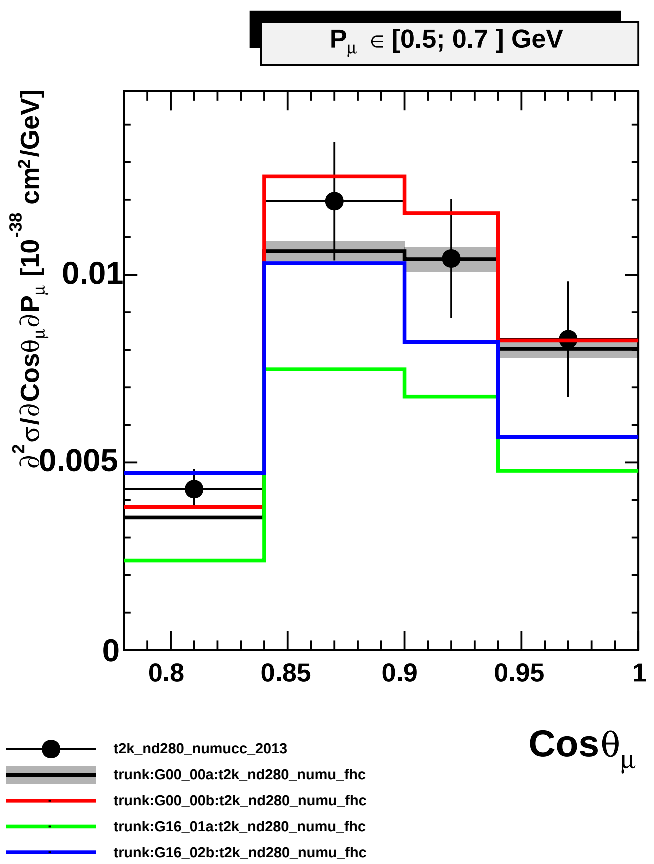




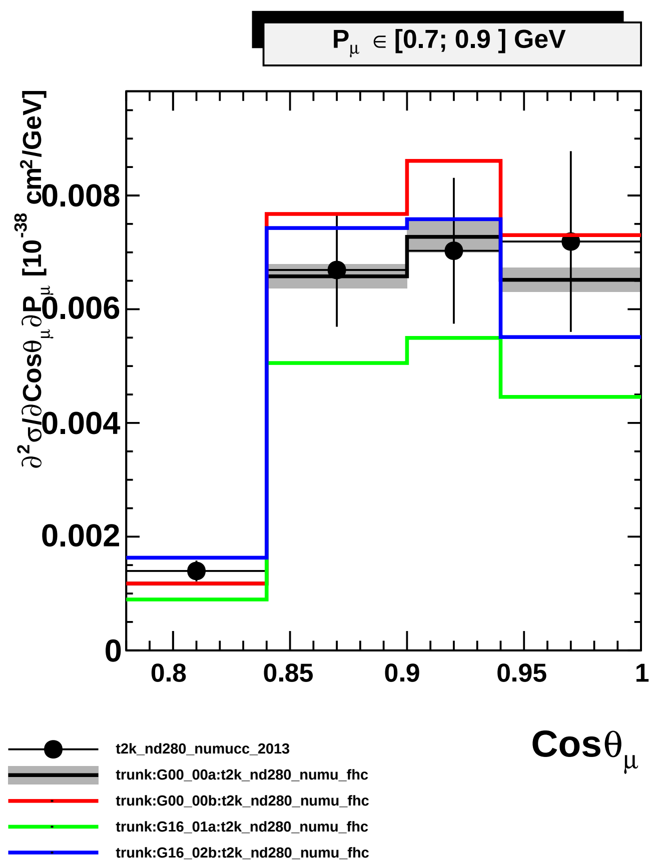
$P_\mu \in [0; 0.4]$ GeV
$\partial^2\sigma/\partial Cos\theta_\mu \partial P_\mu$ [10^{-38} cm^2/GeV]
0
0.002
0.004
0.8
0.85
0.9
0.95
1
$Cos\theta_\mu$
t2k_nd280_numucc_2013
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc



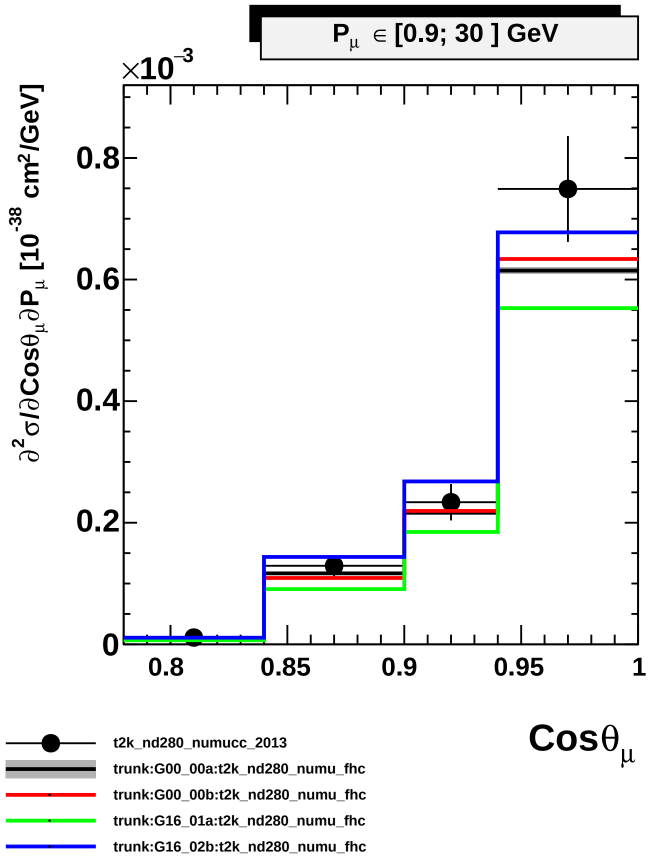
$P_\mu \in [0.4; 0.5]$ GeV
$\partial^2\sigma/\partial Cos\theta_\mu \partial P_\mu$ [10^{-38} cm^2/GeV]
0
0.005
0.01
0.8
0.85
0.9
0.95
1
$Cos\theta_\mu$
t2k_nd280_numucc_2013
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc



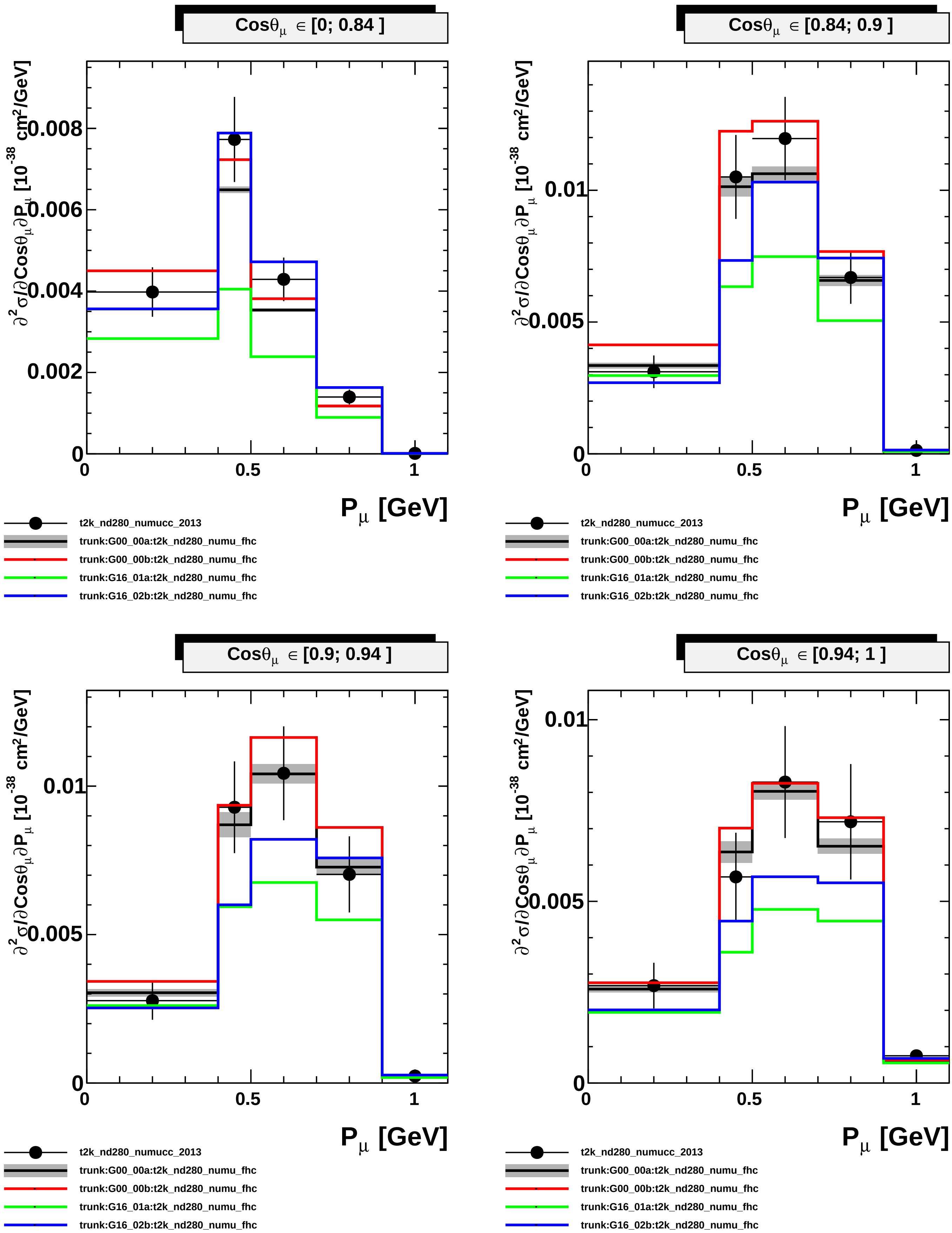
$P_\mu \in [0.5; 0.7]$ GeV
$\partial^2\sigma/\partial Cos\theta_\mu \partial P_\mu$ [10^{-38} cm^2/GeV]
0
0.005
0.01
0.8
0.85
0.9
0.95
1
$Cos\theta_\mu$
t2k_nd280_numucc_2013
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc



$P_\mu \in [0.7; 0.9]$ GeV
$\partial^2\sigma/\partial Cos\theta_\mu \partial P_\mu$ [10^{-38} cm^2/GeV]
0
0.002
0.004
0.006
0.008
0.8
0.85
0.9
0.95
1
$Cos\theta_\mu$
t2k_nd280_numucc_2013
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc



P_μ ∈ [0.9; 30] GeV
×10^-3
∂²σ/∂Cosθ_μ∂P_μ [10^-38 cm²/GeV]
0
0.2
0.4
0.6
0.8
0.8
0.85
0.9
0.95
1
Cosθ_μ
t2k_nd280_numucc_2013
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc



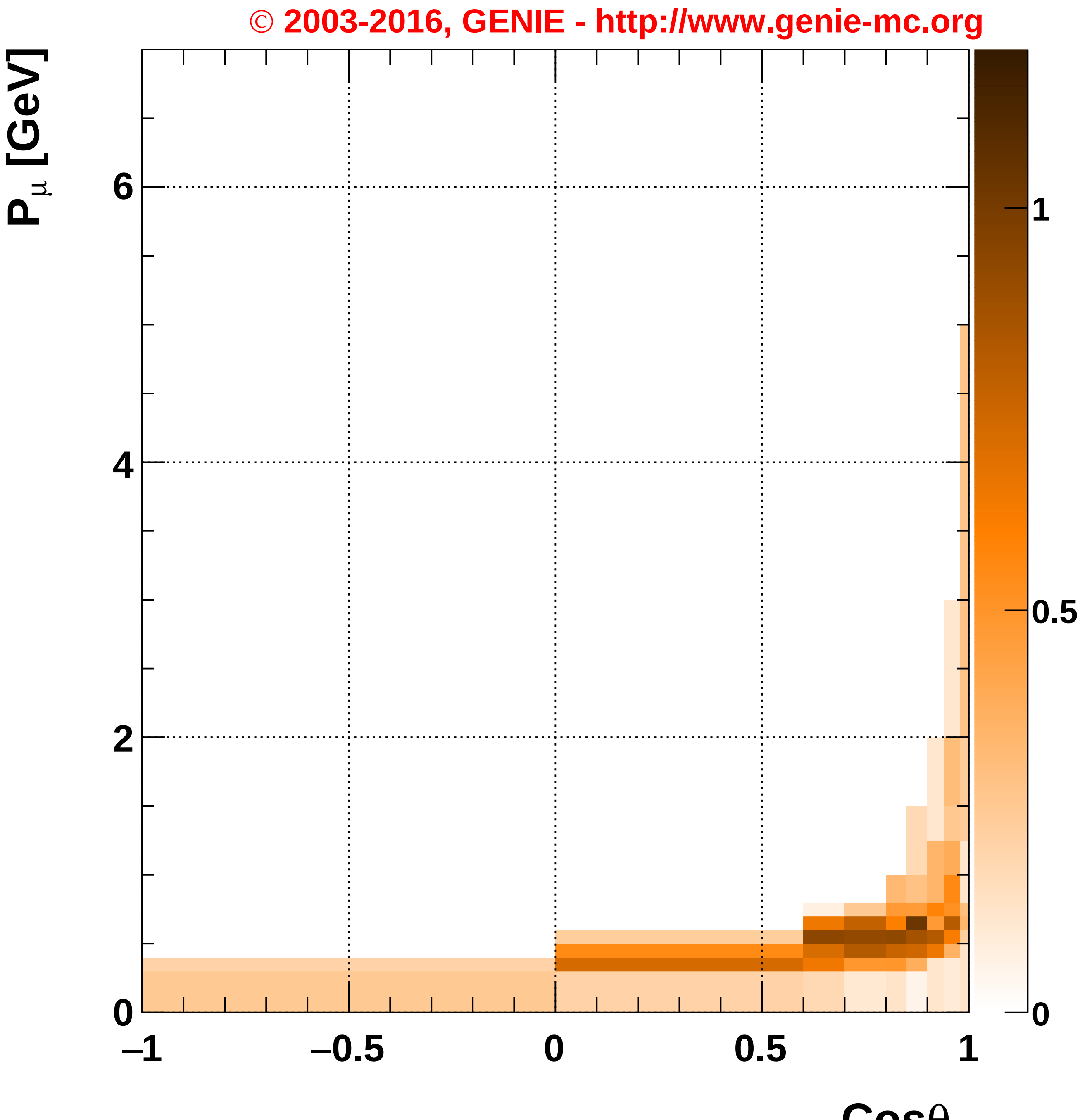
$Cos\theta_\mu \in [0; 0.84]$
$Cos\theta_\mu \in [0.84; 0.9]$
$Cos\theta_\mu \in [0.9; 0.94]$
$Cos\theta_\mu \in [0.94; 1]$
$\partial^2\sigma/\partial Cos\theta_\mu \partial P_\mu$ [10^{-38} cm^2/GeV]
P_μ [GeV]
t2k_nd280_numucc_2013
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc

GENIE comparisons with T2K/ND280 CC 0π dataset

Dataset:
t2k_nd280_numucc0pi_2015

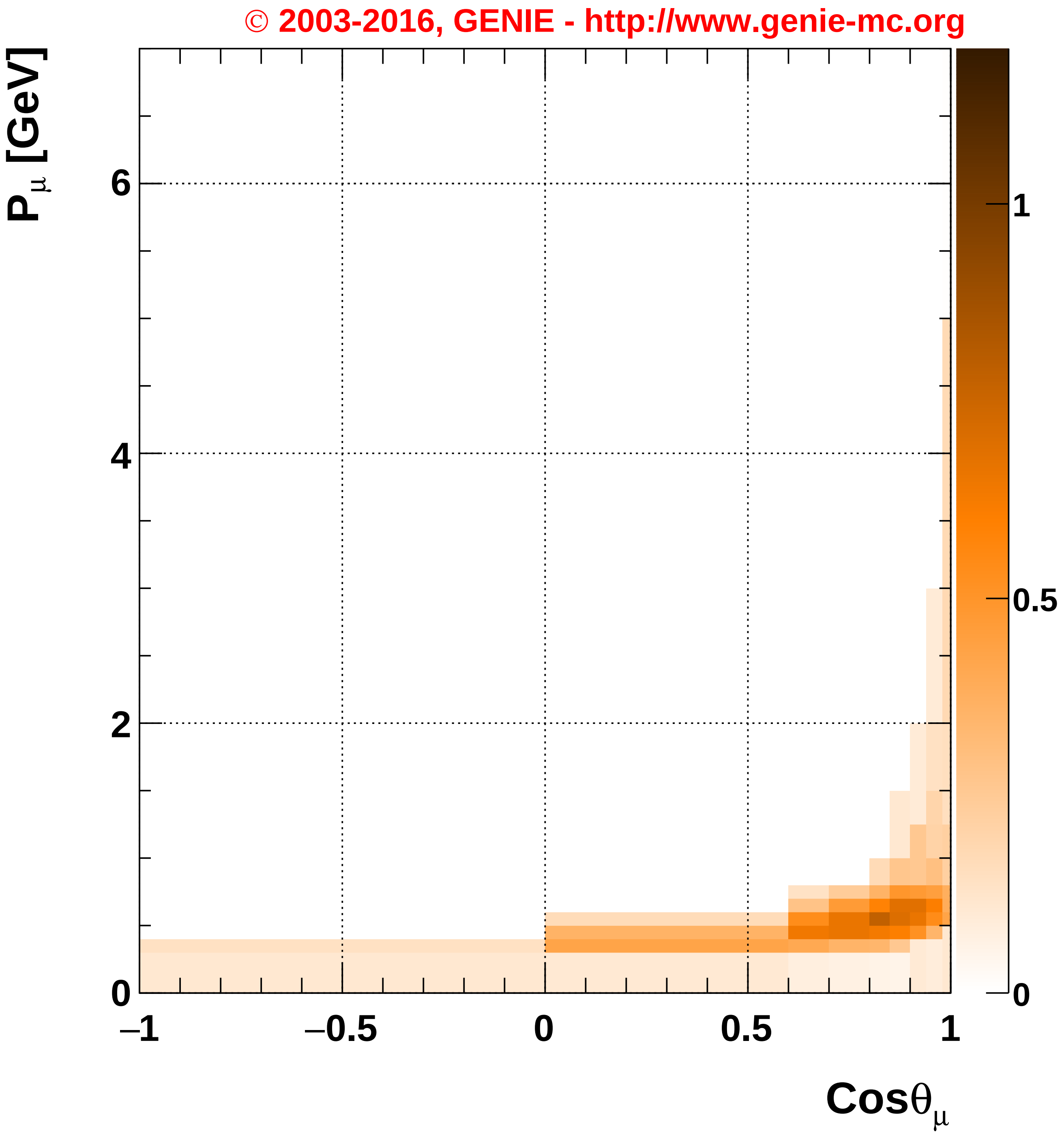
Models:
trunk/G00_00a
trunk/G00_00b
trunk/G16_01a
trunk/G16_02b

