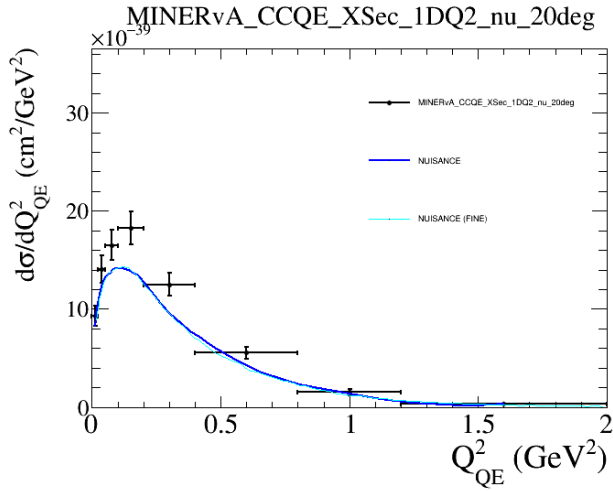


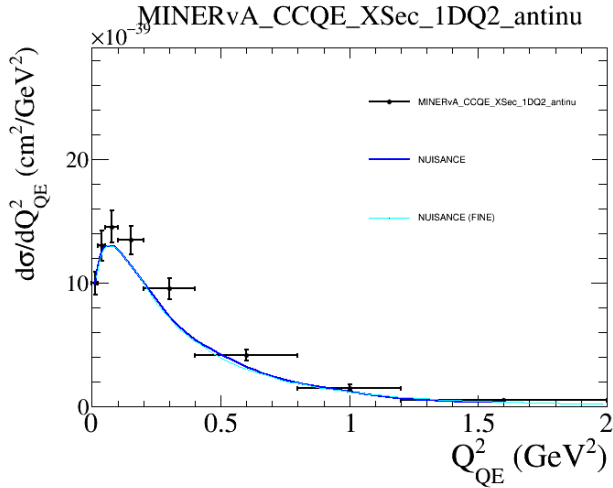
MINERvA\_CCQE\_XSec\_1DQ2\_nu\_settings

- **name** : MINERvA\_CCQE\_XSec\_1DQ2\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCQE\_XSec\_1DQ2\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current Numu  
 ↳-> Signal: True CCQE/2p2h defined at the vertex level
- **xtitle** :  $Q_{QE}^2$  (GeV<sup>2</sup>)
- **ytitle** :  $d\sigma/dQ_{QE}^2$  (cm<sup>2</sup>/GeV<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCQE\_XSec\_1DQ2\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQE
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQ
- **originalname** : MINERvA\_CCQE\_XSec\_1DQ2\_nu
- $\chi^2$  : 19.3218
- **NDOF** : 8
- $\chi^2/NDOF$  : 2.41522



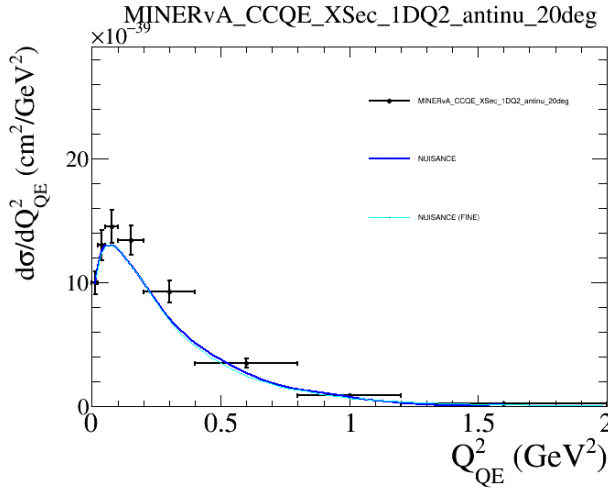
MINERvA\_CCQE\_XSec\_1DQ2\_nu\_20deg\_settings

- **name** : MINERvA\_CCQE\_XSec\_1DQ2\_nu\_20deg
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCQE\_XSec\_1DQ2\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current Numu  
 ↳-> Signal: True CCQE/2p2h defined at the vertex level
- **xtitle** :  $Q_{QE}^2$  (GeV<sup>2</sup>)
- **ytitle** :  $d\sigma/dQ_{QE}^2$  (cm<sup>2</sup>/GeV<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCQE\_XSec\_1DQ2\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQE
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQ
- **originalname** : MINERvA\_CCQE\_XSec\_1DQ2\_nu\_20deg
- $\chi^2$  : 19.5167
- **NDOF** : 8
- $\chi^2/NDOF$  : 2.43958



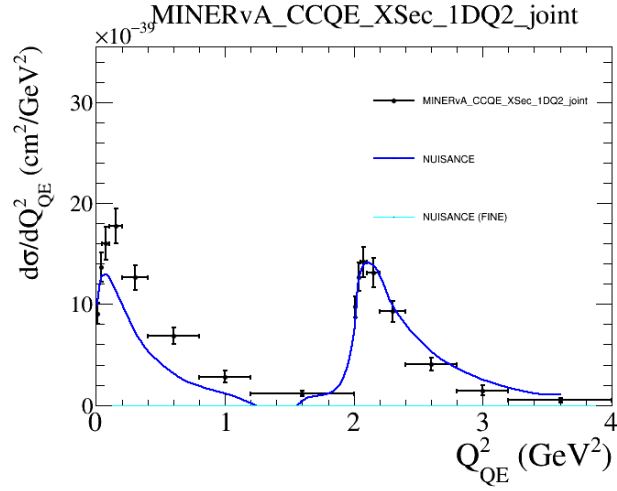
MINERvA\_CCQE\_XSec\_1DQ2\_antinu\_settings

- **name** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCQE\_XSec\_1DQ2\_antinu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current Numubar  
 ↳-> Signal: True CCQE/2p2h defined at the vertex level
- **xtitle** :  $Q_{QE}^2$  (GeV<sup>2</sup>)
- **ytitle** :  $d\sigma/dQ_{QE}^2$  (cm<sup>2</sup>/GeV<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQE
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQ
- **originalname** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu
- $\chi^2$  : 19.9113
- **NDOF** : 8
- $\chi^2/NDOF$  : 2.48891



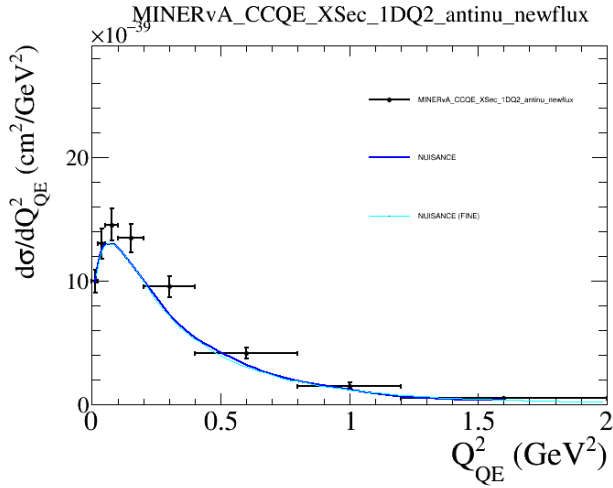
MINERvA\_CCQE\_XSec\_1DQ2\_antinu\_20deg\_settings

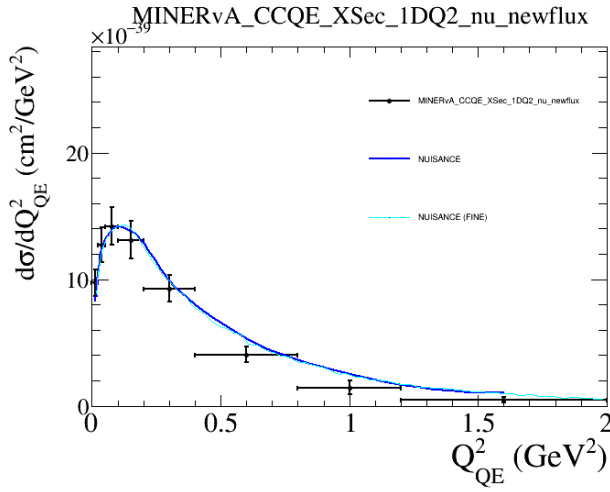
- **name** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu\_20deg
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCQE\_XSec\_1DQ2\_antinu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current Numubar  
 ↳ Signal: True CCQE/2p2h defined at the vertex level
- **xtitle** :  $Q_{QE}^2$  (GeV<sup>2</sup>)
- **ytitle** :  $d\sigma/dQ_{QE}^2$  (cm<sup>2</sup>/GeV<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQE
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQ
- **originalname** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu\_20deg
- $\chi^2$  : 19.6425
- **NDOF** : 8
- $\chi^2/NDOF$  : 2.45532