2016/11/22 12:39:47



$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$ [10^{-38} cm^2/GeV/n]

Data: t2k_nd280_numucc0pi_2015



$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$ [10^{-38} cm^2/GeV/n]

Pred: trunk:G00_00a:t2k_nd280_numu_fhc

t2k_nd280_numucc0pi_2015

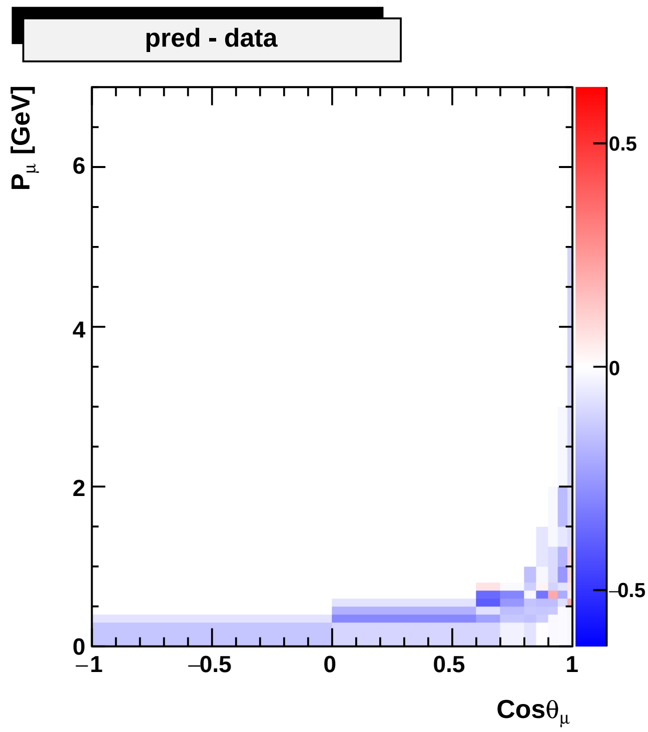
VS

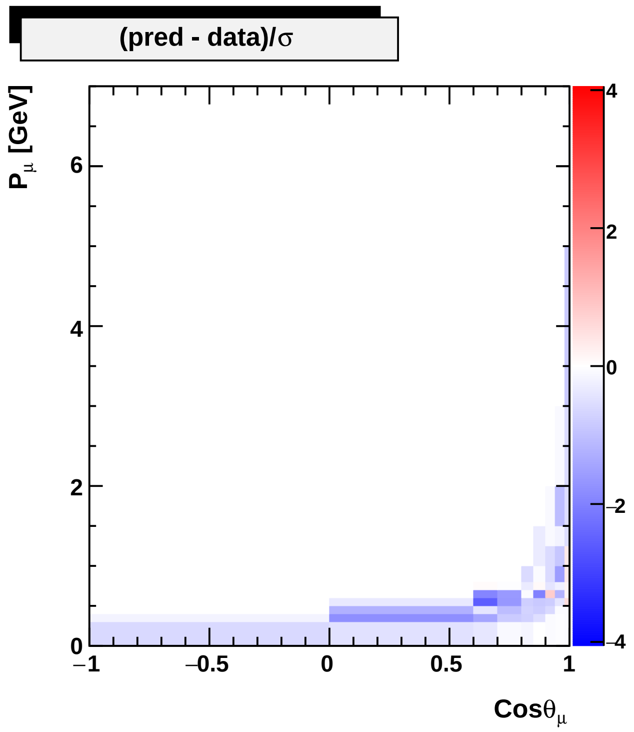
trunk:G00_00a:t2k_nd280_numu_fhc

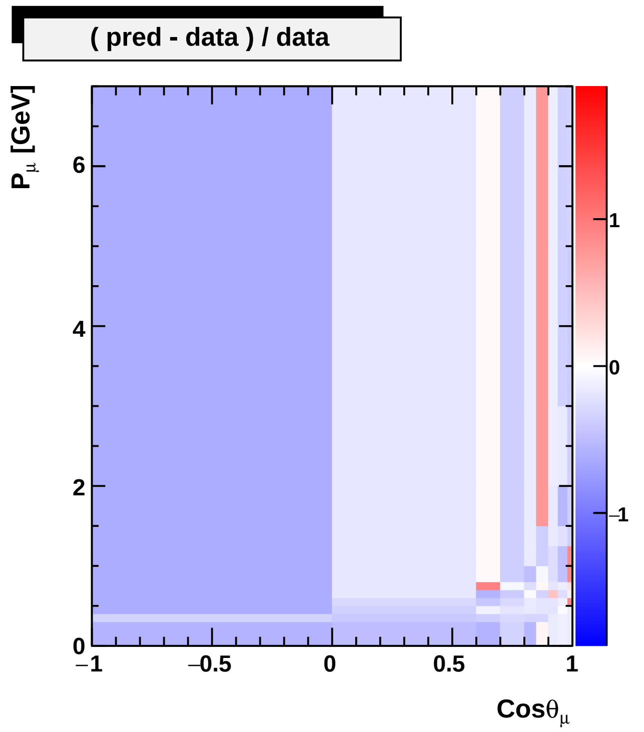
$\partial^2\sigma/\partial\mathrm{Cos}\theta_\mu/\partial P_\mu$

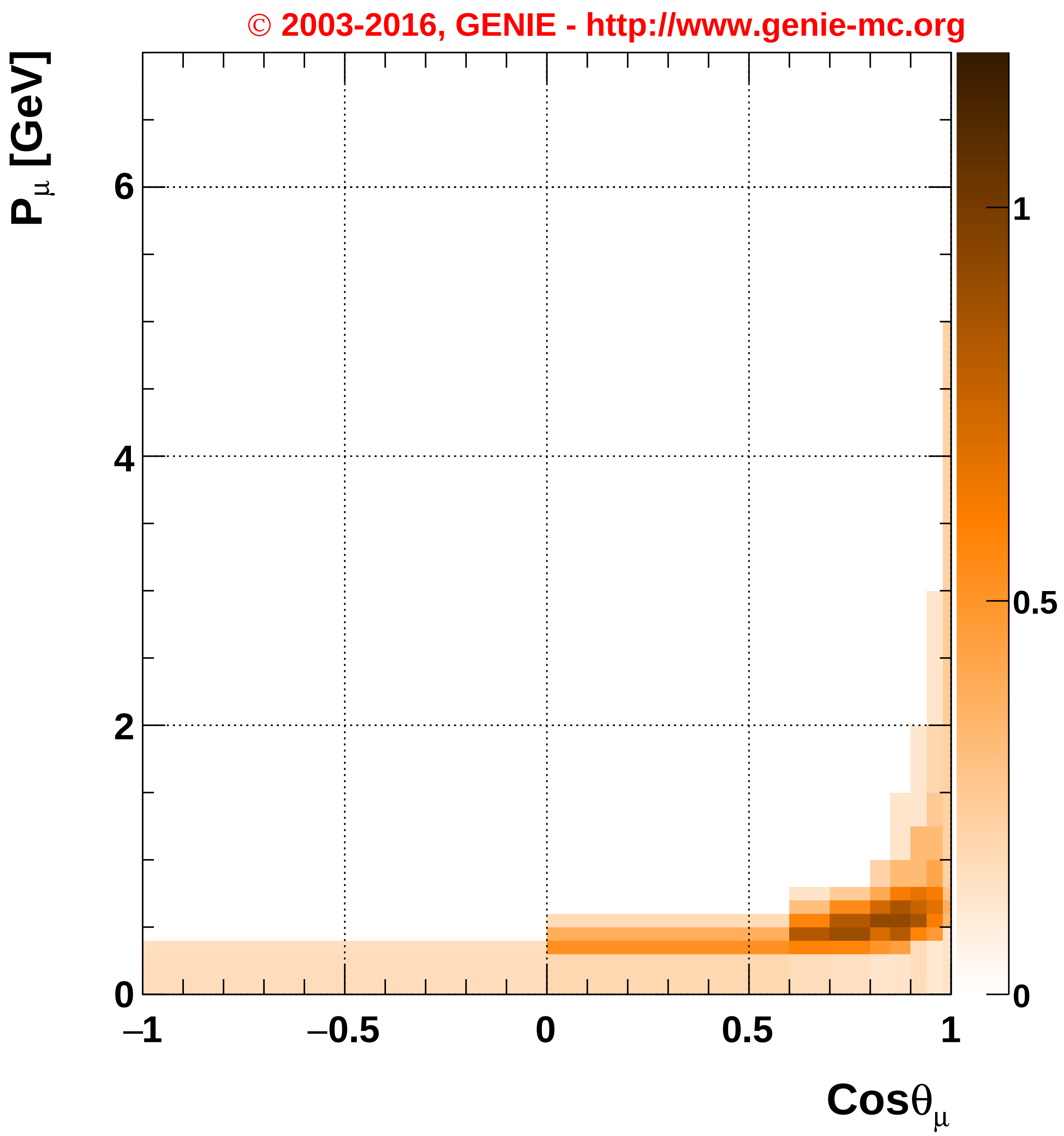
$[10^{-38}\ \mathrm{cm}^2/\mathrm{GeV/n}]$

χ^2 = 43.2258/67 DoF









$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$ [10^{-38} cm^2/GeV/n]

Pred: trunk:G00_00b:t2k_nd280_numu_fhc

t2k_nd280_numucc0pi_2015

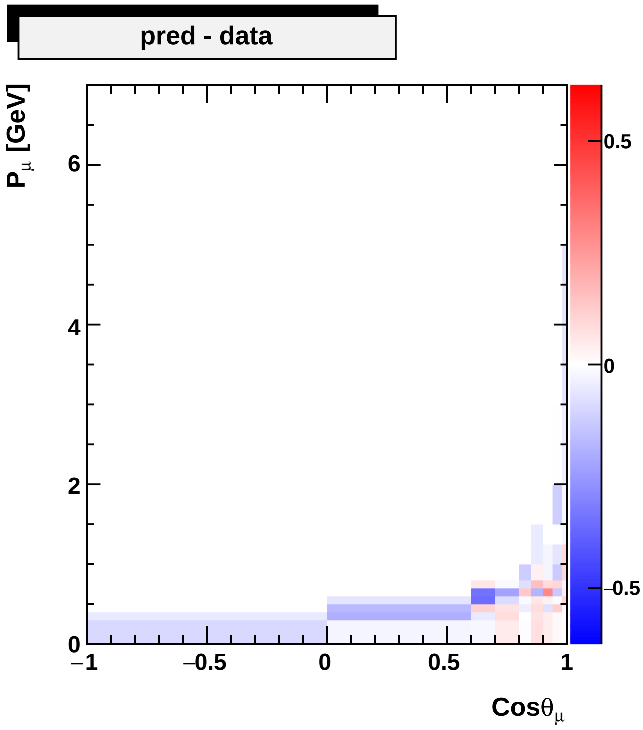
VS

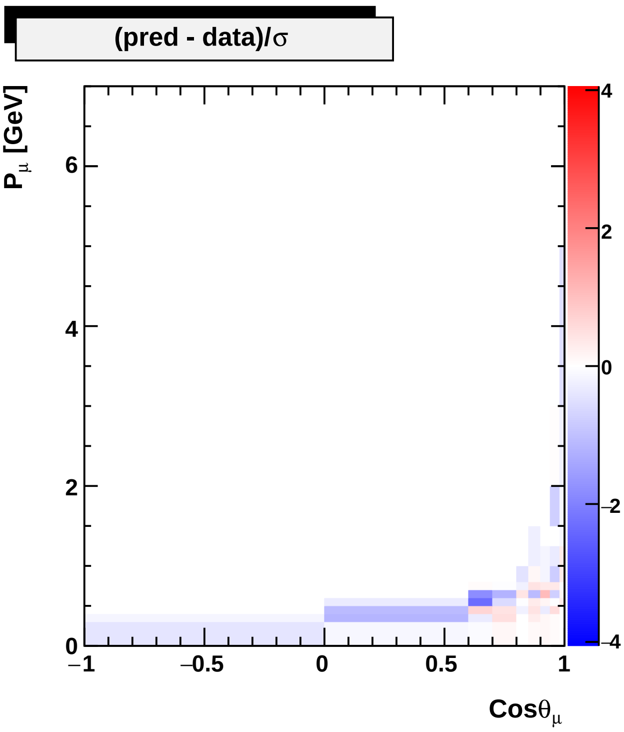
trunk:G00_00b:t2k_nd280_numu_fhc

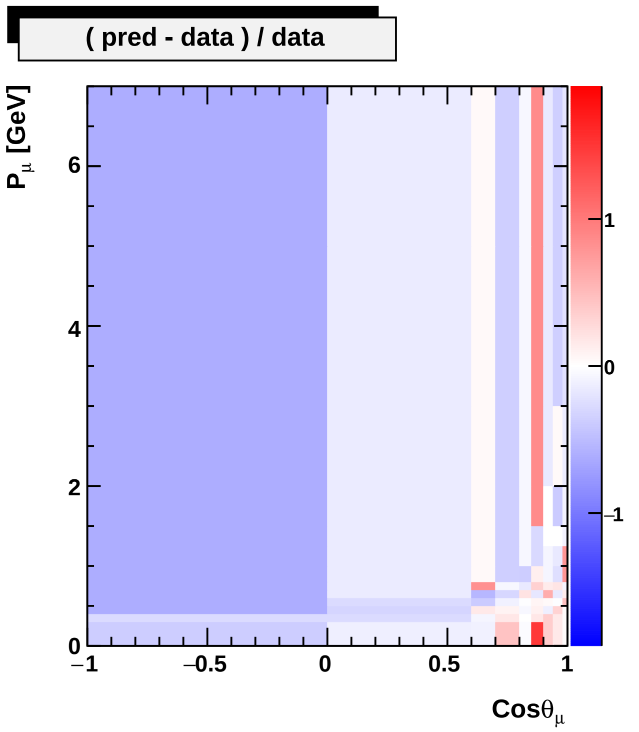
$\partial^2\sigma/\partial\text{Cos}\theta_\mu/\partial P_\mu$

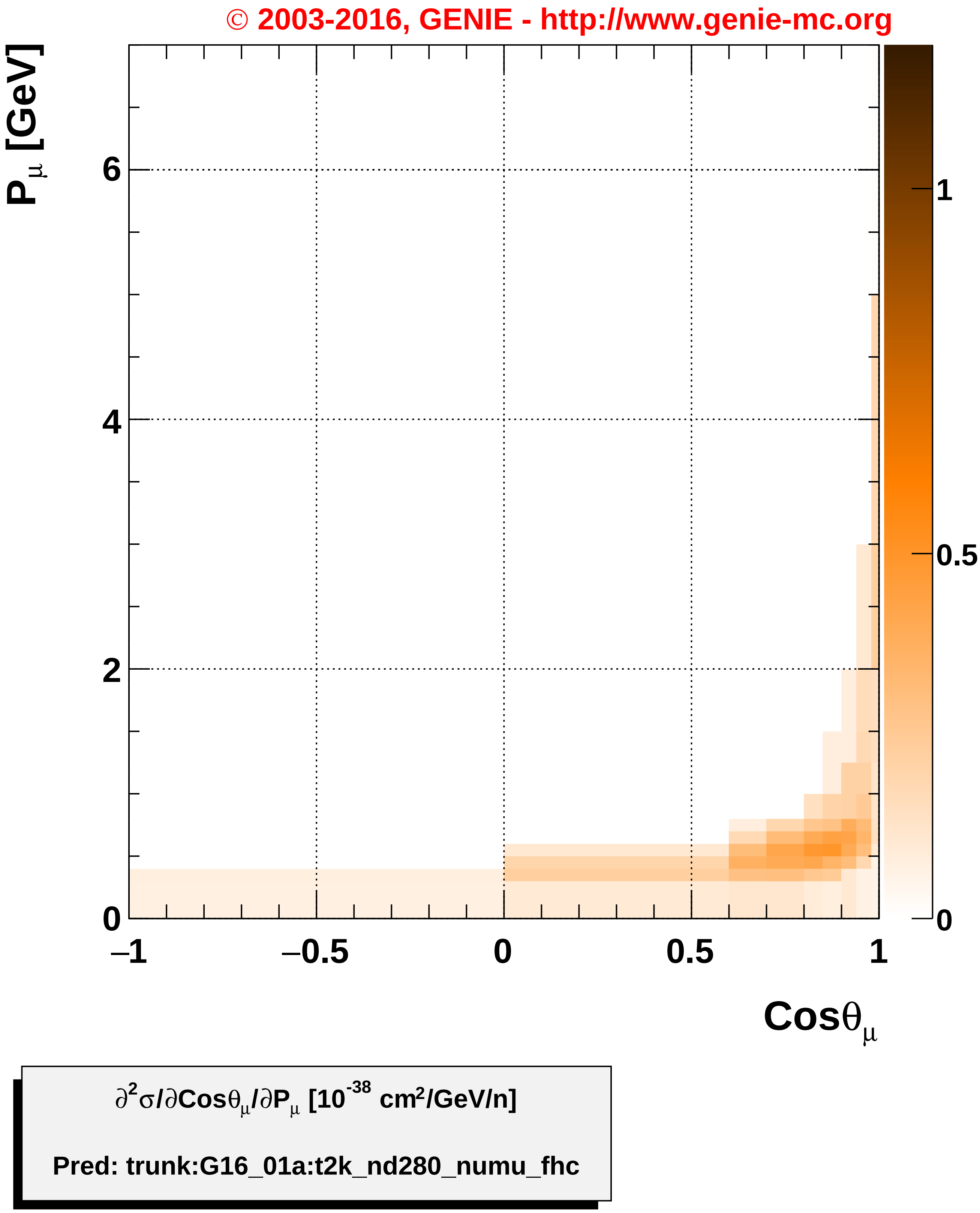
$[10^{-38}\ \text{cm}^2/\text{GeV/n}]$

χ^2 = 49.5983/67 DoF





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P_{μ} [GeV]
0
2
4
6
–1
–0.5
0
0.5
1
$Cos\theta_{\mu}$
0
0.5
1
$\partial^2\sigma/\partial Cos\theta_{\mu}/\partial P_{\mu}$ [10^{-38} cm^2/GeV/n]
Pred: trunk:G16_01a:t2k_nd280_numu_fhc

t2k_nd280_numucc0pi_2015

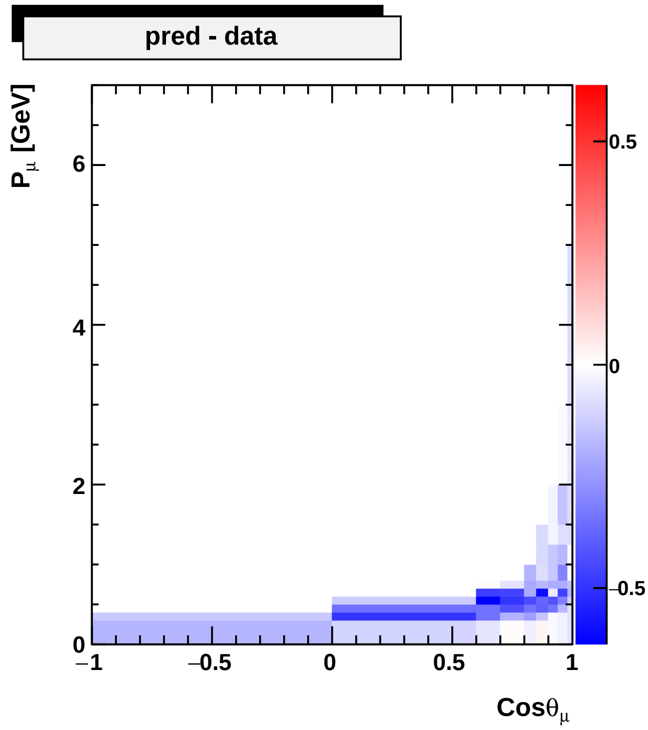
VS

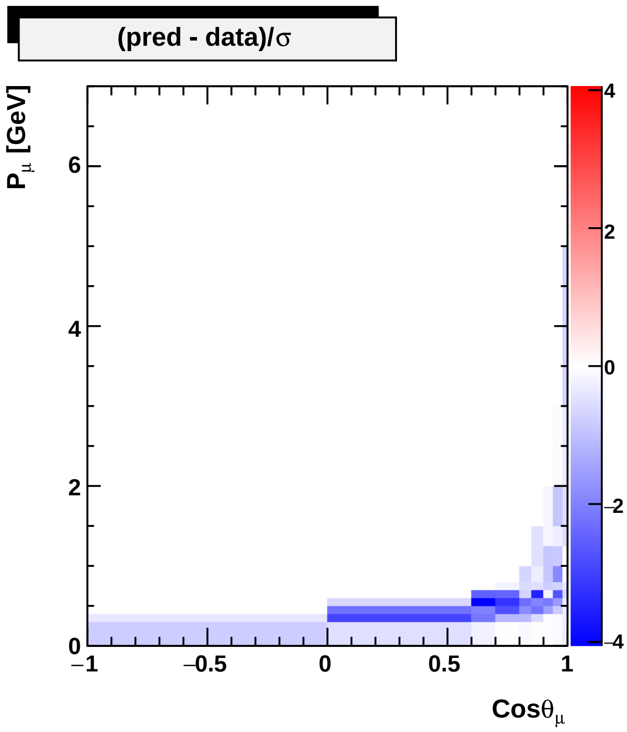
trunk:G16_01a:t2k_nd280_numu_fhc

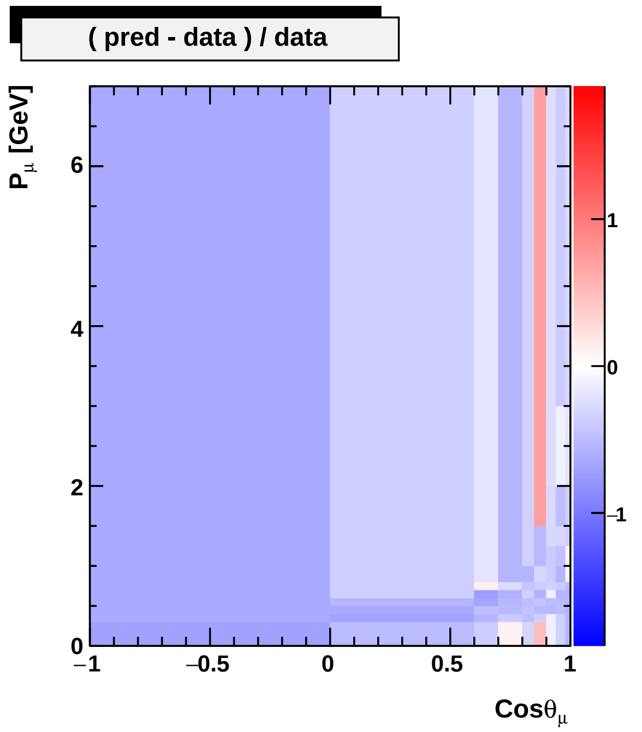
$\partial^2\sigma/\partial \mathrm{Cos}\theta_\mu/\partial P_\mu$

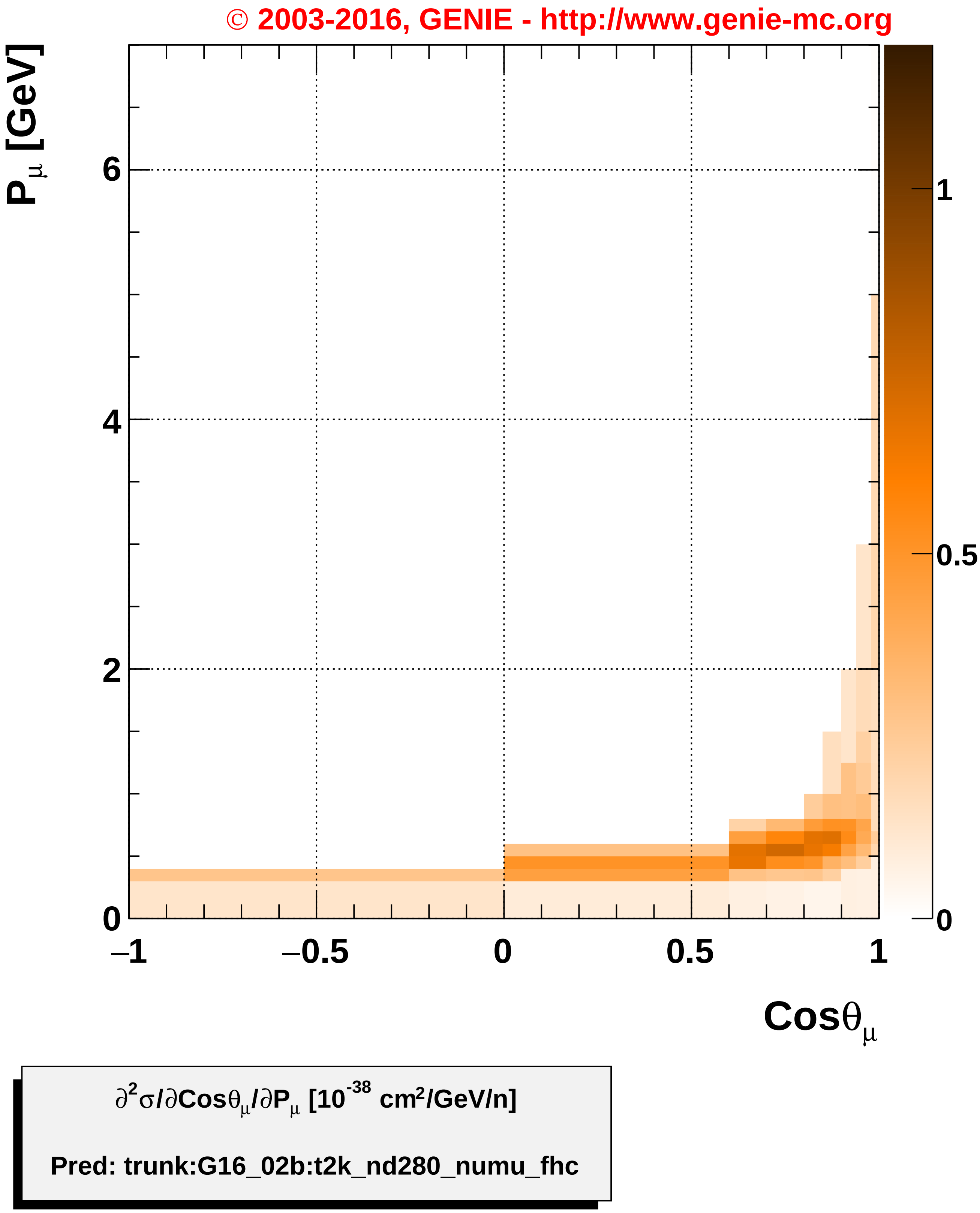
$[10^{-38}\ \mathrm{cm}^2/\mathrm{GeV/n}]$

χ^2 = 176.854/67 DoF








© 2003-2016, GENIE - http://www.genie-mc.org
P_μ [GeV]
6
4
2
0
–1
–0.5
0
0.5
1
$Cos\theta_\mu$
1
0.5
0
$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$ [10^{-38} cm^2/GeV/n]
Pred: trunk:G16_02b:t2k_nd280_numu_fhc

t2k_nd280_numucc0pi_2015

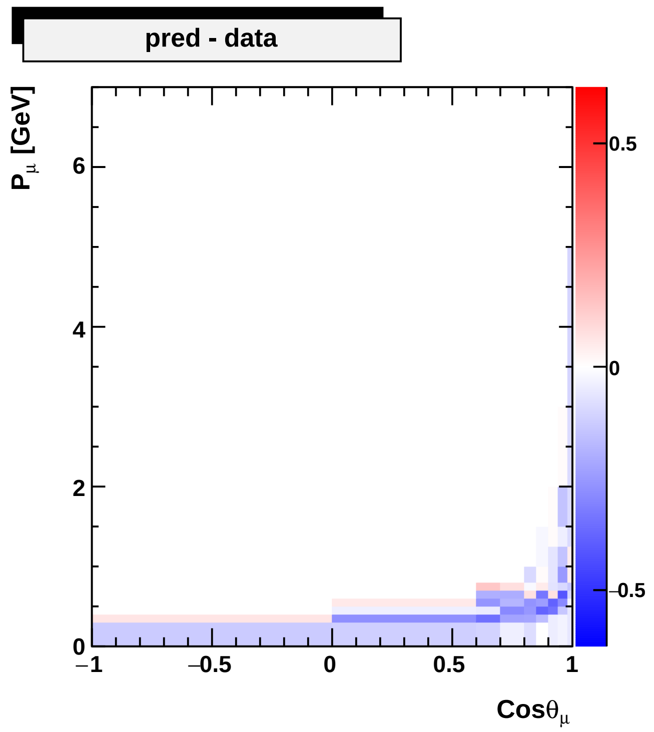
VS

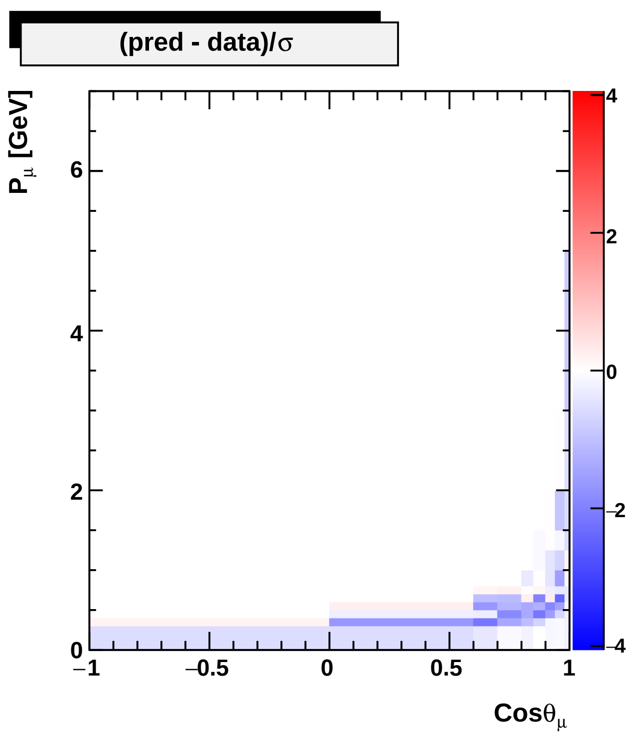
trunk:G16_02b:t2k_nd280_numu_fhc

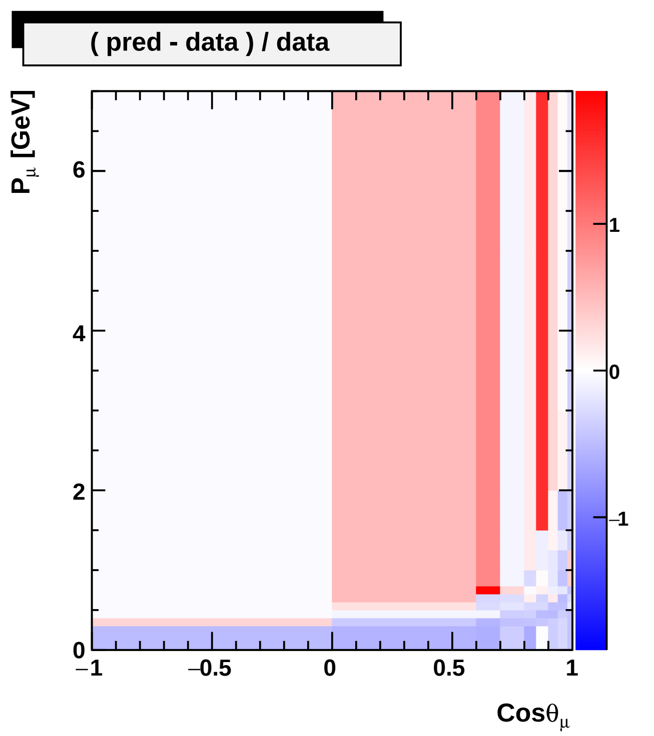
$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$