MINERvA\_CCQE\_XSec\_1DQ2\_antinu\_newflux\_settings

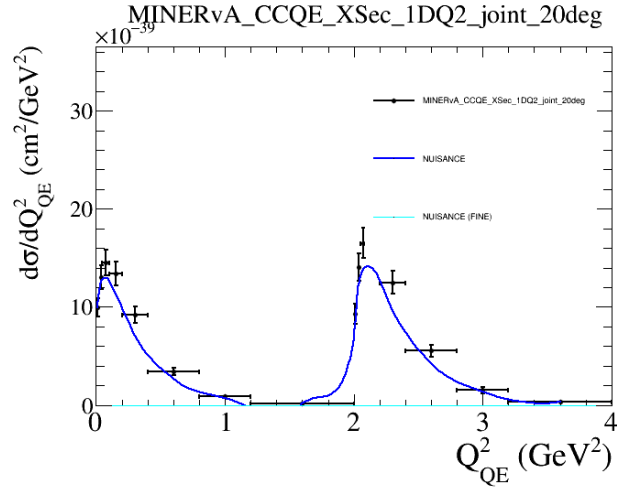
- **name** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu\_newflux
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCQE\_XSec\_1DQ2\_antinu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current Numubar  
 ↳ Signal: True CCQE/2p2h defined at the vertex level
- **xtitle** :  $Q_{QE}^2$  (GeV<sup>2</sup>)
- **ytitle** :  $d\sigma/dQ_{QE}^2$  (cm<sup>2</sup>/GeV<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQE
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQ
- **originalname** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu\_newflux
- $\chi^2$  : 19.9113
- **NDOF** : 8
- $\chi^2/NDOF$  : 2.48891





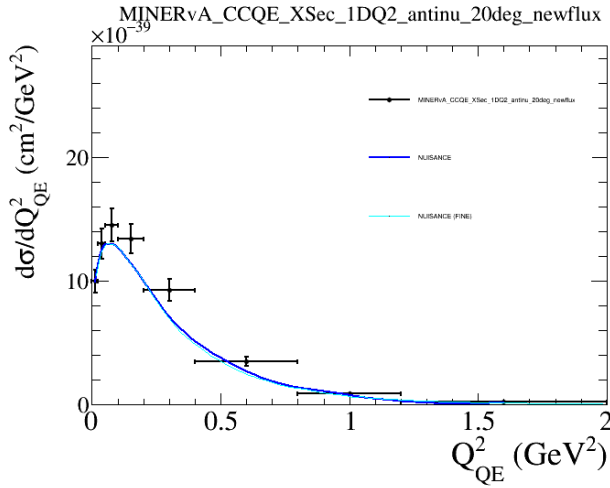
MINERvA\_CCQE\_XSec\_1DQ2\_nu\_newflux\_settings

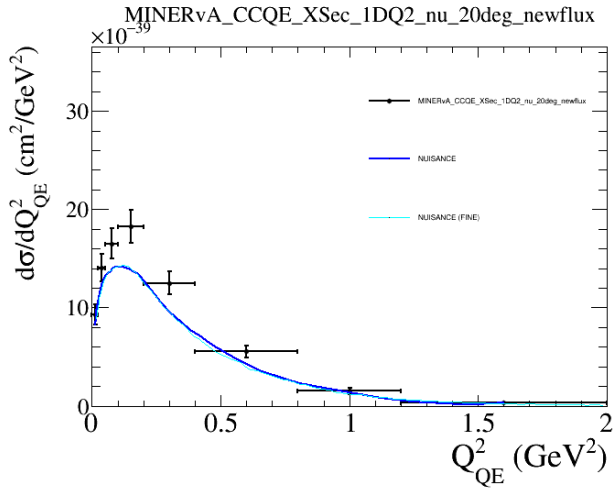
- **name** : MINERvA\_CCQE\_XSec\_1DQ2\_nu\_newflux
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCQE\_XSec\_1DQ2\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current Numu  
 ↳-> Signal: True CCQE/2p2h defined at the vertex level
- **xtitle** :  $Q_{QE}^2$  (GeV<sup>2</sup>)
- **ytitle** :  $d\sigma/dQ_{QE}^2$  (cm<sup>2</sup>/GeV<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCQE\_XSec\_1DQ2\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQE
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQ
- **originalname** : MINERvA\_CCQE\_XSec\_1DQ2\_nu\_newflux
- $\chi^2$  : 19.3218
- **NDOF** : 8
- $\chi^2/NDOF$  : 2.41522



MINERvA\_CCQE\_XSec\_1DQ2\_antinu\_20deg\_newflux\_settings

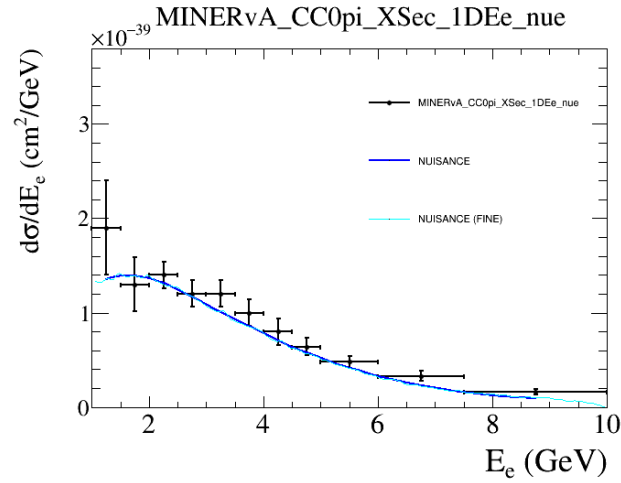
- **name** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu\_20deg\_newflux
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCQE\_XSec\_1DQ2\_antinu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current Numubar  
 ↳-> Signal: True CCQE/2p2h defined at the vertex level
- **xtitle** :  $Q_{QE}^2$  (GeV<sup>2</sup>)
- **ytitle** :  $d\sigma/dQ_{QE}^2$  (cm<sup>2</sup>/GeV<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQE
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCQ
- **originalname** : MINERvA\_CCQE\_XSec\_1DQ2\_antinu\_20deg\_newflux
- $\chi^2$  : 19.6425
- **NDOF** : 8
- $\chi^2/NDOF$  : 2.45532





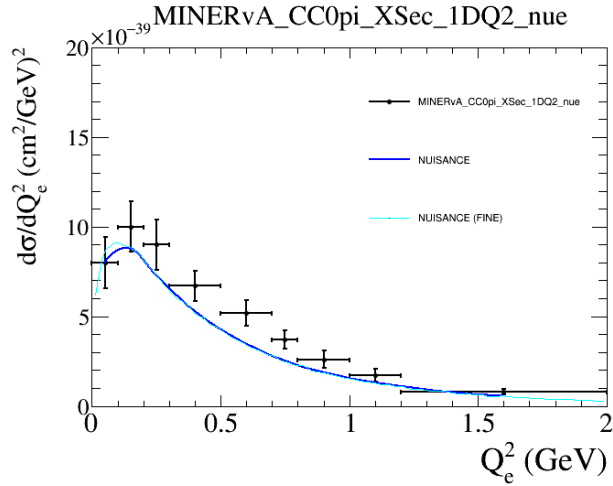
MINERvA\_CCQE\_XSec\_1DQ2\_nu\_20deg\_newflux\_settings

- **name** : MINERvA\_CCQE\_XSec\_1DQ2\_nu\_20deg\_newflux
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_nu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCQE\_XSec\_1DQ2\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current Numu  
 ↳-> Signal: True CCQE/2p2h defined at the vertex level
- **xtitle** :  $Q^2_{QE}$  (GeV<sup>2</sup>)
- **ytitle** :  $d\sigma/dQ^2_{QE}$  (cm<sup>2</sup>/GeV<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCQE\_XSec\_1DQ2\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data//MINERvA/CCQE
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data//MINERvA/CCQE
- **originalname** : MINERvA\_CCQE\_XSec\_1DQ2\_nu\_20deg\_newflux
- $\chi^2$  : 19.5167
- **NDOF** : 8
- $\chi^2/NDOF$  : 2.43958



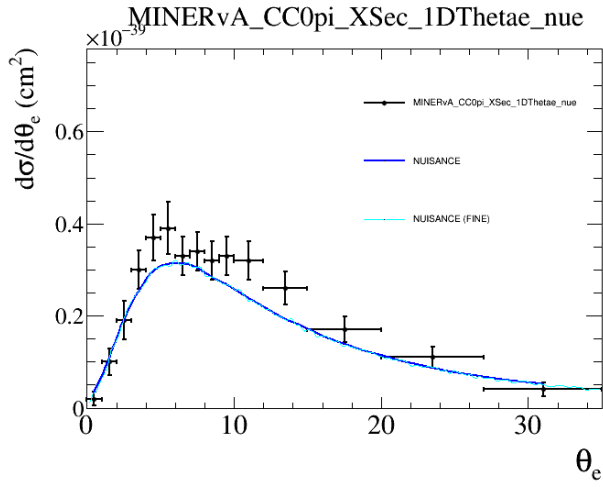
MINERvA\_CC0pi\_XSec\_1DEe\_nue\_settings

- **name** : MINERvA\_CC0pi\_XSec\_1DEe\_nue
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_nue.CH.2500000.3.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA CC0pi nue Ee sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $E_e$  (GeV)
- **ytitle** :  $d\sigma/dE_e$  (cm<sup>2</sup>/GeV)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 0
- **enu\_max** : 10
- **title** : MINERvA v\_e CC0π
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data//MINERvA/CC0pi
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data//MINERvA/CC0pi
- **originalname** : MINERvA\_CC0pi\_XSec\_1DEe\_nue
- $\chi^2$  : 0.95264
- **NDOF** : 11
- $\chi^2/NDOF$  : 0.0866036



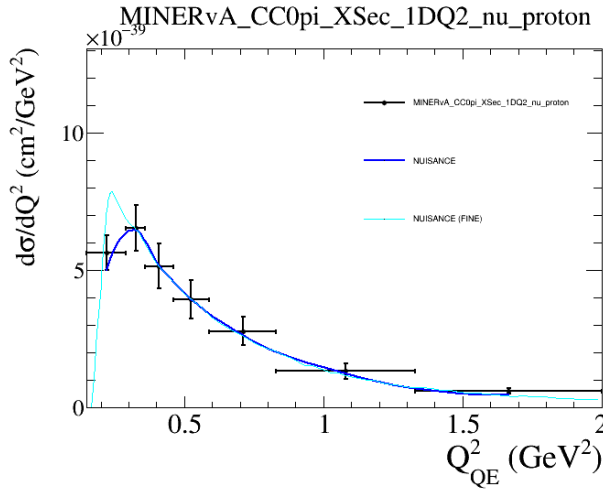
MINERvA\_CC0pi\_XSec\_1DQ2\_nue\_settings

- **name** : MINERvA\_CC0pi\_XSec\_1DQ2\_nue
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_nue.CH.2500000.3.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CC0pi\_XSec\_1DQ2\_nue sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $Q^2_e$  (GeV)
- **ytitle** :  $d\sigma/dQ^2_e$  (cm<sup>2</sup>/GeV<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 0
- **enu\_max** : 10
- **title** : MINERvA\_CC0pi\_XSec\_1DQ2\_nue
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data//MINERvA/CC0pi
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data//MINERvA/CC0pi
- **originalname** : MINERvA\_CC0pi\_XSec\_1DQ2\_nue
- $\chi^2$  : 0.99699
- **NDOF** : 9
- $\chi^2/NDOF$  : 0.110777



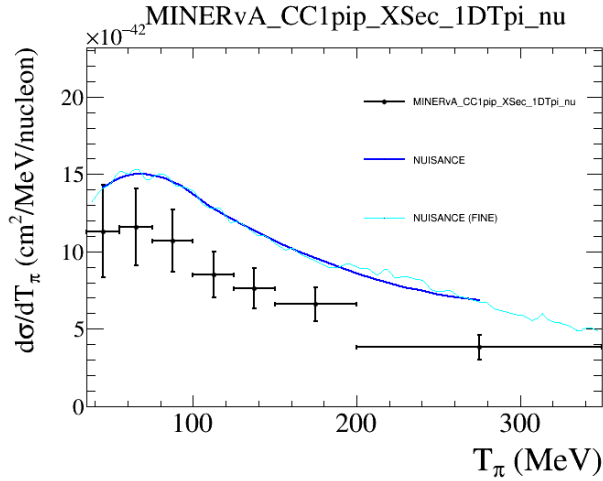
MINERvA\_CC0pi\_XSec\_1DThetae\_nue\_settings

- **name** : MINERvA\_CC0pi\_XSec\_1DThetae\_nue
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_nue.CH.2500000.3.prepared.n
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CC0pi\_XSec\_1DThetae\_nue sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_e$
- **ytitle** :  $d\sigma/d\theta_e$  (cm<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 0
- **enu\_max** : 10
- **title** : MINERvA v\_e CC0π
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC0pi
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC0pi
- **originalname** : MINERvA\_CC0pi\_XSec\_1DThetae\_nue
- $\chi^2$  : 1.30294
- **NDOF** : 15
- $\chi^2/NDOF$  : 0.0868625



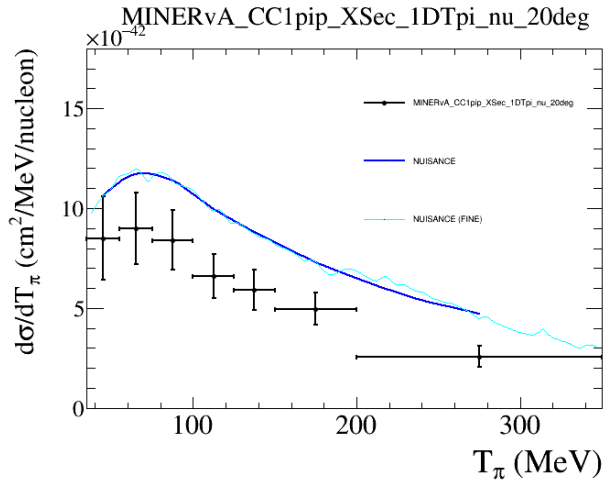
MINERvA\_CC0pi\_XSec\_1DQ2\_nu\_proton\_settings

- **name** : MINERvA\_CC0pi\_XSec\_1DQ2\_nu\_proton
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_nu.CH.2500000.1.prepared.n
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CC0pi\_XSec\_1DQ2\_nu\_proton sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $Q_{QE}^2$  (GeV<sup>2</sup>)
- **ytitle** :  $d\sigma/dQ^2$  (cm<sup>2</sup>/GeV<sup>2</sup>)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 0
- **enu\_max** : 100
- **title** : MINERvA\_CC0pi\_XSec\_1DQ2\_nu\_proton
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC0pi
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC0pi
- **originalname** : MINERvA\_CC0pi\_XSec\_1DQ2\_nu\_proton
- $\chi^2$  : 7.63844
- **NDOF** : 7
- $\chi^2/NDOF$  : 1.09121



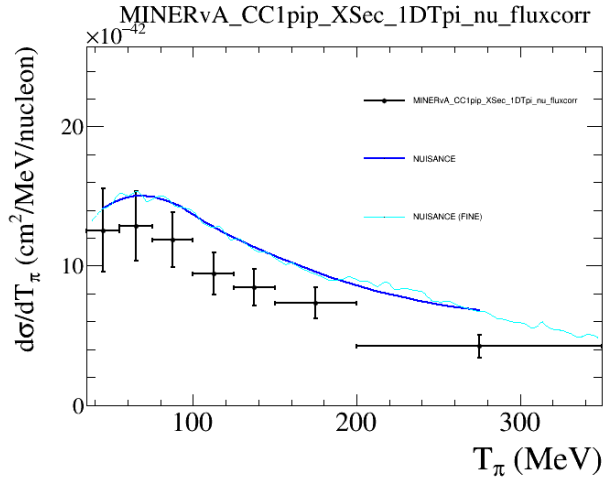
MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_nu.CH.2500000.1.prepared.n
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CC1pip\_XSec\_1DTpi\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $T_\pi$  (MeV)
- **ytitle** :  $d\sigma/dT_\pi$  (cm<sup>2</sup>/MeV/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **originalname** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu
- $\chi^2$  : 22.0665
- **NDOF** : 7
- $\chi^2/NDOF$  : 3.15236



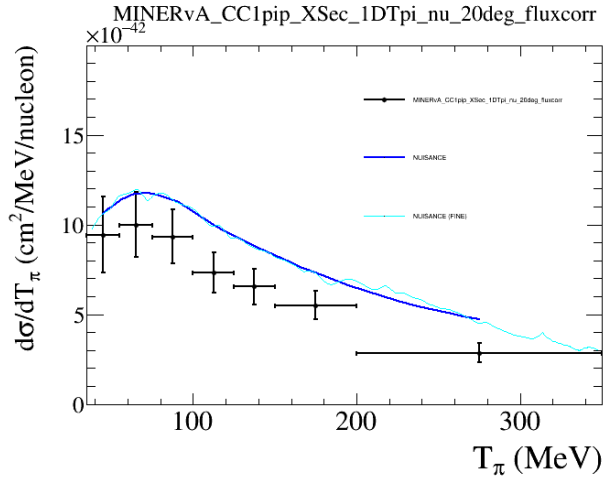
MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_20deg\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_20deg
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CC1pip\_XSec\_1DTpi\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $T_\pi$  (MeV)
- **ytitle** :  $d\sigma/dT_\pi$  (cm<sup>2</sup>/MeV/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **originalname** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_20deg
- $\chi^2$  : 22.8941
- **NDOF** : 7
- $\chi^2/\text{NDOF}$  : 3.27058