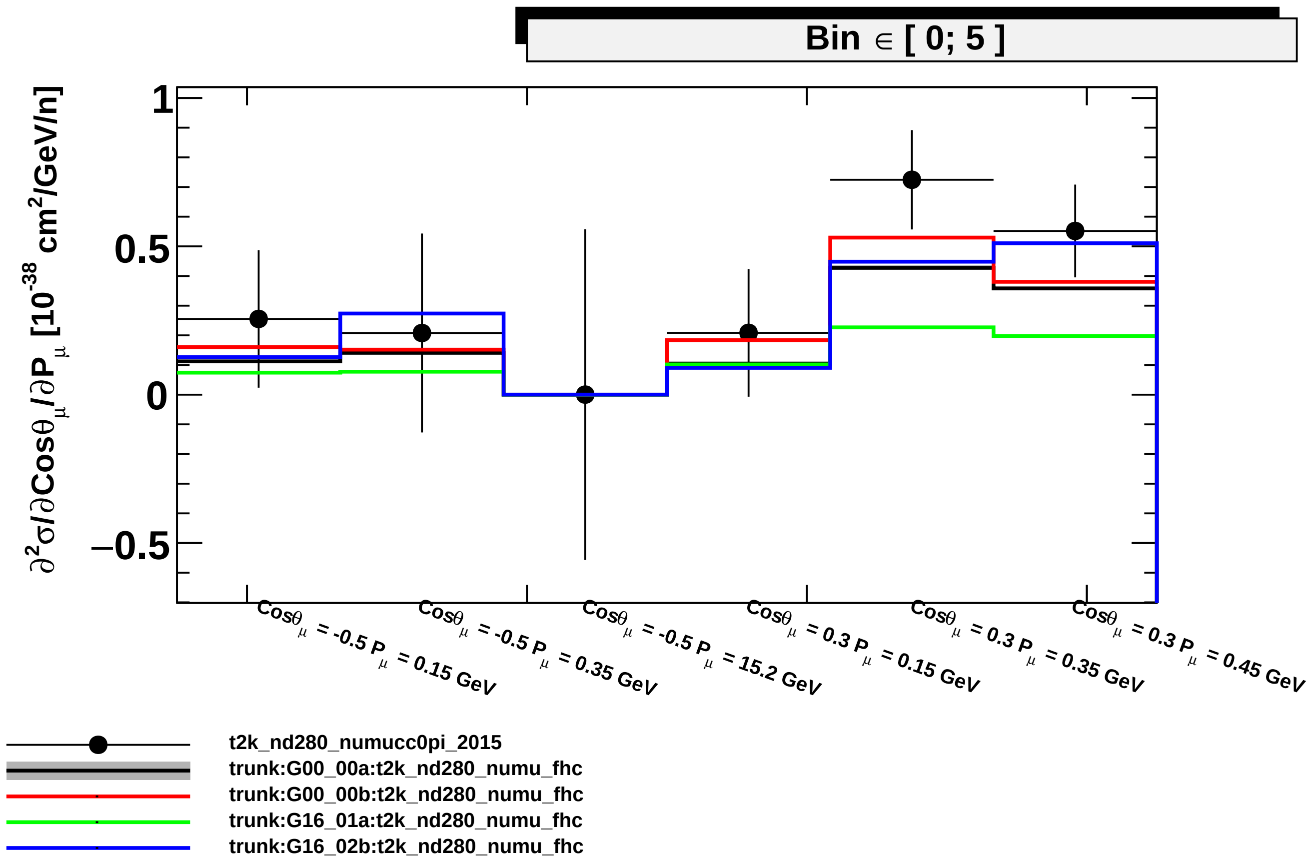
$[10^{-38}\ cm^2/GeV/n]$

χ^2 = 87.0812/67 DoF

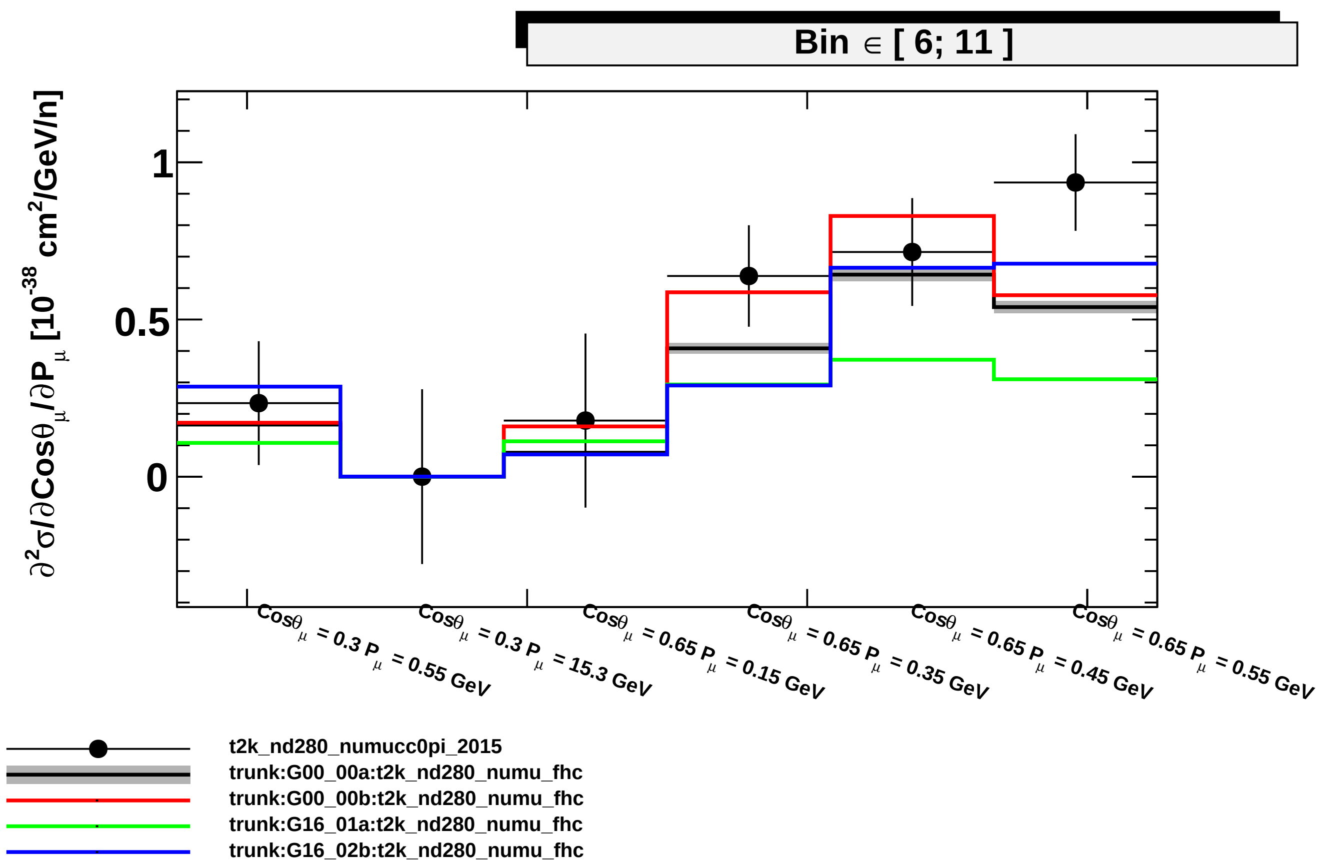




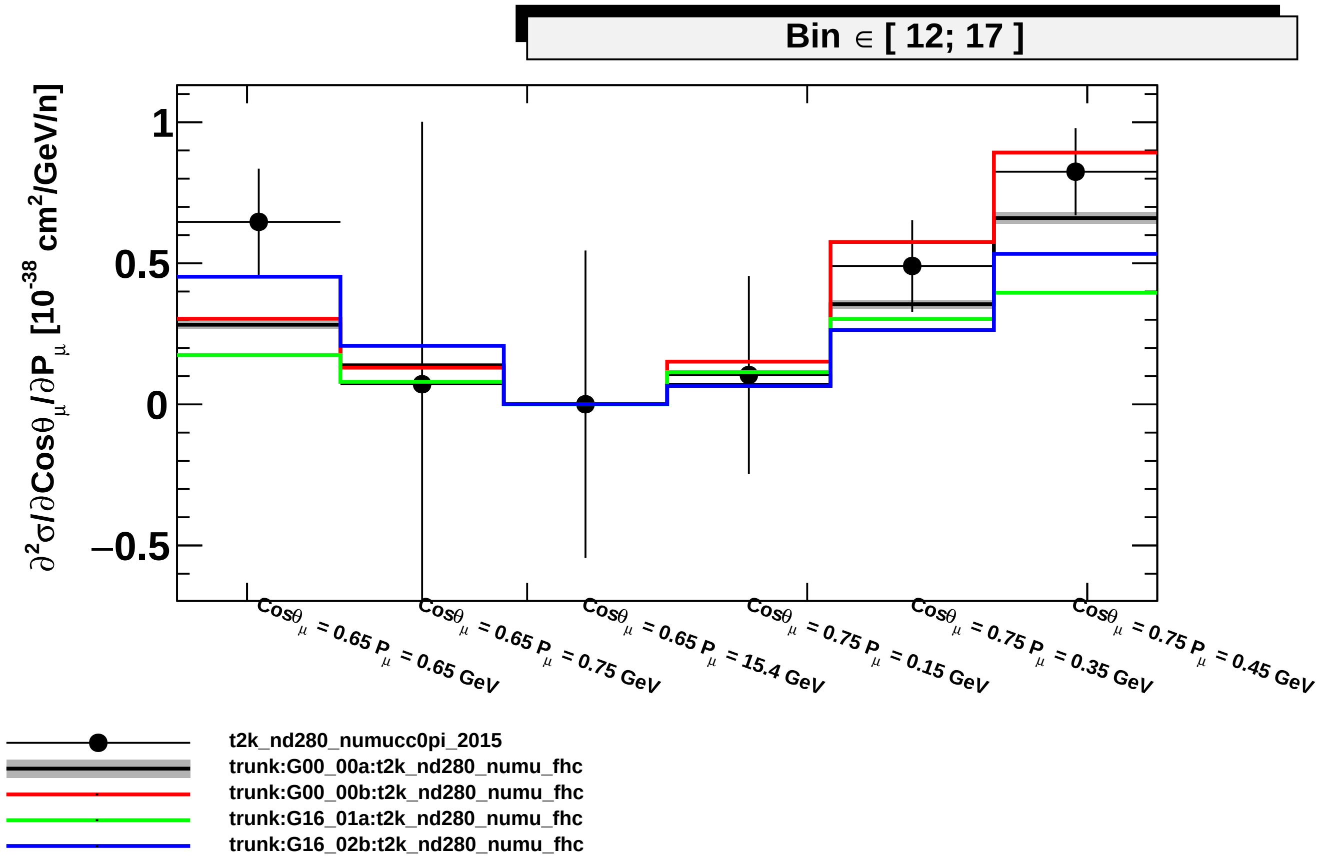


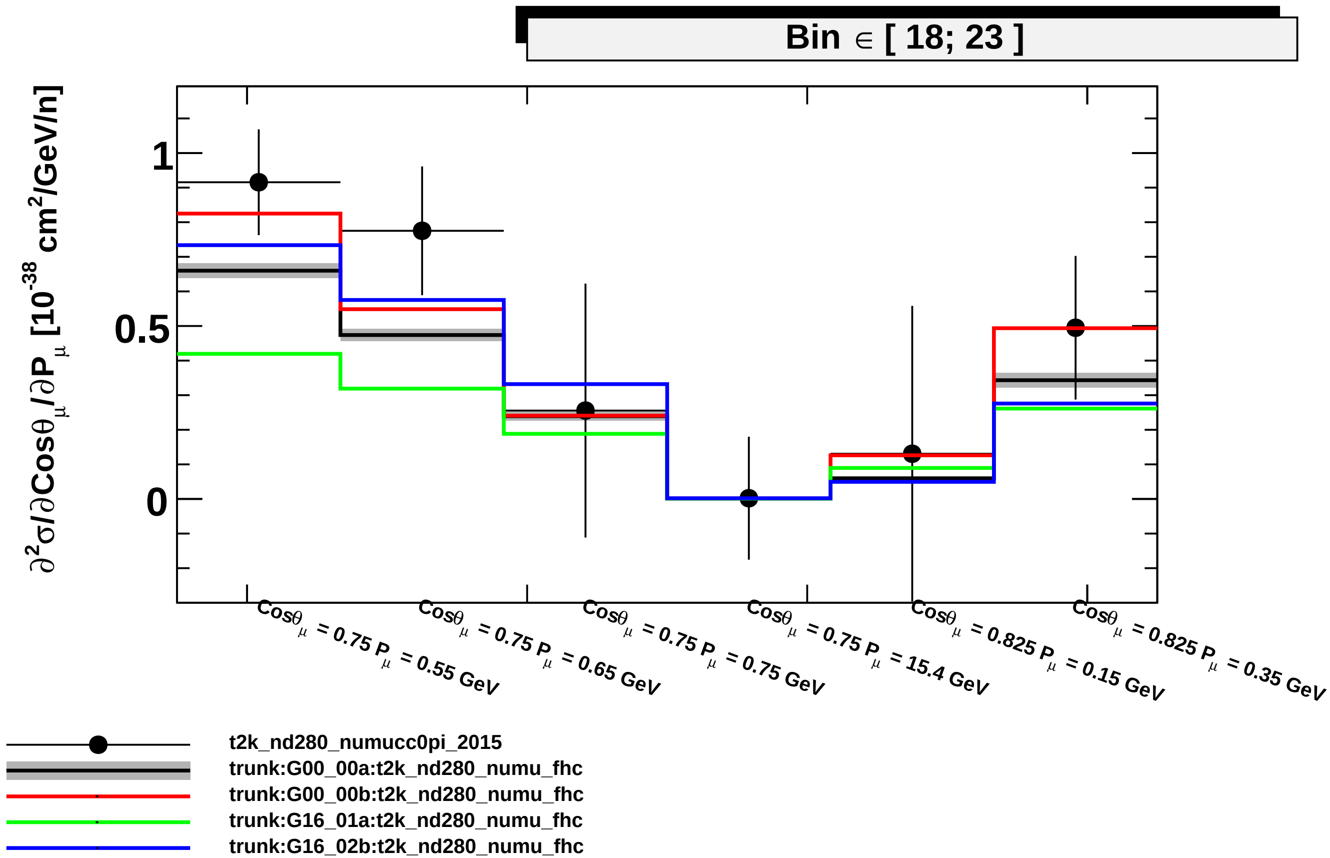


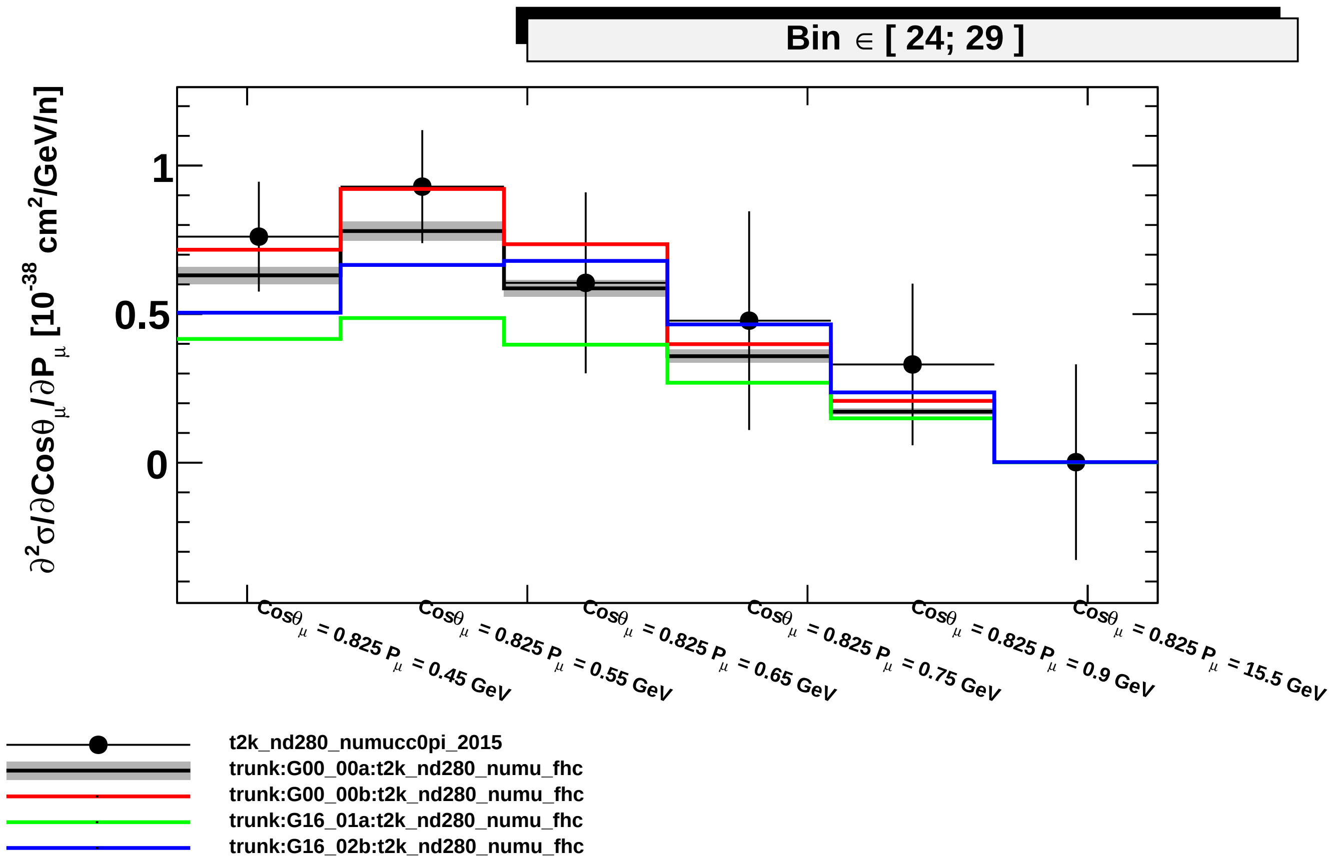
Bin ∈ [0; 5]
∂²σ/∂Cosθ_μ/∂P_μ [10⁻³⁸ cm²/GeV/n]
1
0.5
0
−0.5
Cosθ_μ = -0.5 P_μ = 0.15 GeV
Cosθ_μ = -0.5 P_μ = 0.35 GeV
Cosθ_μ = -0.5 P_μ = 15.2 GeV
Cosθ_μ = 0.3 P_μ = 0.15 GeV
Cosθ_μ = 0.3 P_μ = 0.35 GeV
Cosθ_μ = 0.3 P_μ = 0.45 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc