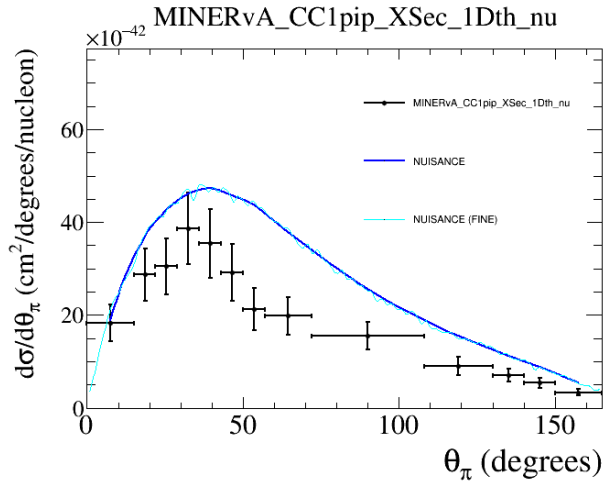
MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_fluxcorr\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CC1pip\_XSec\_1DTpi\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $T_\pi$  (MeV)
- **ytitle** :  $d\sigma/dT_\pi$  (cm<sup>2</sup>/MeV/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **originalname** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_fluxcorr
- $\chi^2$  : 19.3819
- **NDOF** : 7
- $\chi^2/\text{NDOF}$  : 2.76885



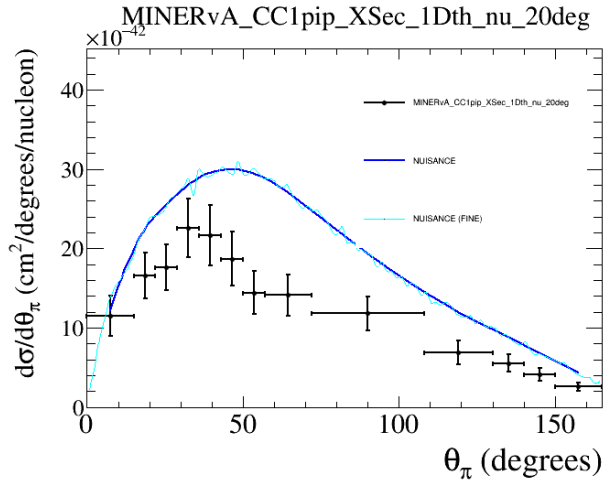
MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_20deg\_fluxcorr\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_20deg\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CC1pip\_XSec\_1DTpi\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $T_\pi$  (MeV)
- **ytitle** :  $d\sigma/dT_\pi$  (cm<sup>2</sup>/MeV/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **originalname** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_20deg\_fluxcorr
- $\chi^2$  : 20.0449
- **NDOF** : 7
- $\chi^2/\text{NDOF}$  : 2.86355



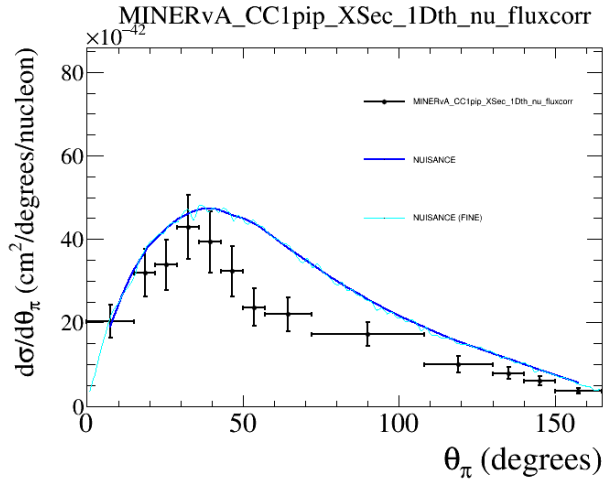
MINERvA\_CC1pip\_XSec\_1Dth\_nu\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1Dth\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CC1pip\_XSec\_1Dth\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuubar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $d\sigma/d\theta_\pi$  (cm<sup>2</sup>/degrees/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pip\_XSec\_1Dth\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **originalname** : MINERvA\_CC1pip\_XSec\_1Dth\_nu
- $\chi^2$  : 104.614
- **NDOF** : 13
- $\chi^2/\text{NDOF}$  : 8.04719



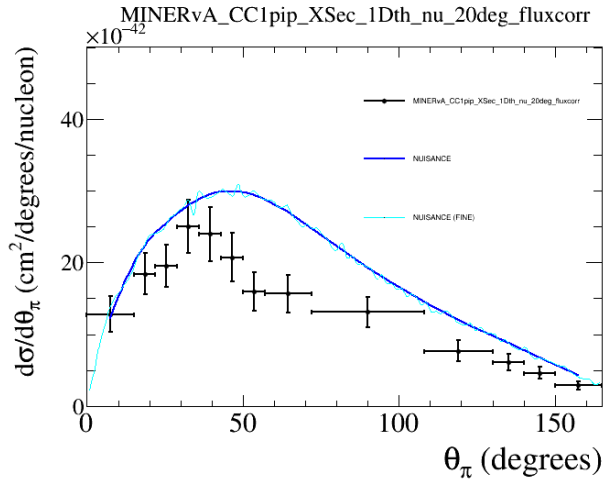
MINERvA\_CC1pip\_XSec\_1Dth\_nu\_20deg\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1Dth\_nu\_20deg
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CC1pip\_XSec\_1Dth\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuubar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $d\sigma/d\theta_\pi$  (cm<sup>2</sup>/degrees/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pip\_XSec\_1Dth\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **originalname** : MINERvA\_CC1pip\_XSec\_1Dth\_nu\_20deg
- $\chi^2$  : 89.2499
- **NDOF** : 13
- $\chi^2/\text{NDOF}$  : 6.86537



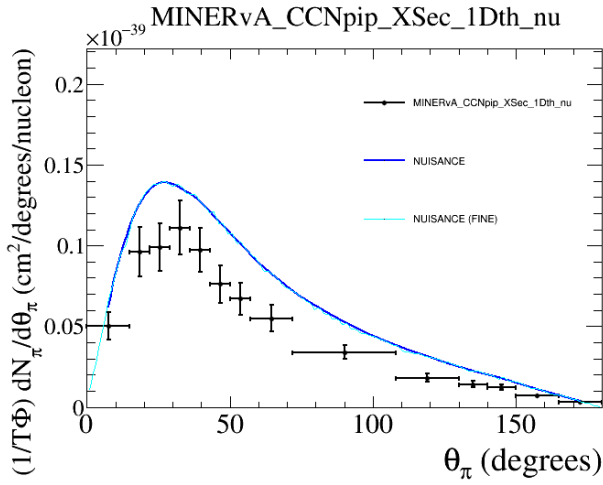
MINERvA\_CC1pip\_XSec\_1Dth\_nu\_fluxcorr\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1Dth\_nu\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CC1pip\_XSec\_1Dth\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuubar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $d\sigma/d\theta_\pi$  (cm<sup>2</sup>/degrees/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pip\_XSec\_1Dth\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **originalname** : MINERvA\_CC1pip\_XSec\_1Dth\_nu\_fluxcorr
- $\chi^2$  : 100.929
- **NDOF** : 13
- $\chi^2/\text{NDOF}$  : 7.7638



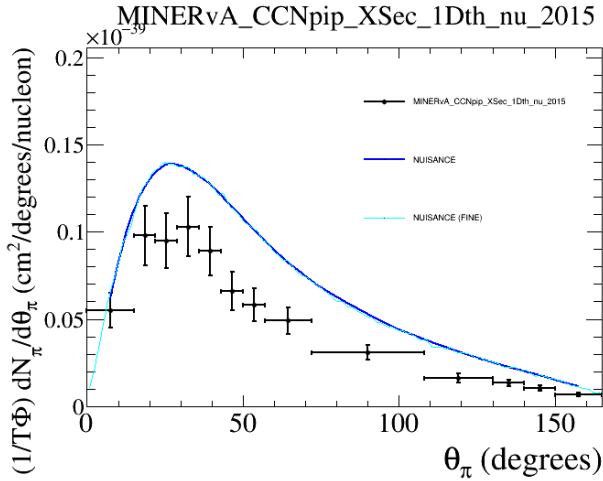
MINERvA\_CC1pip\_XSec\_1Dth\_nu\_20deg\_fluxcorr\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1Dth\_nu\_20deg\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CC1pip\_XSec\_1Dth\_nu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current nue + nuebar  
 |-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $d\sigma/d\theta_\pi$  (cm<sup>2</sup>/degrees/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pip\_XSec\_1Dth\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1p
- **originalname** : MINERvA\_CC1pip\_XSec\_1Dth\_nu\_20deg\_fluxcorr
- $\chi^2$  : 86.3164
- **NDOF** : 13
- $\chi^2/\text{NDOF}$  : 6.63972



MINERvA\_CCNpip\_XSec\_1Dth\_nu\_settings

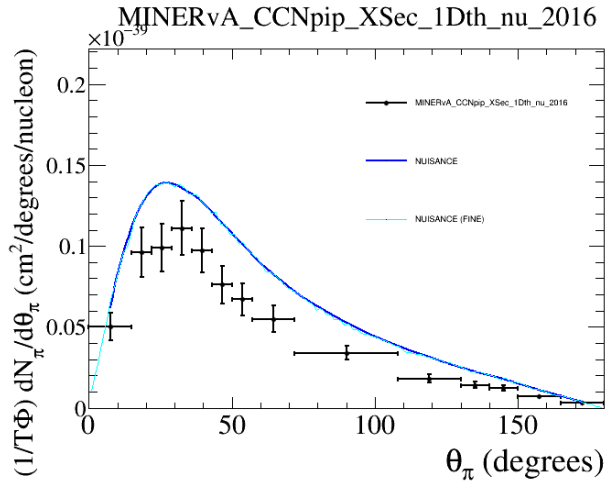
- **name** : MINERvA\_CCNpip\_XSec\_1Dth\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CCNpip\_XSec\_1Dth\_nu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current nue + nuebar  
 |-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $(1/T\Phi) dN_\pi/d\theta_\pi$  (cm<sup>2</sup>/degrees/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1Dth\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1Dth\_nu
- $\chi^2$  : 52.9607
- **NDOF** : 14
- $\chi^2/\text{NDOF}$  : 3.7829



MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015\_settings

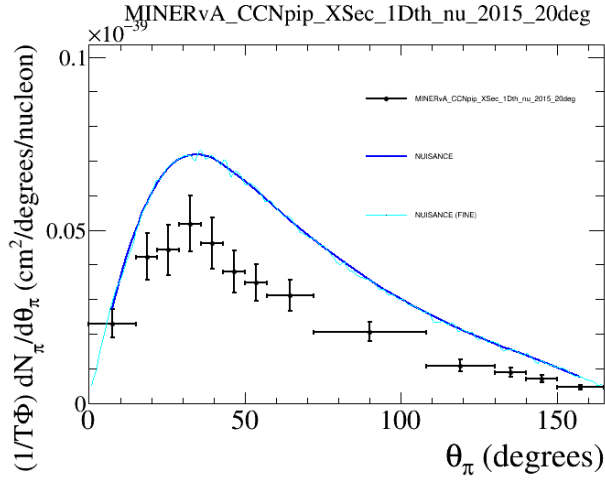
- **name** : MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CCNpip\_XSec\_1Dth\_nu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current nue + nuebar  
 |-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $(1/T\Phi) dN_\pi/d\theta_\pi$  (cm<sup>2</sup>/degrees/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1Dth\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015
- $\chi^2$  : 80.6474
- **NDOF** : 13
- $\chi^2/\text{NDOF}$  : 6.20364





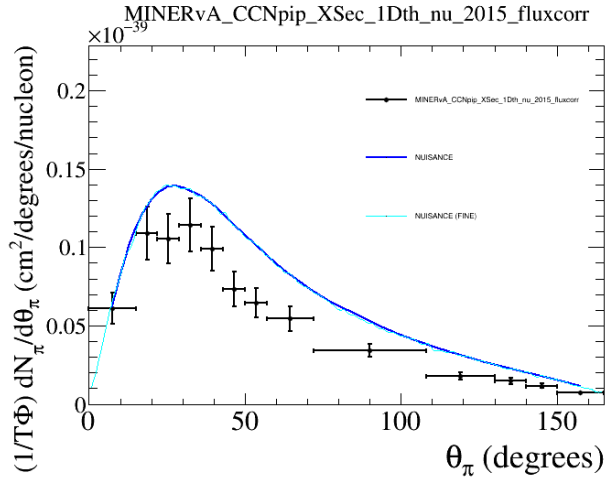
MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2016\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2016
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCNpip\_XSec\_1Dth\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_{\pi}$  (degrees)
- **ytitle** :  $(1/T\Phi) \frac{dN_{\pi}}{d\theta_{\pi}} \text{ (cm}^2\text{/degrees/nucleon)}$
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1Dth\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2016
- $\chi^2$  : 52.9607
- **NDOF** : 14
- $\chi^2/\text{NDOF}$  : 3.7829



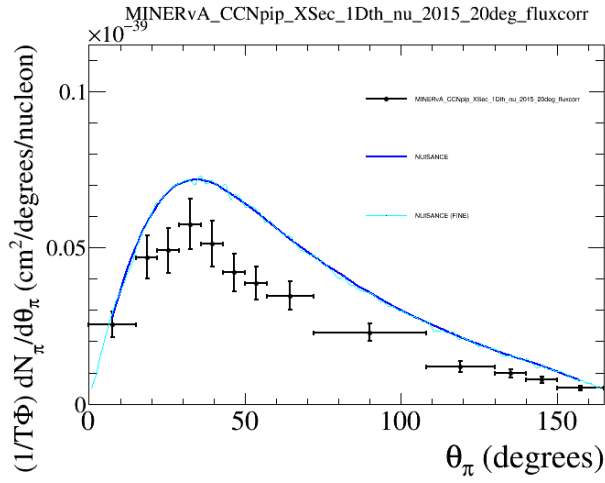
MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015\_20deg\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015\_20deg
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCNpip\_XSec\_1Dth\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_{\pi}$  (degrees)
- **ytitle** :  $(1/T\Phi) \frac{dN_{\pi}}{d\theta_{\pi}} \text{ (cm}^2\text{/degrees/nucleon)}$
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1Dth\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015\_20deg
- $\chi^2$  : 85.1578
- **NDOF** : 13
- $\chi^2/\text{NDOF}$  : 6.5506



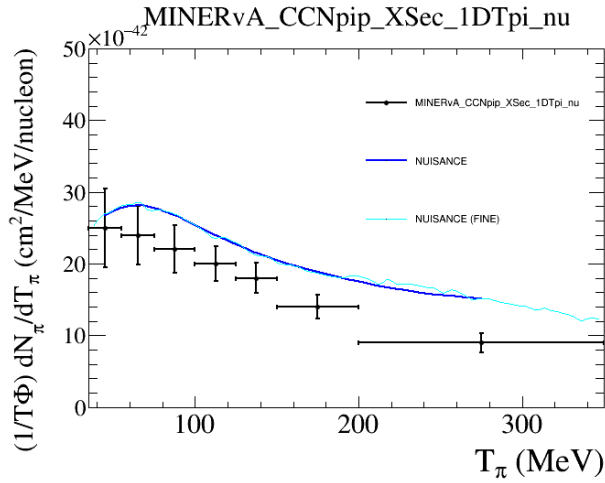
MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015\_fluxcorr\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCNpip\_XSec\_1Dth\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_{\pi}$  (degrees)
- **ytitle** :  $(1/T\Phi) \frac{dN_{\pi}}{d\theta_{\pi}} \text{ (cm}^2\text{/degrees/nucleon)}$
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1Dth\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015\_fluxcorr
- $\chi^2$  : 72.6073
- **NDOF** : 13
- $\chi^2/\text{NDOF}$  : 5.58517



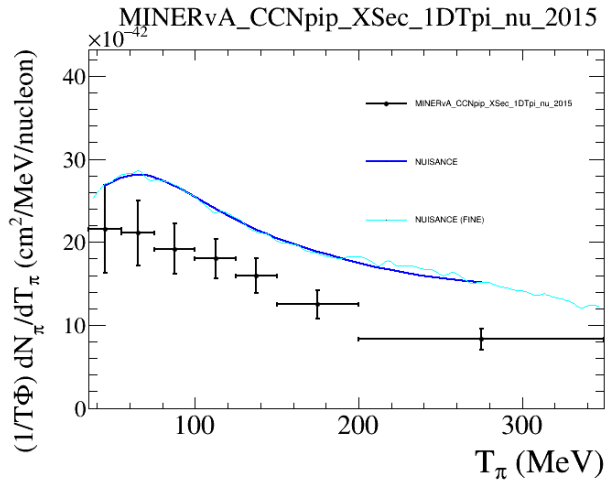
MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015\_20deg\_fluxcorr\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015\_20deg\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCNpip\_XSec\_1Dth\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $(1/T\Phi) dN_\pi/d\theta_\pi$  (cm²/degrees/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1Dth\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1Dth\_nu\_2015\_20deg\_fluxcorr
- $\chi^2$  : 75.422
- **NDOF** : 13
- $\chi^2/NDOF$  : 5.80169