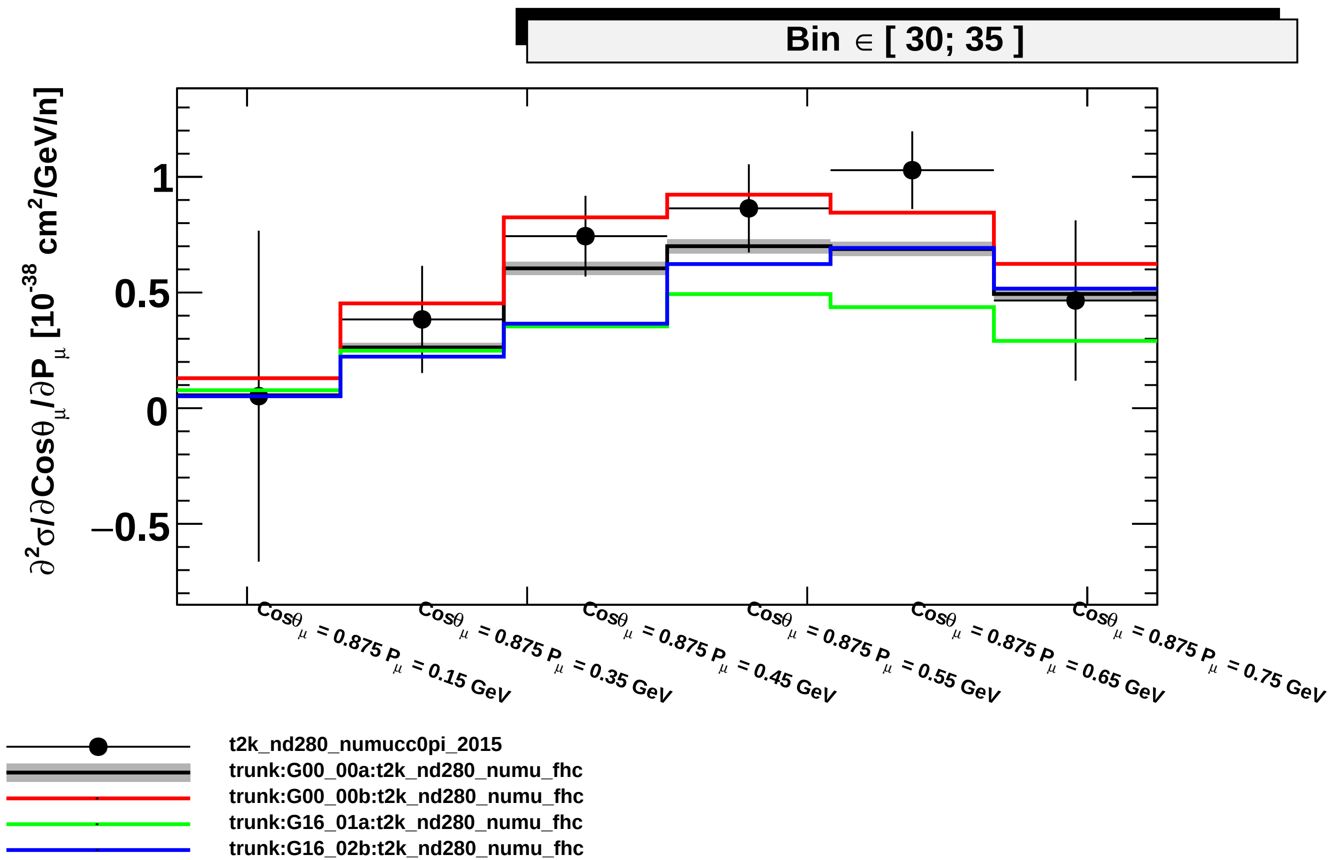
Bin ∈ [6; 11]
∂²σ/∂Cosθ_μ/∂P_μ [10⁻³⁸ cm²/GeV/n]
1
0.5
0
Cosθ_μ = 0.3 P_μ = 0.55 GeV
Cosθ_μ = 0.3 P_μ = 15.3 GeV
Cosθ_μ = 0.65 P_μ = 0.15 GeV
Cosθ_μ = 0.65 P_μ = 0.35 GeV
Cosθ_μ = 0.65 P_μ = 0.45 GeV
Cosθ_μ = 0.65 P_μ = 0.55 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc


Bin ∈ [12; 17]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$ [10^{-38} cm^2/GeV/n]
1
0.5
0
−0.5
$Cos\theta_\mu$ = 0.65 P_μ = 0.65 GeV
$Cos\theta_\mu$ = 0.65 P_μ = 0.75 GeV
$Cos\theta_\mu$ = 0.65 P_μ = 15.4 GeV
$Cos\theta_\mu$ = 0.75 P_μ = 0.15 GeV
$Cos\theta_\mu$ = 0.75 P_μ = 0.35 GeV
$Cos\theta_\mu$ = 0.75 P_μ = 0.45 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc

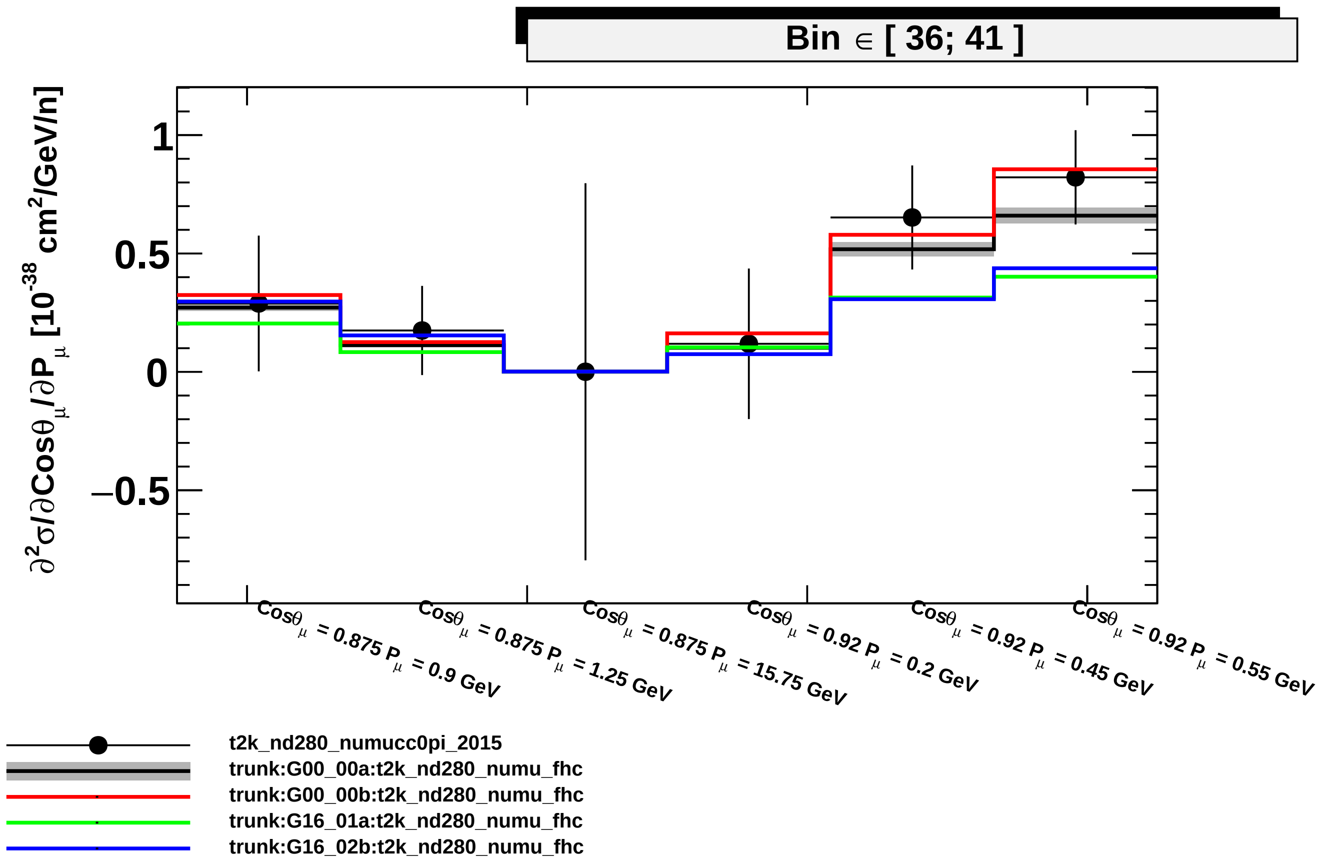

Bin ∈ [18; 23]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$ [10^{-38} cm^2/GeV/n]
1
0.5
0
$Cos\theta_\mu$ = 0.75 P_μ = 0.55 GeV
$Cos\theta_\mu$ = 0.75 P_μ = 0.65 GeV
$Cos\theta_\mu$ = 0.75 P_μ = 0.75 GeV
$Cos\theta_\mu$ = 0.75 P_μ = 15.4 GeV
$Cos\theta_\mu$ = 0.825 P_μ = 0.15 GeV
$Cos\theta_\mu$ = 0.825 P_μ = 0.35 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc



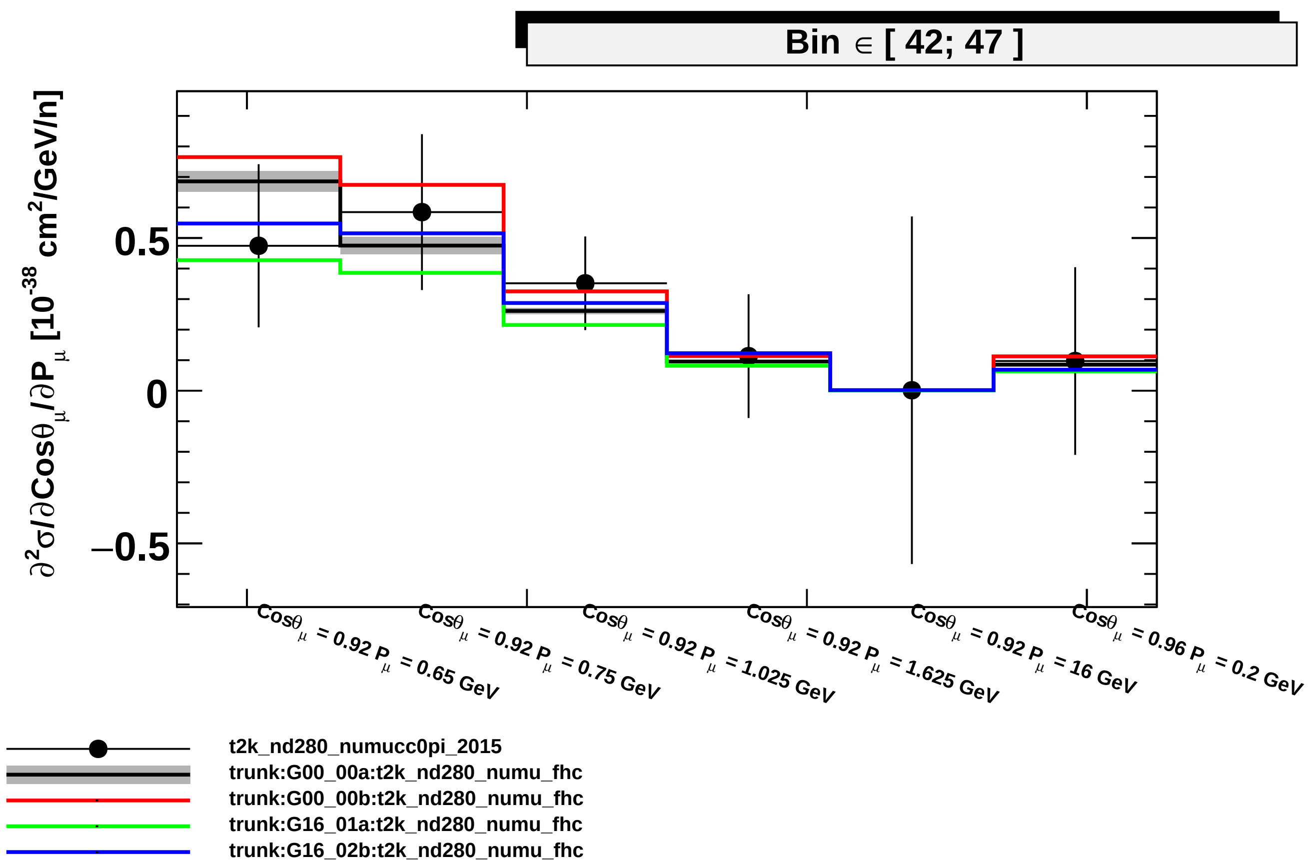
Bin ∈ [24; 29]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$ [10^{-38} cm^2/GeV/n]
1
0.5
0
$Cos\theta_\mu$ = 0.825 P_μ = 0.45 GeV
$Cos\theta_\mu$ = 0.825 P_μ = 0.55 GeV
$Cos\theta_\mu$ = 0.825 P_μ = 0.65 GeV
$Cos\theta_\mu$ = 0.825 P_μ = 0.75 GeV
$Cos\theta_\mu$ = 0.825 P_μ = 0.9 GeV
$Cos\theta_\mu$ = 0.825 P_μ = 15.5 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc



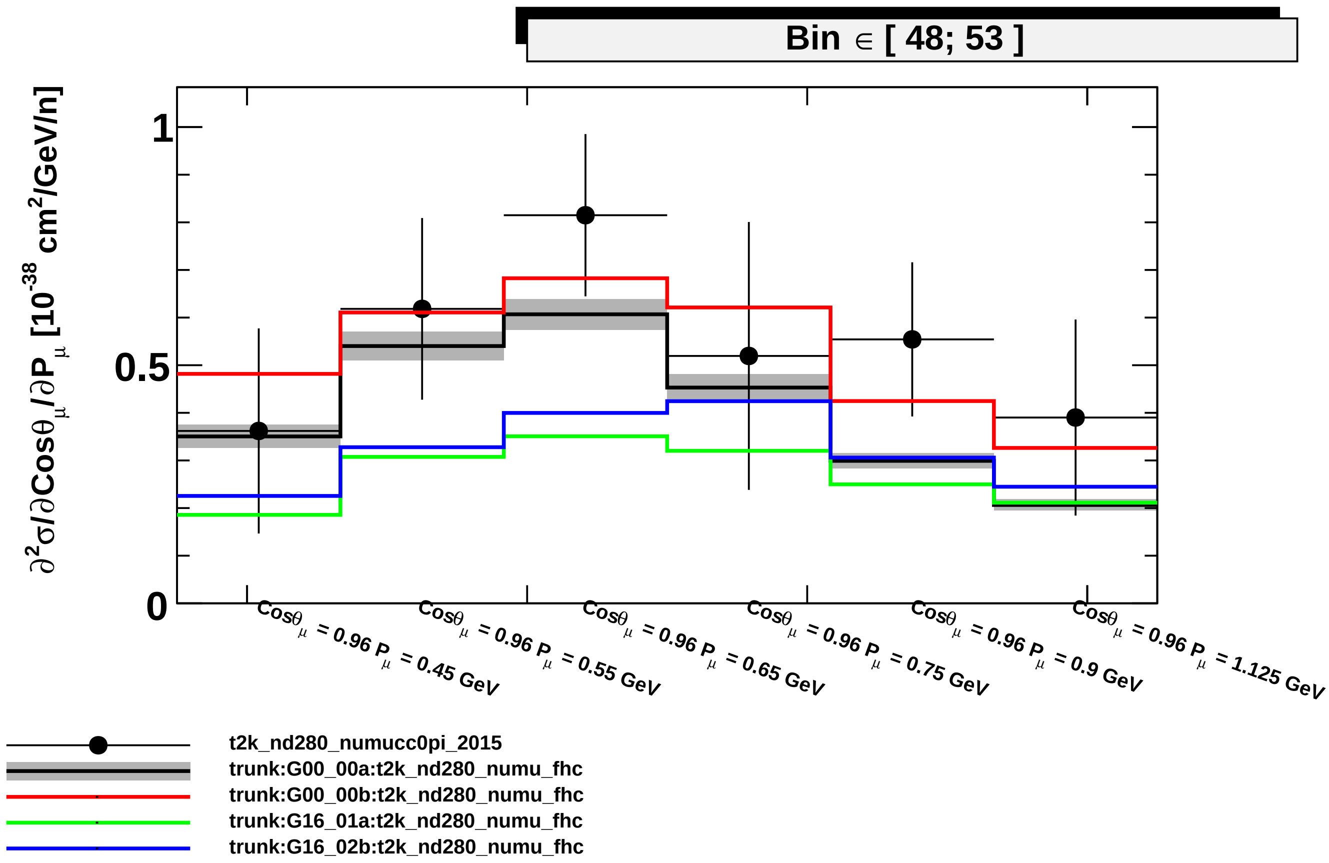
Bin ∈ [30; 35]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$ [10^{-38} cm^2/GeV/n]
1
0.5
0
−0.5
$Cos\theta_\mu$ = 0.875 P_μ = 0.15 GeV
$Cos\theta_\mu$ = 0.875 P_μ = 0.35 GeV
$Cos\theta_\mu$ = 0.875 P_μ = 0.45 GeV
$Cos\theta_\mu$ = 0.875 P_μ = 0.55 GeV
$Cos\theta_\mu$ = 0.875 P_μ = 0.65 GeV
$Cos\theta_\mu$ = 0.875 P_μ = 0.75 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc