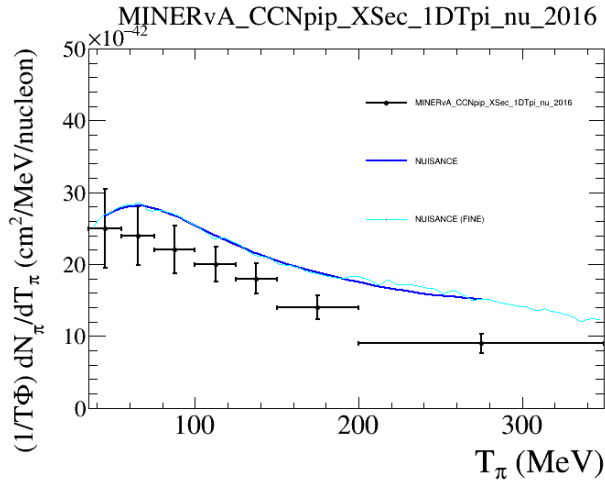
MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCNpip\_XSec\_1DTpi\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $T_\pi$  (MeV)
- **ytitle** :  $(1/T\Phi) dN_\pi/dT_\pi$  (cm²/MeV/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu
- $\chi^2$  : 29.5758
- **NDOF** : 7
- $\chi^2/NDOF$  : 4.22511



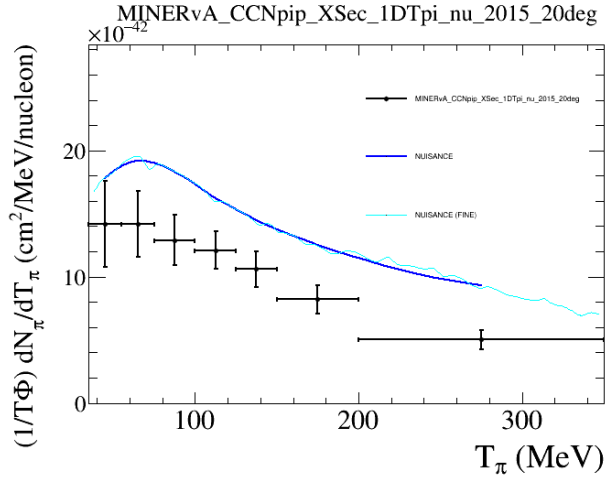
MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCNpip\_XSec\_1DTpi\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $T_\pi$  (MeV)
- **ytitle** :  $(1/T\Phi) dN_\pi/dT_\pi$  (cm²/MeV/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015
- $\chi^2$  : 35.4956
- **NDOF** : 7
- $\chi^2/NDOF$  : 5.07079



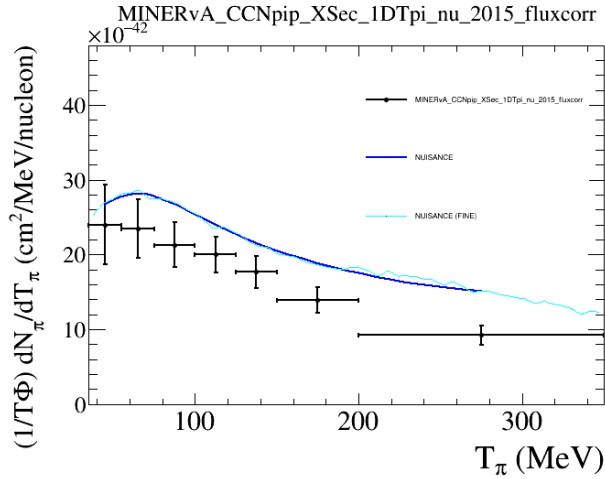
MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2016\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2016
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCNpip\_XSec\_1DTpi\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $T_{\pi} \text{ (MeV)}$
- **ytitle** :  $(1/T\Phi) dN_{\pi}/dT_{\pi} \text{ (cm}^2/\text{MeV/nucleon)}$
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2016
- $\chi^2$  : 29.5758
- **NDOF** : 7
- $\chi^2/\text{NDOF}$  : 4.22511



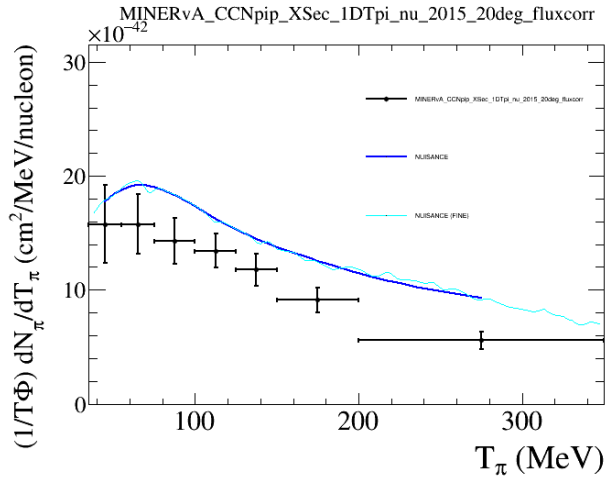
MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015\_20deg\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015\_20deg
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCNpip\_XSec\_1DTpi\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $T_{\pi} \text{ (MeV)}$
- **ytitle** :  $(1/T\Phi) dN_{\pi}/dT_{\pi} \text{ (cm}^2/\text{MeV/nucleon)}$
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015\_20deg
- $\chi^2$  : 41.2664
- **NDOF** : 7
- $\chi^2/\text{NDOF}$  : 5.89519



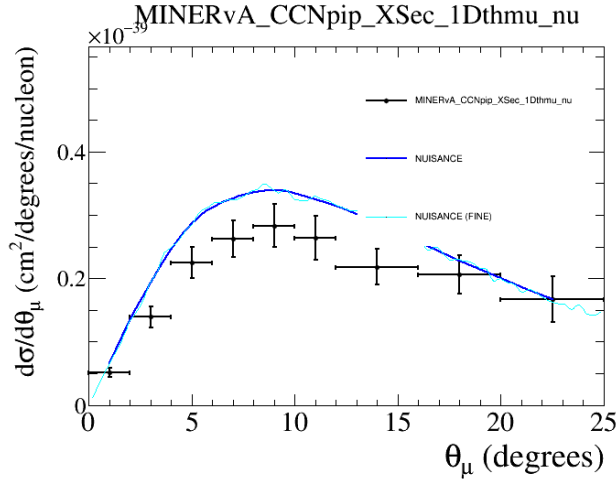
MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015\_fluxcorr\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCNpip\_XSec\_1DTpi\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuebar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $T_{\pi} \text{ (MeV)}$
- **ytitle** :  $(1/T\Phi) dN_{\pi}/dT_{\pi} \text{ (cm}^2/\text{MeV/nucleon)}$
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015\_fluxcorr
- $\chi^2$  : 31.391
- **NDOF** : 7
- $\chi^2/\text{NDOF}$  : 4.48442



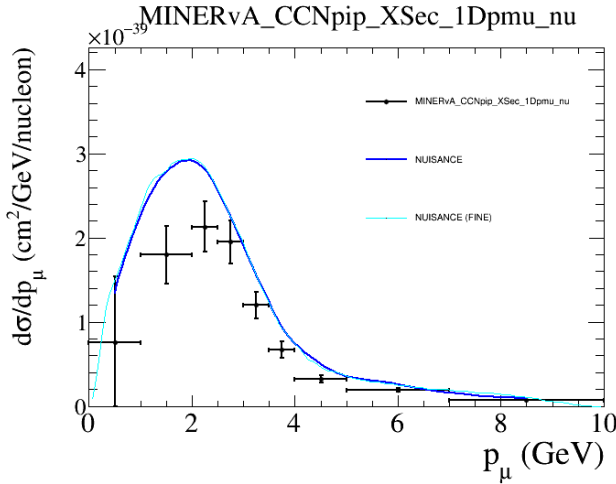
MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015\_20deg\_fluxcorr\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015\_20deg\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCNpip\_XSec\_1DTpi\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuubar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $T_\pi$  (MeV)
- **ytitle** :  $(1/T\Phi) dN_\pi/dT_\pi$  (cm<sup>2</sup>/MeV/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu
- **originalname** : MINERvA\_CCNpip\_XSec\_1DTpi\_nu\_2015\_20deg\_fluxcorr
- $\chi^2$  : 36.2671
- **NDOF** : 7
- $\chi^2/NDOF$  : 5.18101