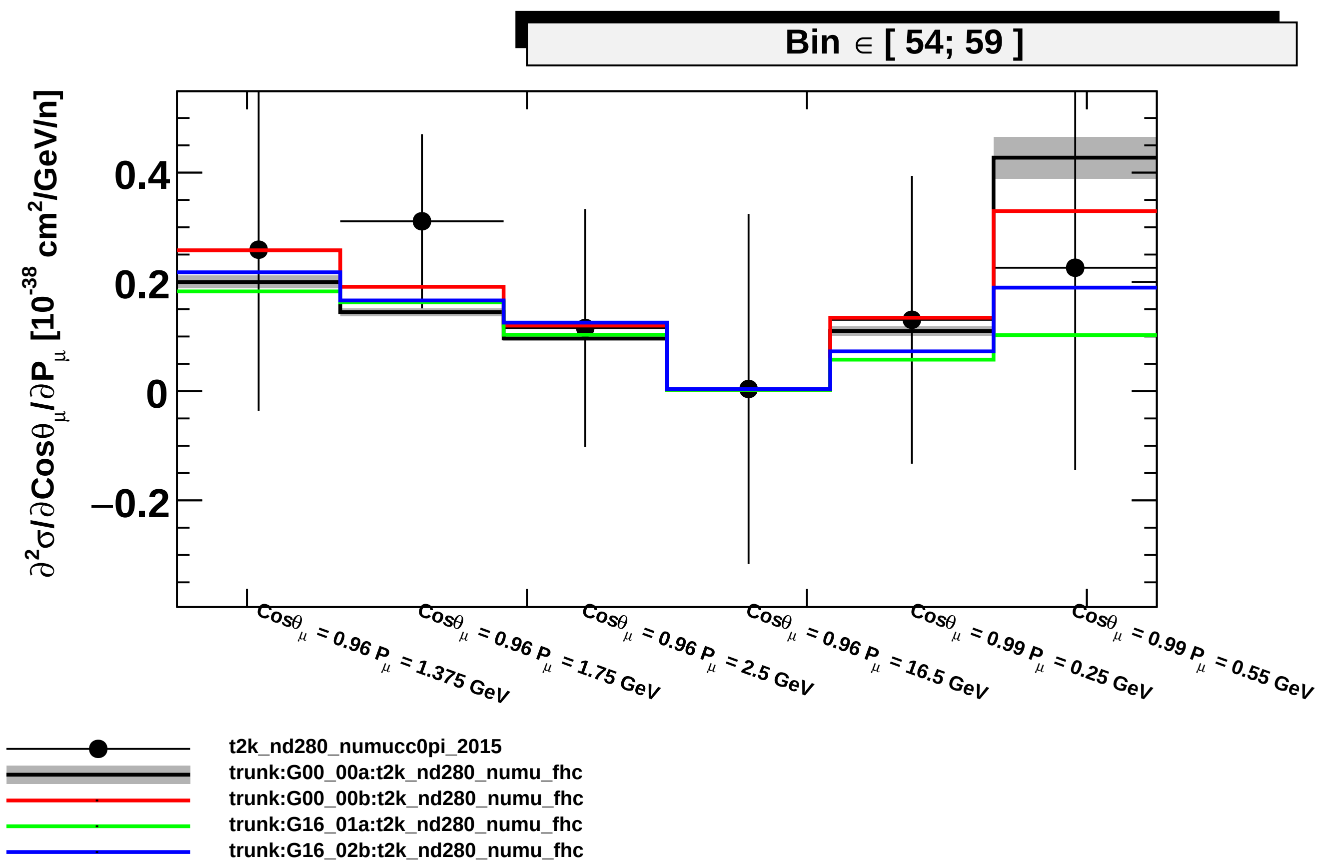


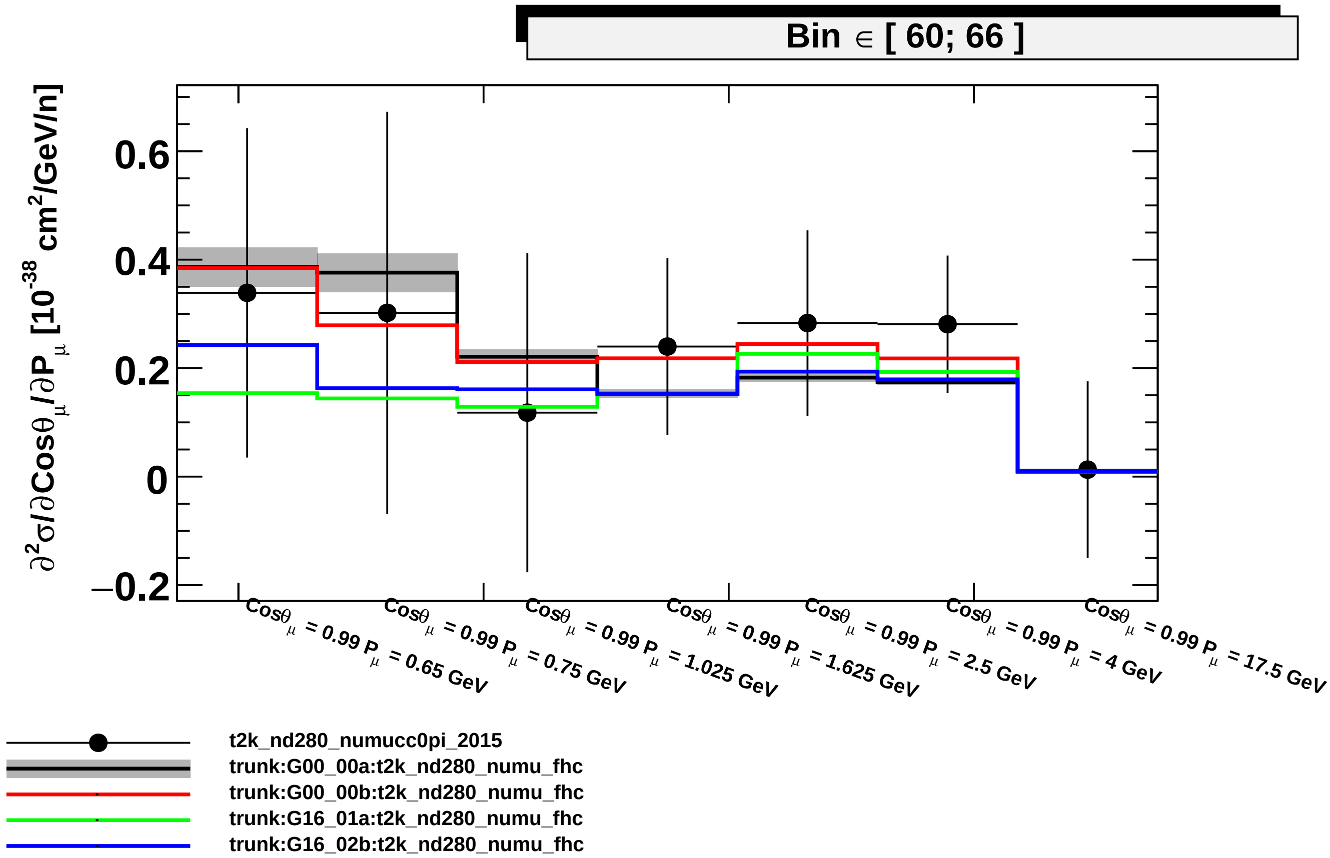
Bin ∈ [36; 41]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$ [10^{-38} cm^2/GeV/n]
1
0.5
0
−0.5
$Cos\theta_\mu$ = 0.875 P_μ = 0.9 GeV
$Cos\theta_\mu$ = 0.875 P_μ = 1.25 GeV
$Cos\theta_\mu$ = 0.875 P_μ = 15.75 GeV
$Cos\theta_\mu$ = 0.92 P_μ = 0.2 GeV
$Cos\theta_\mu$ = 0.92 P_μ = 0.45 GeV
$Cos\theta_\mu$ = 0.92 P_μ = 0.55 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc



Bin ∈ [42; 47]
$\partial^2\sigma/\partial Cos\theta_\mu/\partial P_\mu$ [10^{-38} cm^2/GeV/n]
0.5
0
−0.5
$Cos\theta_\mu$ = 0.92 P_μ = 0.65 GeV
$Cos\theta_\mu$ = 0.92 P_μ = 0.75 GeV
$Cos\theta_\mu$ = 0.92 P_μ = 1.025 GeV
$Cos\theta_\mu$ = 0.92 P_μ = 1.625 GeV
$Cos\theta_\mu$ = 0.92 P_μ = 16 GeV
$Cos\theta_\mu$ = 0.96 P_μ = 0.2 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc

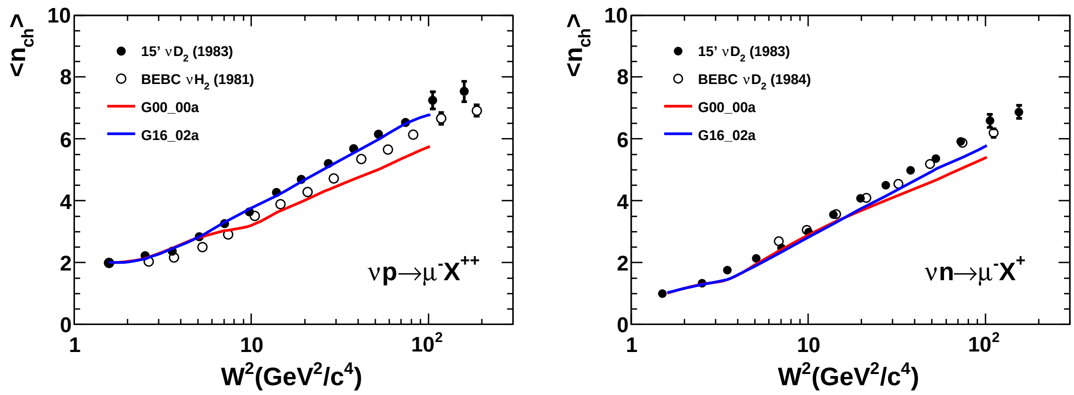

Bin ∈ [48; 53]
∂²σ/∂Cosθ_μ/∂P_μ [10^-38 cm²/GeV/n]
1
0.5
0
Cosθ_μ = 0.96 P_μ = 0.45 GeV
Cosθ_μ = 0.96 P_μ = 0.55 GeV
Cosθ_μ = 0.96 P_μ = 0.65 GeV
Cosθ_μ = 0.96 P_μ = 0.75 GeV
Cosθ_μ = 0.96 P_μ = 0.9 GeV
Cosθ_μ = 0.96 P_μ = 1.125 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc


Bin ∈ [54; 59]
∂²σ/∂Cosθ_μ/∂P_μ [10^-38 cm²/GeV/n]
0.4
0.2
0
−0.2
Cosθ_μ = 0.96 P_μ = 1.375 GeV
Cosθ_μ = 0.96 P_μ = 1.75 GeV
Cosθ_μ = 0.96 P_μ = 2.5 GeV
Cosθ_μ = 0.96 P_μ = 16.5 GeV
Cosθ_μ = 0.99 P_μ = 0.25 GeV
Cosθ_μ = 0.99 P_μ = 0.55 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc

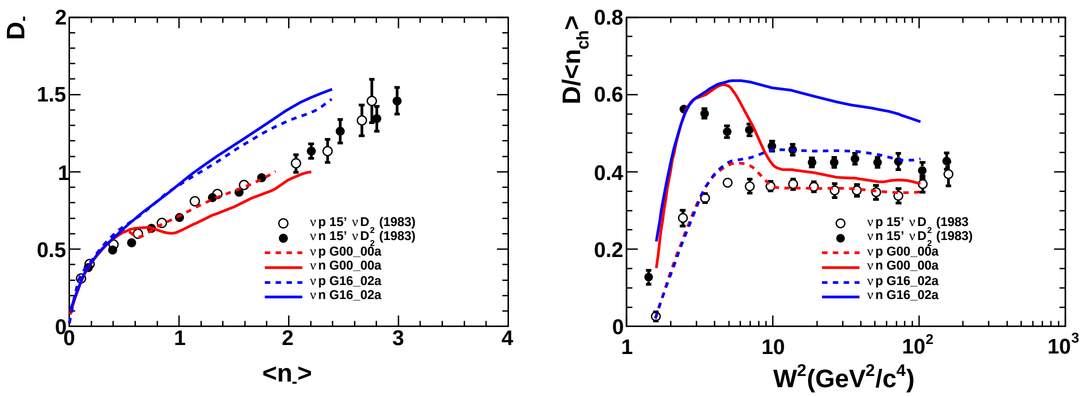

Bin ∈ [60; 66]
∂²σ/∂Cosθ_μ/∂P_μ [10^-38 cm²/GeV/n]
0.6
0.4
0.2
0
−0.2
Cosθ_μ = 0.99 P_μ = 0.65 GeV
Cosθ_μ = 0.99 P_μ = 0.75 GeV
Cosθ_μ = 0.99 P_μ = 1.025 GeV
Cosθ_μ = 0.99 P_μ = 1.625 GeV
Cosθ_μ = 0.99 P_μ = 2.5 GeV
Cosθ_μ = 0.99 P_μ = 4 GeV
Cosθ_μ = 0.99 P_μ = 17.5 GeV
t2k_nd280_numucc0pi_2015
trunk:G00_00a:t2k_nd280_numu_fhc
trunk:G00_00b:t2k_nd280_numu_fhc
trunk:G16_01a:t2k_nd280_numu_fhc
trunk:G16_02b:t2k_nd280_numu_fhc

GENIE comparison with data on neutrino-induced hadronization

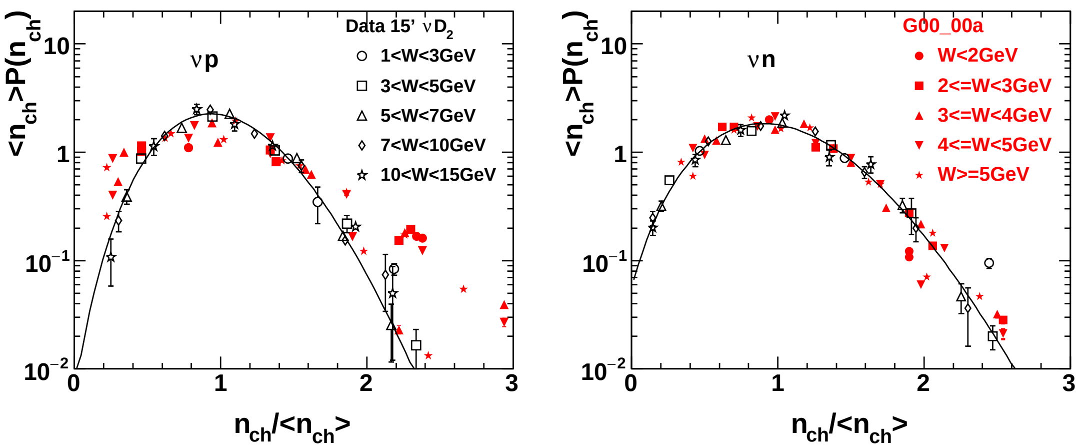
2016/11/21 16:16:54



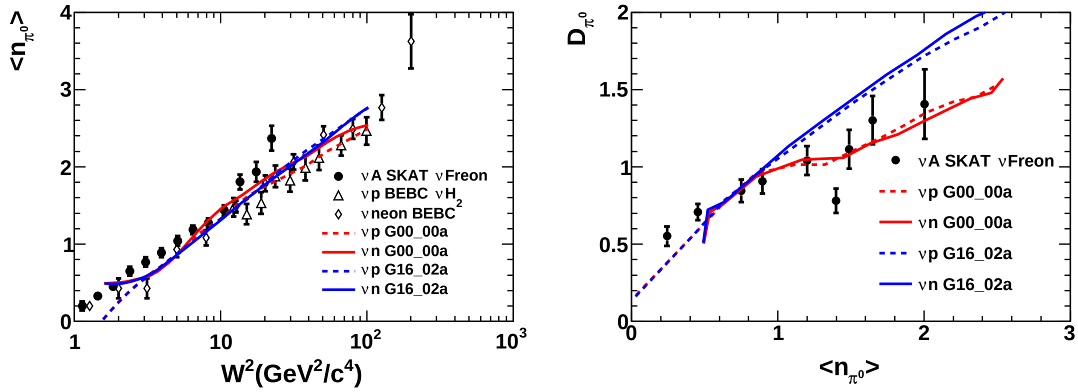
<n_ch>
15' νD2 (1983)
BEBC νH2 (1981)
G00_00a
G16_02a
νp→μ-X++
W2(GeV2/c4)
<n_ch>
15' νD2 (1983)
BEBC νD2 (1984)
G00_00a
G16_02a
νn→μ-X+
W2(GeV2/c4)



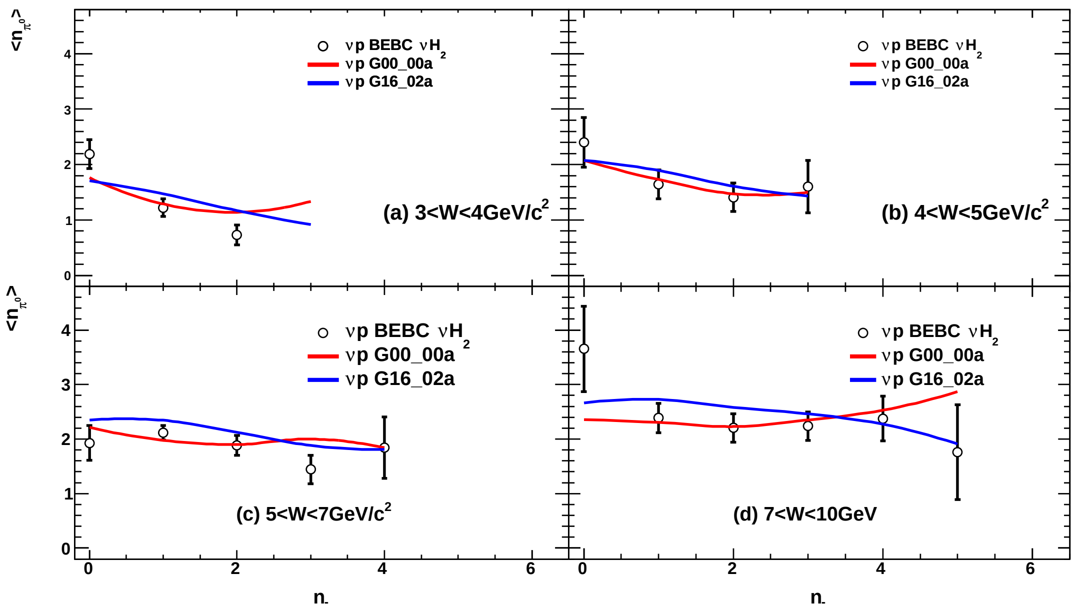
D-
<n->
νp 15' νD2 (1983)
νn 15' νD2 (1983)
νp G00_00a
νn G00_00a
νp G16_02a
νn G16_02a
D/<nch>
W2(GeV2/c4)



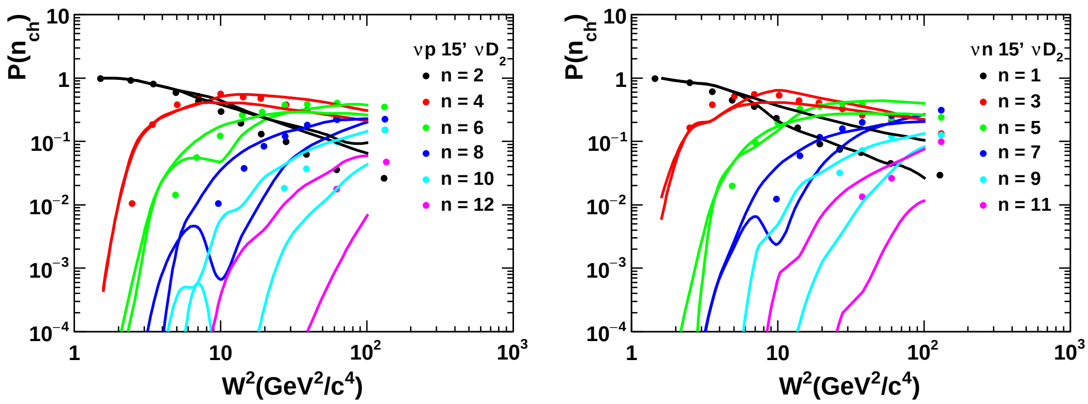
νp
νn
Data 15' νD2
1<W<3GeV
3<W<5GeV
5<W<7GeV
7<W<10GeV
10<W<15GeV
G00_00a
W<2GeV
2<=W<3GeV
3<=W<4GeV
4<=W<5GeV
W>=5GeV
<nch>P(nch)
nch/<nch>



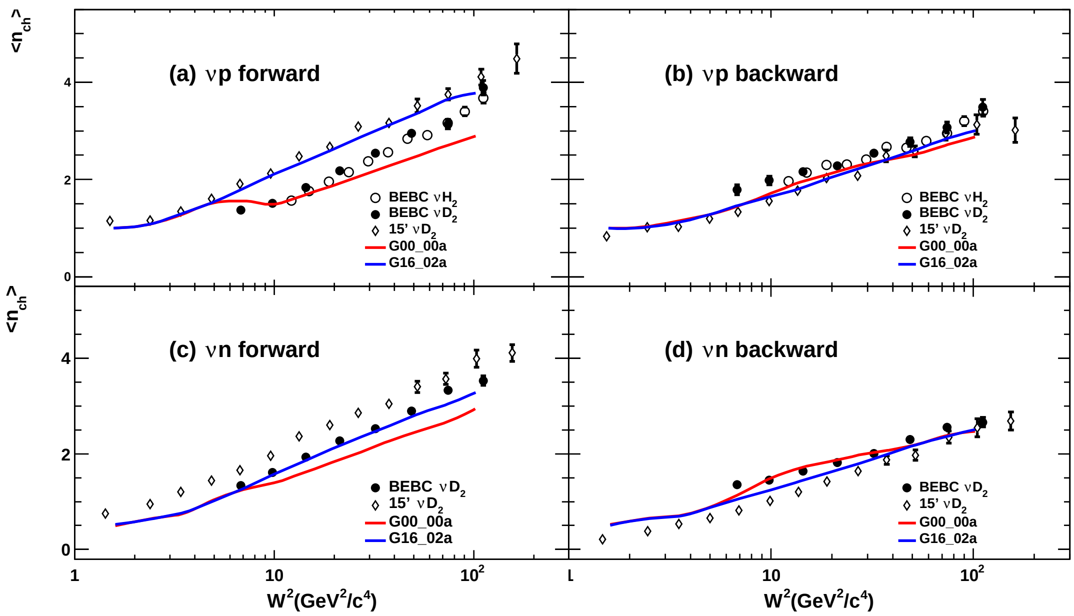
$<n_{\pi^0}>$
$W^2(GeV^2/c^4)$
νA SKAT νFreon
νp BEBC νH$_2$
νneon BEBC^2
νp G00_00a
νn G00_00a
νp G16_02a
νn G16_02a
D_{π^0}
$<n_{\pi^0}>$

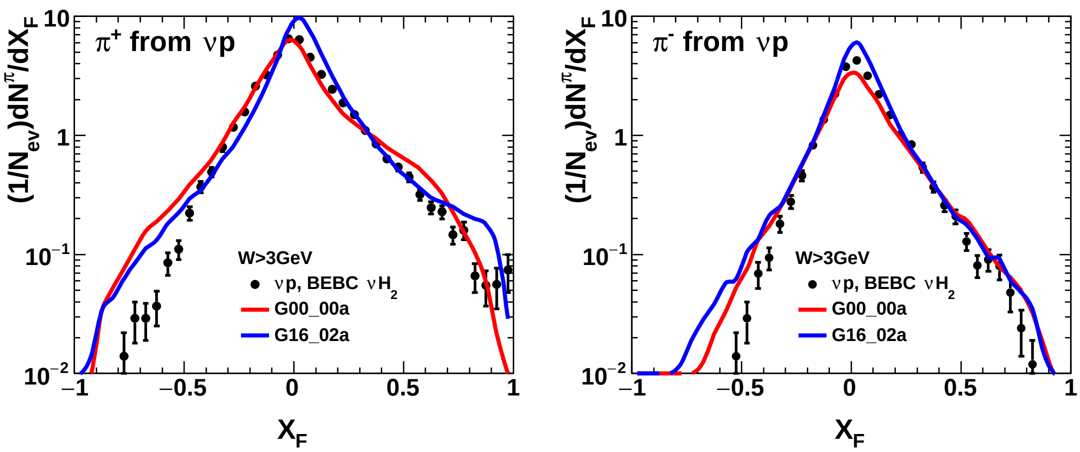


$\langle n_{\pi^0} \rangle$
νp BEBC νH_2
νp G00_00a
νp G16_02a
(a) 3<W<4GeV/c^2
(b) 4<W<5GeV/c^2
(c) 5<W<7GeV/c^2
(d) 7<W<10GeV
n_-

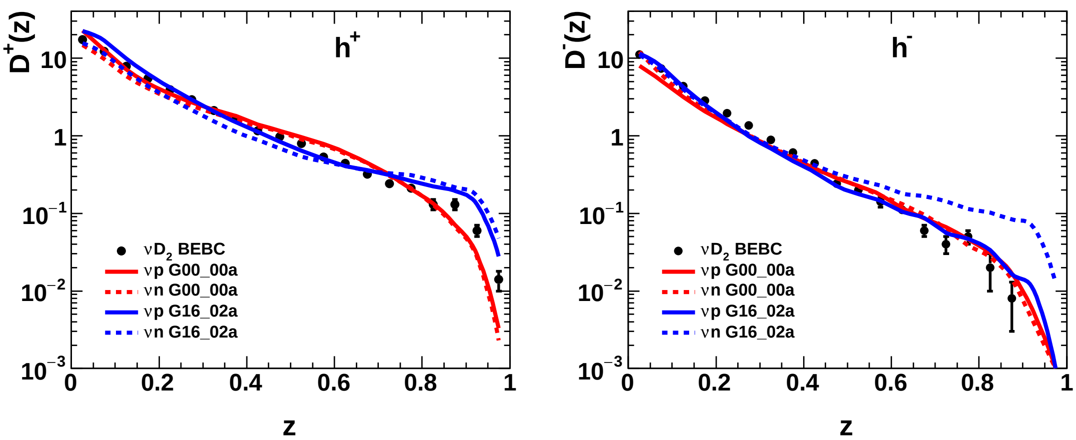


P(n_ch)
νp 15' νD2
n = 2
n = 4
n = 6
n = 8
n = 10
n = 12
W²(GeV²/c⁴)
νn 15' νD2
n = 1
n = 3
n = 5
n = 7
n = 9
n = 11

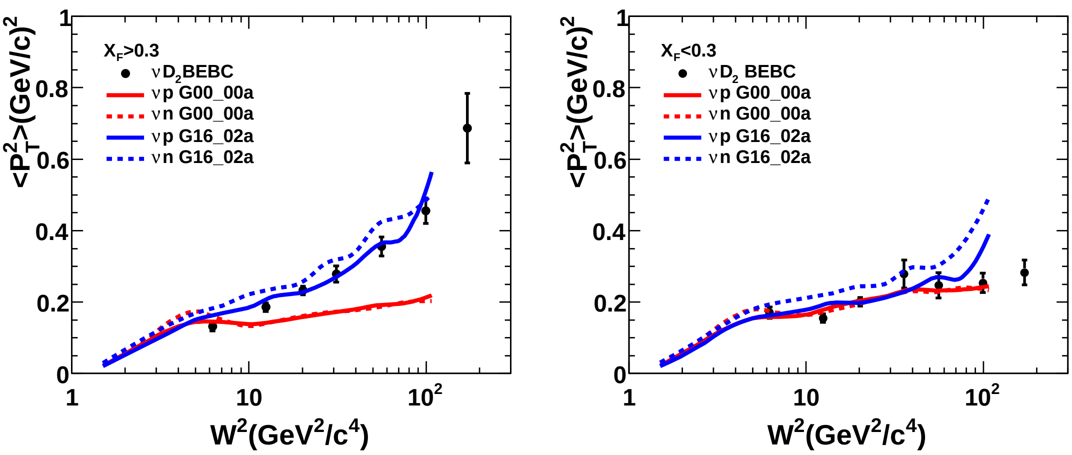

(a) νp forward
(b) νp backward
(c) νn forward
(d) νn backward
BEBC νH2
BEBC νD2
15' νD2
G00_00a
G16_02a
<n_ch>
W²(GeV²/c⁴)



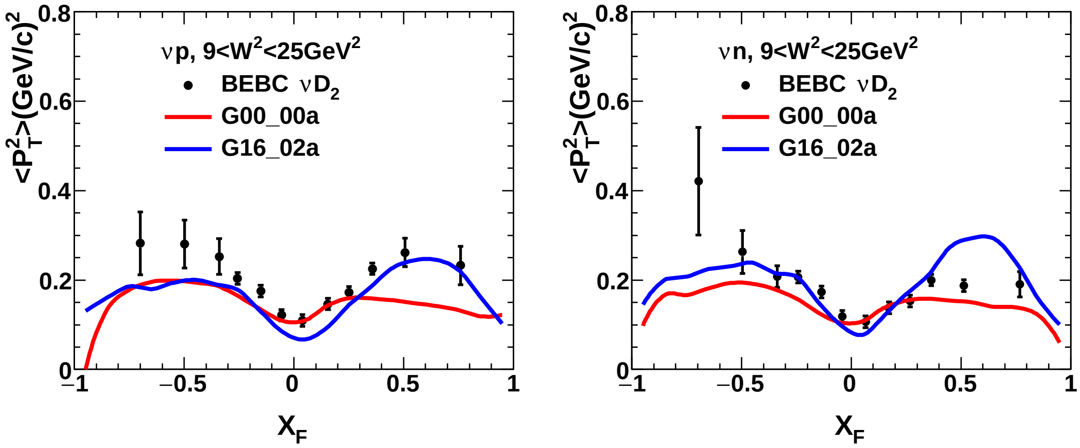
π^+ from νp
π^- from νp
$(1/N_{ev})dN^{\pi}/dX_F$
X_F
W>3GeV
νp, BEBC νH_2
G00_00a
G16_02a



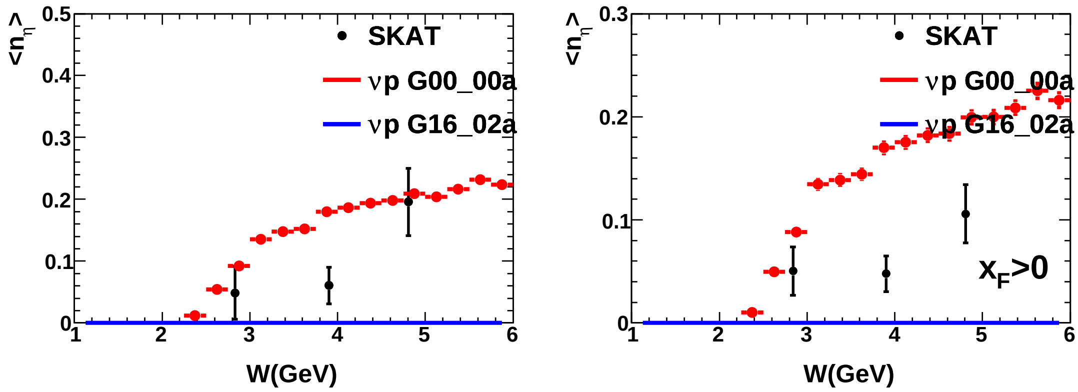
$D^+(z)$
h+
νD_2 BEBC
νp G00_00a
νn G00_00a
νp G16_02a
νn G16_02a
z
$D^-(z)$
h-
νD_2 BEBC
νp G00_00a
νn G00_00a
νp G16_02a
νn G16_02a
z



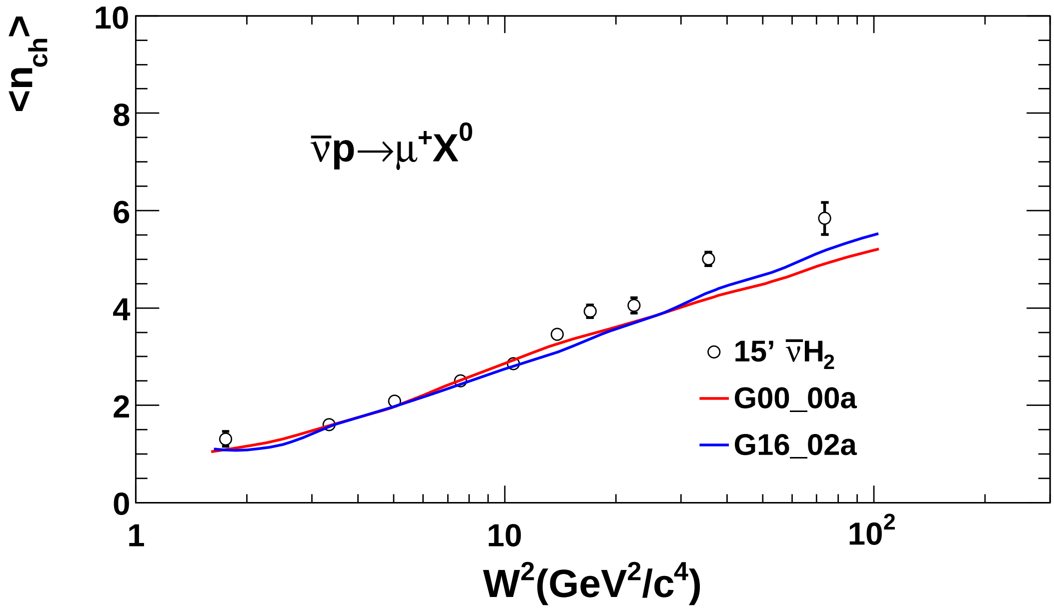
X_F>0.3
νD_2BEBC
νp G00_00a
νn G00_00a
νp G16_02a
νn G16_02a
$<P_T^2>(GeV/c)^2$
$W^2(GeV^2/c^4)$
X_F<0.3
νD_2 BEBC
νp G00_00a
νn G00_00a
νp G16_02a
νn G16_02a
$<P_T^2>(GeV/c)^2$
$W^2(GeV^2/c^4)$



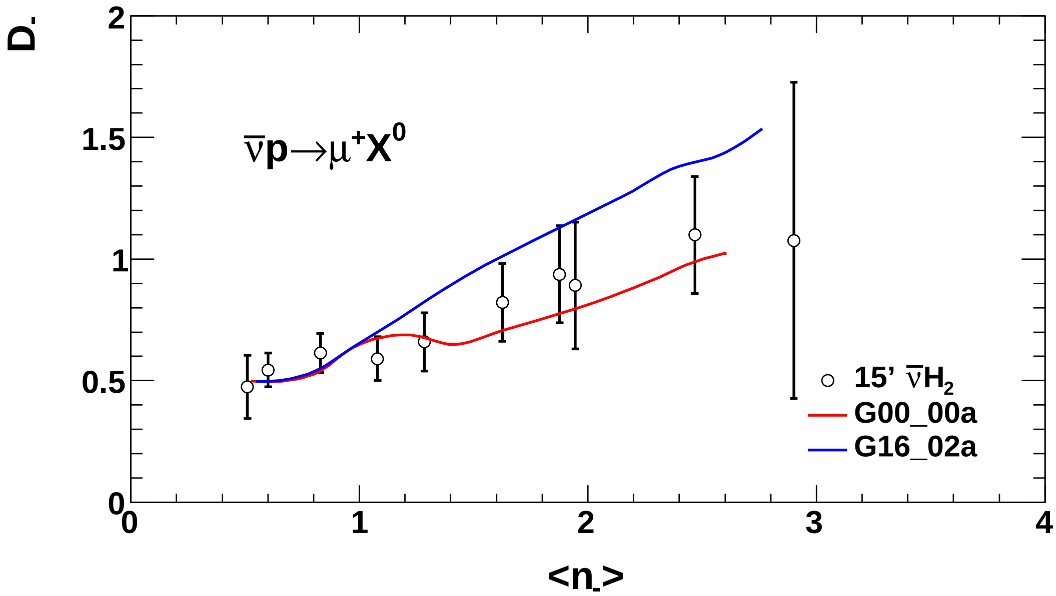
νp, 9<W²<25GeV²
BEBC νD₂
G00_00a
G16_02a
νn, 9<W²<25GeV²
BEBC νD₂
G00_00a
G16_02a
<P²_T>(GeV/c)²
X_F
0
0.2
0.4
0.6
0.8
−1
−0.5
0
0.5
1