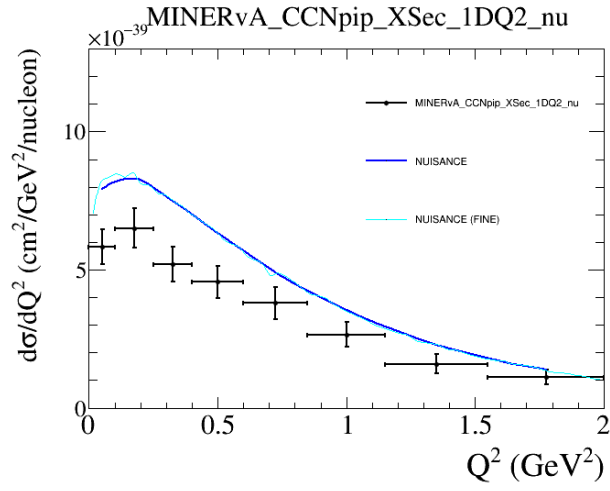
MINERvA\_CCNpip\_XSec\_1Dthmu\_nu\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1Dthmu\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCNpip\_XSec\_1Dthmu\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuubar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $\theta_\mu$  (degrees)
- **ytitle** :  $d\sigma/d\theta_\mu$  (cm<sup>2</sup>/degrees/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1Dthmu\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCNp
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCN
- **originalname** : MINERvA\_CCNpip\_XSec\_1Dthmu\_nu
- $\chi^2$  : 20.2469
- **NDOF** : 9
- $\chi^2/NDOF$  : 2.24966



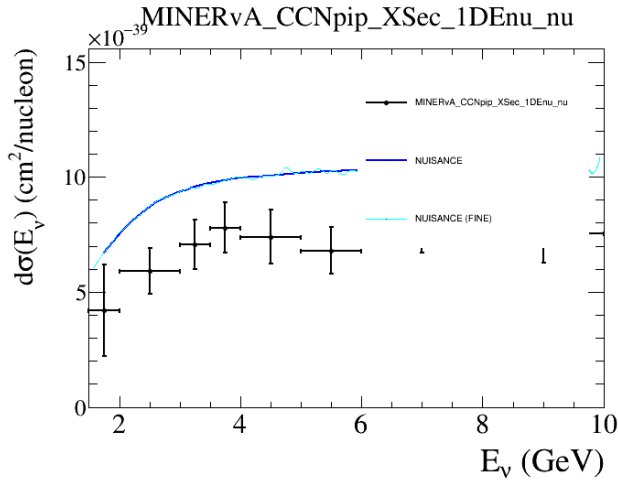
MINERvA\_CCNpip\_XSec\_1Dpmu\_nu\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1Dpmu\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCNpip\_XSec\_1Dpmu\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nue + nuubar  
 ↳ Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $p_\mu$  (GeV)
- **ytitle** :  $d\sigma/dp_\mu$  (cm<sup>2</sup>/GeV/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1Dpmu\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCNp
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCN
- **originalname** : MINERvA\_CCNpip\_XSec\_1Dpmu\_nu
- $\chi^2$  : 45.0958
- **NDOF** : 9
- $\chi^2/NDOF$  : 5.01064



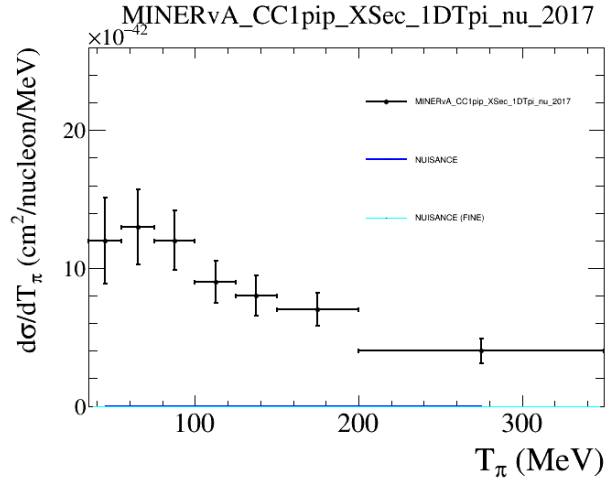
MINERvA\_CCNpip\_XSec\_1DQ2\_nu\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1DQ2\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCNpip\_XSec\_1DQ2\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuclbar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $Q^2$  (GeV<sup>2</sup>)
- **ytitle** :  $d\sigma/dQ^2$  (cm<sup>2</sup>/GeV<sup>2</sup>/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1DQ2\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCNp
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCN
- **originalname** : MINERvA\_CCNpip\_XSec\_1DQ2\_nu
- $\chi^2$  : 19.4362
- **NDOF** : 8
- $\chi^2/\text{NDOF}$  : 2.42953



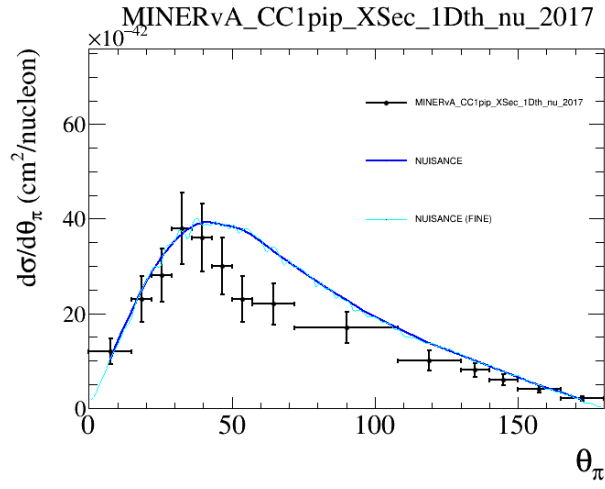
MINERvA\_CCNpip\_XSec\_1DEnu\_nu\_settings

- **name** : MINERvA\_CCNpip\_XSec\_1DEnu\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳-> MINERvA\_CCNpip\_XSec\_1DEnu\_nu sample.  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current nue + nuclbar  
 ↳-> Signal: Any event with 1 electron, any nucleons, and no other FS particles
- **xtitle** :  $E_\nu$  (GeV)
- **ytitle** :  $d\sigma(E_\nu)$  (cm<sup>2</sup>/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CCNpip\_XSec\_1DEnu\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCNp
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCN
- **originalname** : MINERvA\_CCNpip\_XSec\_1DEnu\_nu
- $\chi^2$  : 19.1013
- **NDOF** : 8
- $\chi^2/\text{NDOF}$  : 2.38766



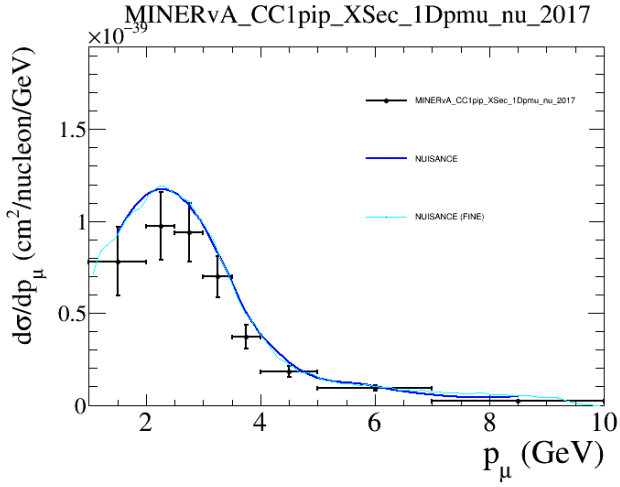
MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_2017\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_2017
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **description** :  
 ↳-> Target: CH  
 ↳-> Flux: MINERvA Forward Horn Current numu ONLY  
 ↳-> Signal: Any event with 1 muon, and 1pi+ or 1pi- in FS. W < 1.4
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pij
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1p
- **title** : CC1π Updated
- **xtitle** :  $T_\pi$  (MeV)
- **ytitle** :  $d\sigma/dT_\pi$  (cm<sup>2</sup>/nucleon/MeV)
- **originalname** : MINERvA\_CC1pip\_XSec\_1DTpi\_nu\_2017
- $\chi^2$  : 43.9648
- **NDOF** : 7
- $\chi^2/\text{NDOF}$  : 6.28069