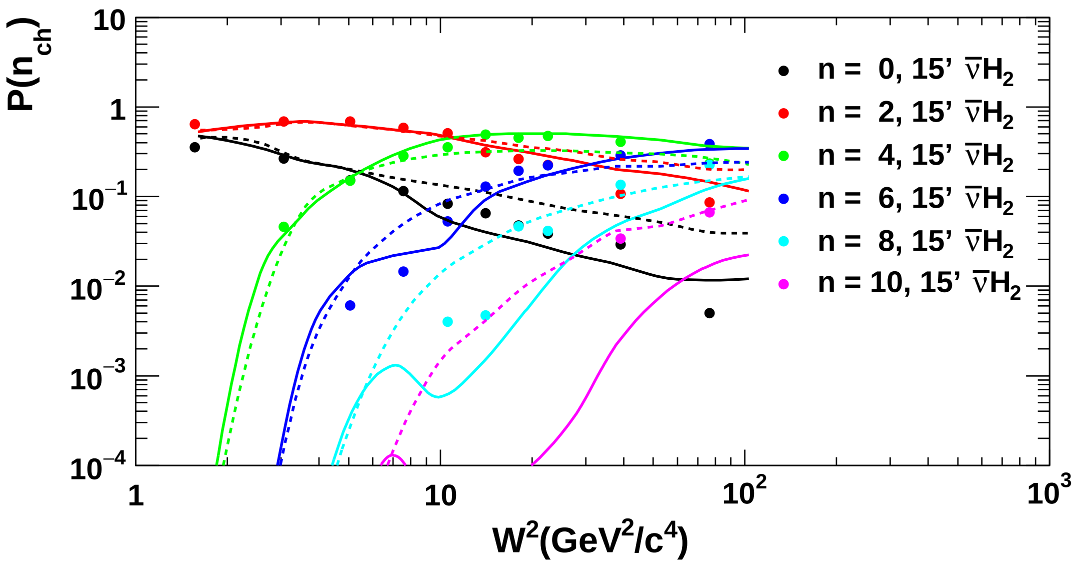
$<n_\eta>$
SKAT
νp G00_00a
νp G16_02a
W(GeV)
$<n_\eta>$
SKAT
νp G00_00a
νp G16_02a
$x_F>0$
W(GeV)

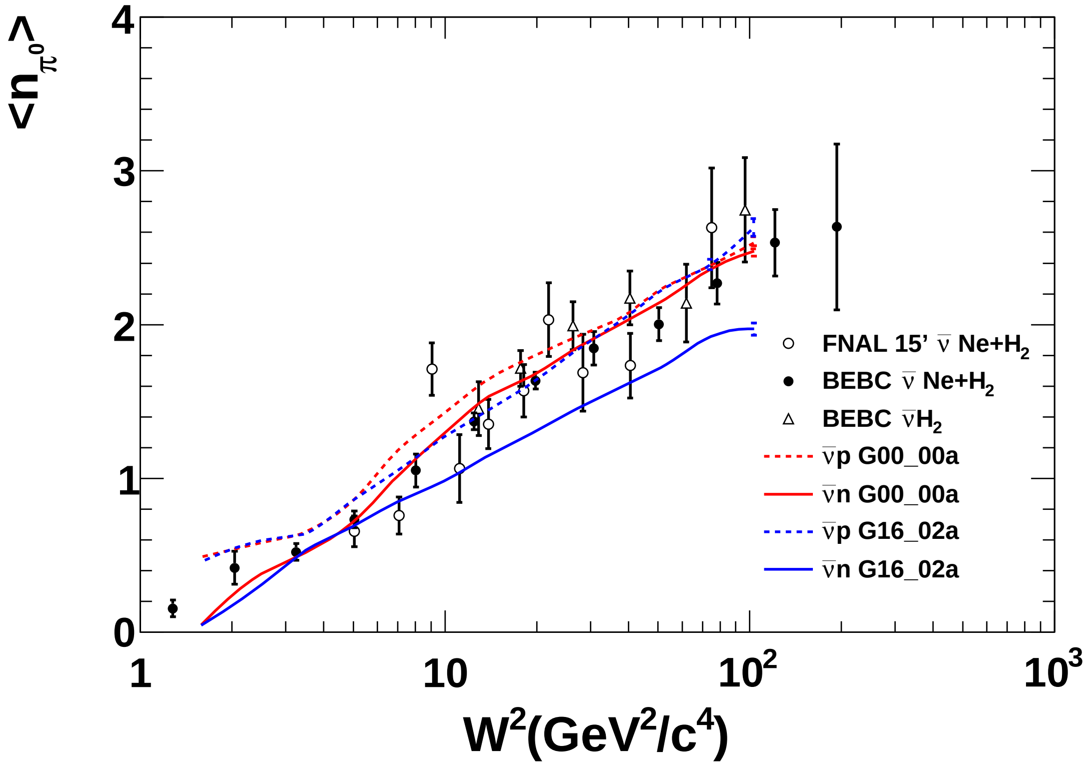


$<n_{ch}>$
$\bar{\nu}p \to \mu^+ X^0$
15' $\bar{\nu}H_2$
G00_00a
G16_02a
$W^2(GeV^2/c^4)$

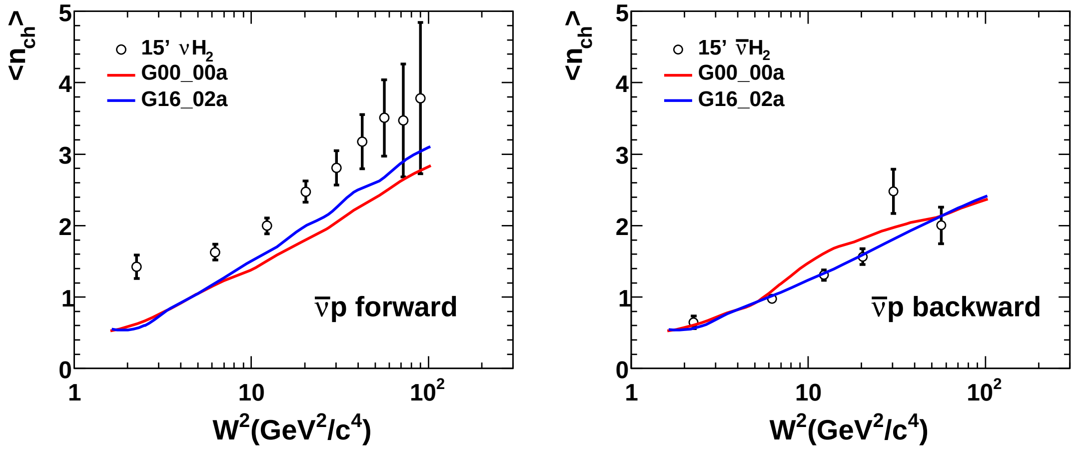


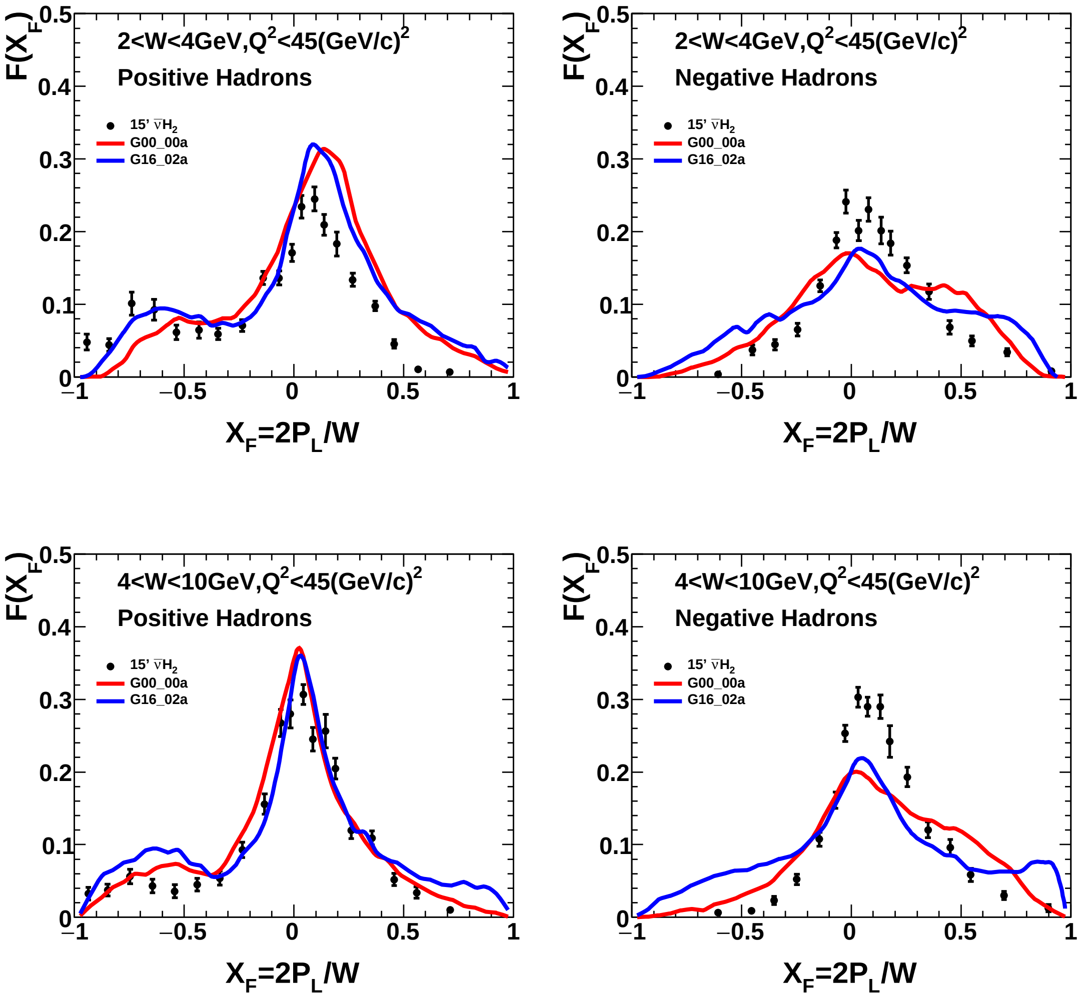
D₋
$\bar{\nu}p \rightarrow \mu^+ X^0$
15' $\bar{\nu}H_2$
G00_00a
G16_02a
<n₋>
0
0.5
1
1.5
2
0
1
2
3
4


P(n_ch)
10
1
10^-1
10^-2
10^-3
10^-4
1
10
10^2
10^3
W^2(GeV^2/c^4)
n = 0, 15' ν̄H_2
n = 2, 15' ν̄H_2
n = 4, 15' ν̄H_2
n = 6, 15' ν̄H_2
n = 8, 15' ν̄H_2
n = 10, 15' ν̄H_2

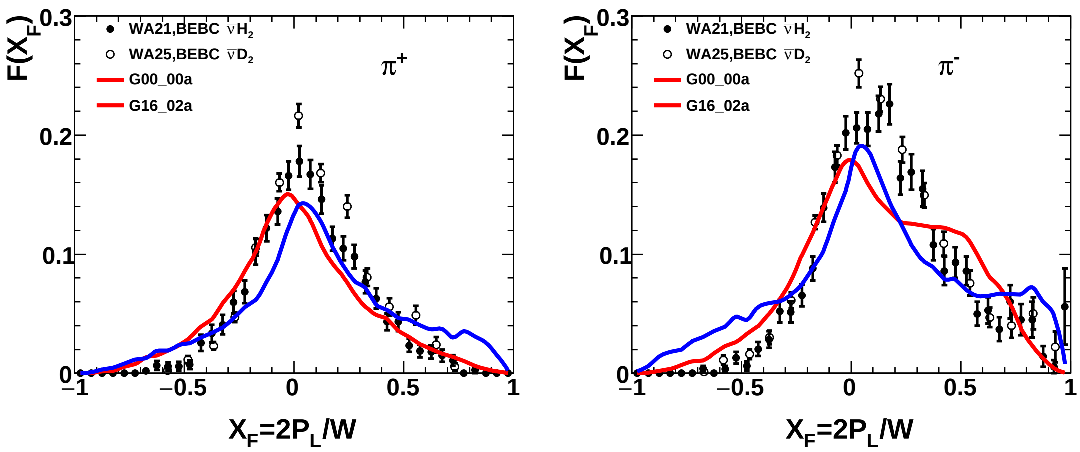


$<n_{\pi^0}>$
$W^2(GeV^2/c^4)$
1
10
10^2
10^3
0
1
2
3
4
FNAL 15' $\bar{\nu}$ Ne+H_2
BEBC $\bar{\nu}$ Ne+H_2
BEBC $\bar{\nu}H_2$
$\bar{\nu}$p G00_00a
$\bar{\nu}$n G00_00a
$\bar{\nu}$p G16_02a
$\bar{\nu}$n G16_02a

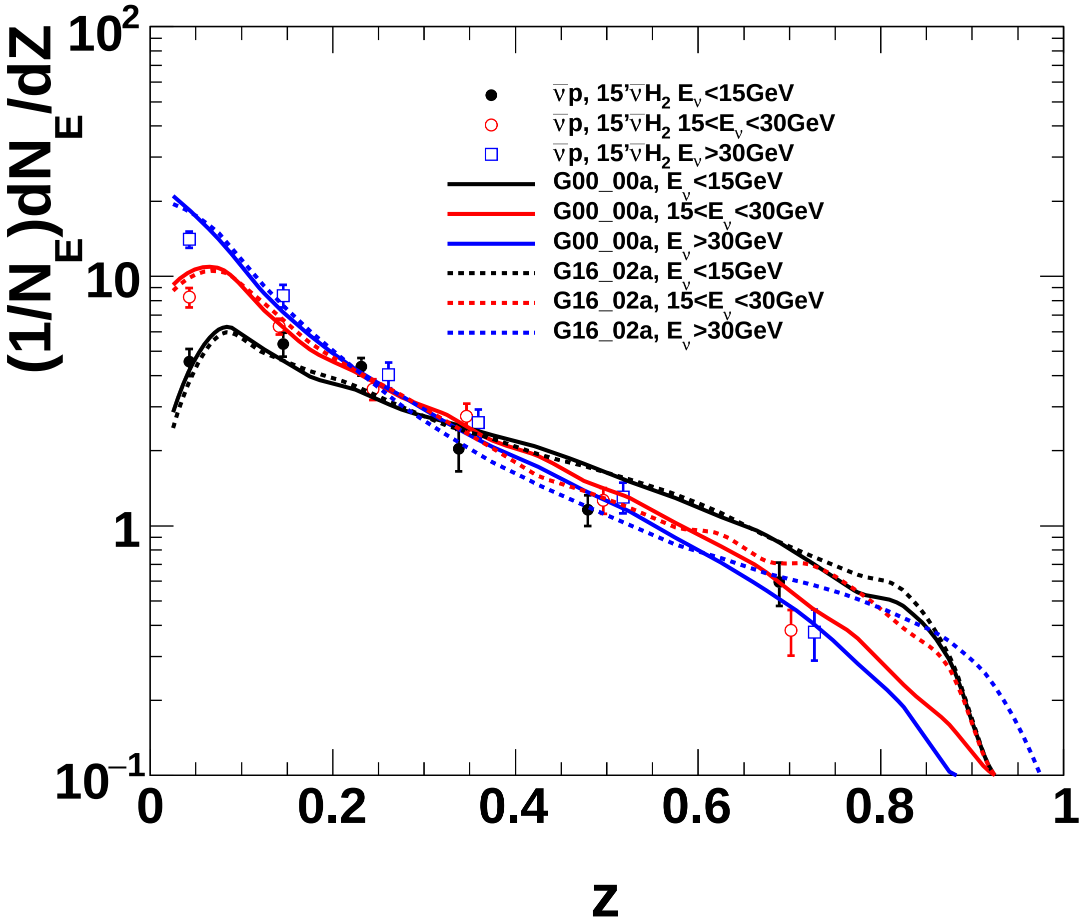

$\langle n_{ch} \rangle$
15' νH_2
G00_00a
G16_02a
$\bar{\nu}$p forward
$W^2(GeV^2/c^4)$
$\langle n_{ch} \rangle$
15' $\bar{\nu}H_2$
G00_00a
G16_02a
$\bar{\nu}$p backward
$W^2(GeV^2/c^4)$



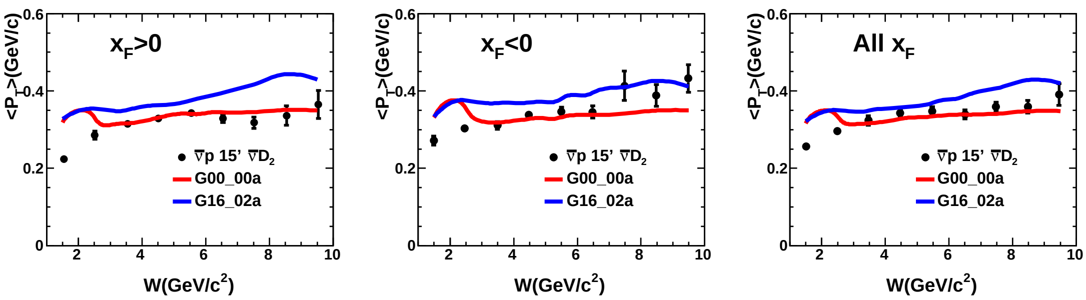
2<W<4GeV,Q²<45(GeV/c)²
Positive Hadrons
15' ν̄H₂
G00_00a
G16_02a
F(X_F)
X_F=2P_L/W
2<W<4GeV,Q²<45(GeV/c)²
Negative Hadrons
4<W<10GeV,Q²<45(GeV/c)²
Positive Hadrons
4<W<10GeV,Q²<45(GeV/c)²
Negative Hadrons



F(X_F)
WA21,BEBC ν̄H2
WA25,BEBC ν̄D2
G00_00a
G16_02a
π+
π-
0.3
0.2
0.1
0
−1
−0.5
0
0.5
1
X_F=2P_L/W



$(1/N_E)dN_E/dZ$
10^2
10
1
10^{-1}
0
0.2
0.4
0.6
0.8
1
z
$\bar{\nu}p$, 15'$\bar{\nu}H_2$ E_ν<15GeV
$\bar{\nu}p$, 15'$\bar{\nu}H_2$ 15<E_ν<30GeV
$\bar{\nu}p$, 15'$\bar{\nu}H_2$ E_ν>30GeV
G00_00a, E_ν<15GeV
G00_00a, 15<E_ν<30GeV
G00_00a, E_ν>30GeV
G16_02a, E_ν<15GeV
G16_02a, 15<E_ν<30GeV
G16_02a, E_ν>30GeV



x_F>0
x_F<0
All x_F
<P_T>(GeV/c)
W(GeV/c^2)
0.6
0.4
0.2
0
2
4
6
8
10
∇p 15’ ∇D2
G00_00a
G16_02a