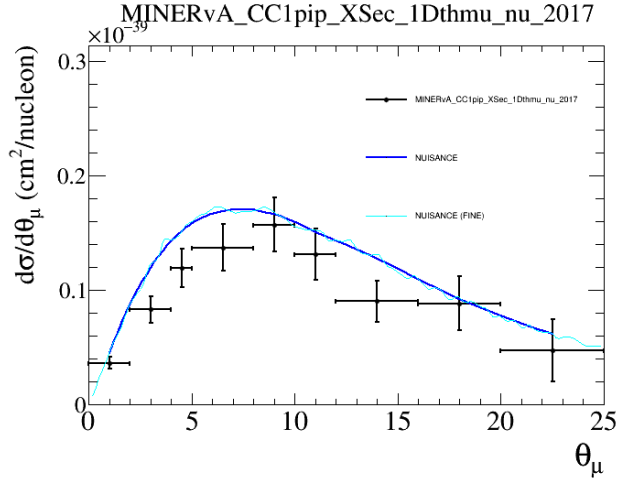
MINERvA\_CC1pip\_XSec\_1Dth\_nu\_2017\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1Dth\_nu\_2017
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_nu\_mu.CH.2500000.1.prepared
- **type** : DEFAULT
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **description** :  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nu\_mu ONLY  
 ↳ Signal: Any event with 1 muon, and 1pi+ or 1pi- in FS. W < 1.4
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1p
- **title** : CC1π Updated
- **xtitle** :  $\theta_\pi$
- **ytitle** :  $d\sigma/d\theta_\pi$  (cm<sup>2</sup>/nucleon)
- **originalname** : MINERvA\_CC1pip\_XSec\_1Dth\_nu\_2017
- $\chi^2$  : 77.0752
- **NDOF** : 14
- $\chi^2/\text{NDOF}$  : 5.50537



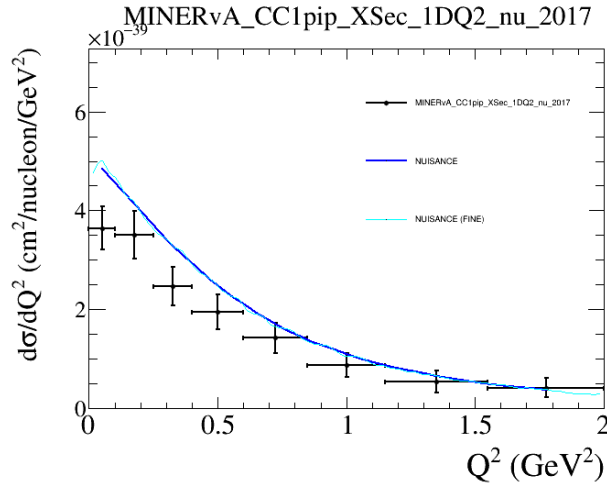
MINERvA\_CC1pip\_XSec\_1Dp\_mu\_nu\_2017\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1Dp\_mu\_nu\_2017
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_nu\_mu.CH.2500000.1.prepared
- **type** : DEFAULT
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **description** :  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nu\_mu ONLY  
 ↳ Signal: Any event with 1 muon, and 1pi+ or 1pi- in FS. W < 1.4
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1p
- **title** : CC1π Updated
- **xtitle** :  $p_\mu$  (GeV)
- **ytitle** :  $d\sigma/dp_\mu$  (cm<sup>2</sup>/nucleon/GeV)
- **originalname** : MINERvA\_CC1pip\_XSec\_1Dp\_mu\_nu\_2017
- $\chi^2$  : 18.6752
- **NDOF** : 8
- $\chi^2/\text{NDOF}$  : 2.33441



MINERvA\_CC1pip\_XSec\_1Dthmu\_nu\_2017\_settings

- **name** : MINERvA\_CC1pip\_XSec\_1Dthmu\_nu\_2017
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_nu\_mu.CH.2500000.1.prepared
- **type** : DEFAULT
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **description** :  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current nu\_mu ONLY  
 ↳ Signal: Any event with 1 muon, and 1pi+ or 1pi- in FS. W < 1.4
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pip
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1p
- **title** : CC1π Updated
- **xtitle** :  $\theta_\mu$
- **ytitle** :  $d\sigma/d\theta_\mu$  (cm<sup>2</sup>/nucleon)
- **originalname** : MINERvA\_CC1pip\_XSec\_1Dthmu\_nu\_2017
- $\chi^2$  : 31.4133
- **NDOF** : 9
- $\chi^2/\text{NDOF}$  : 3.49036

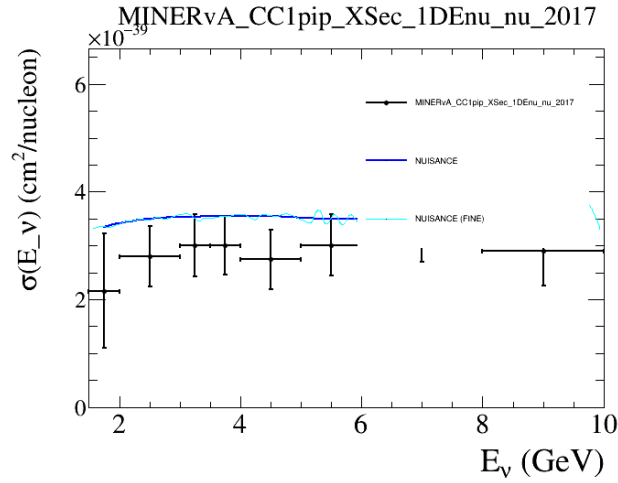


MINERvA\_CC1pip\_XSec\_1DQ2\_nu\_2017\_settings

```

• name : MINERvA_CC1pip_XSec_1DQ2_nu_2017
• input : GENIE:@GENIE_DIR/gntp.R-2_6_3.OfficialDefault.Default.MINERvA_fhc_nu_mu.CH.2500000.1.prepared
• type : DEFAULT
• default_types : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
• allowed_types : FIX/FULL
• enu_min : 1.5
• enu_max : 10
• description :
  |-> Target: CH
  |-> Flux: MINERvA Forward Horn Current nu_mu ONLY
  |-> Signal: Any event with 1 muon, and 1pi+ or 1pi- in FS. W < 1.4
• data : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pij
• covar : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pi
• title : CC1π Updated
• xtitle : Q² (GeV²)
• ytitle : dσ/dQ² (cm²/nucleon/GeV²)
• originalname : MINERvA_CC1pip_XSec_1DQ2_nu_2017
• χ² : 14.5928
• NDOF : 8
• χ²/NDOF : 1.82409

```

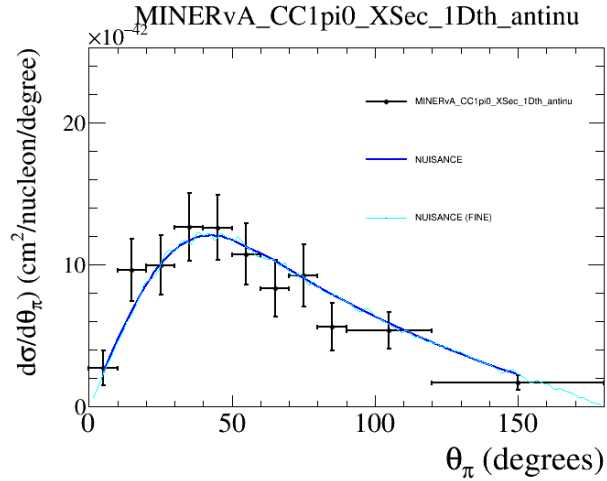


MINERvA\_CC1pip\_XSec\_1Denu\_nu\_2017\_settings

```

• name : MINERvA_CC1pip_XSec_1Denu_nu_2017
• input : GENIE:@GENIE_DIR/gntp.R-2_6_3.OfficialDefault.Default.MINERvA_fhc_nu_mu.CH.2500000.1.prepared
• type : DEFAULT
• default_types : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
• allowed_types : FIX/FULL
• enu_min : 1.5
• enu_max : 10
• description :
  |-> Target: CH
  |-> Flux: MINERvA Forward Horn Current nu_mu ONLY
  |-> Signal: Any event with 1 muon, and 1pi+ or 1pi- in FS. W < 1.4
• data : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pij
• covar : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CC1pi
• title : CC1π Updated
• xtitle : E_v (GeV)
• ytitle : σ(E_v) (cm²/nucleon)
• originalname : MINERvA_CC1pip_XSec_1Denu_nu_2017
• χ² : 5.33068
• NDOF : 8
• χ²/NDOF : 0.666336

```

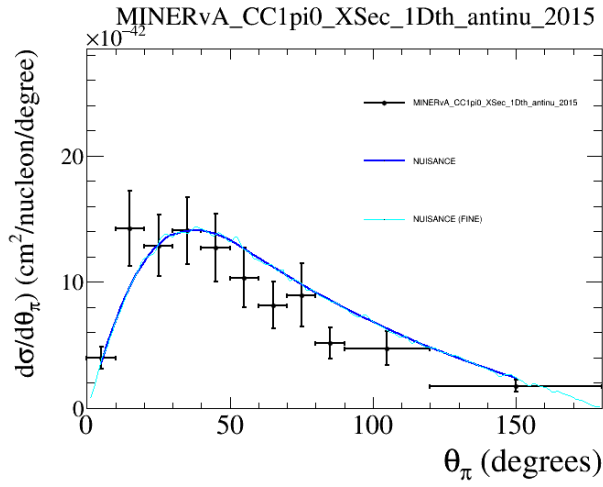


MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_settings

```

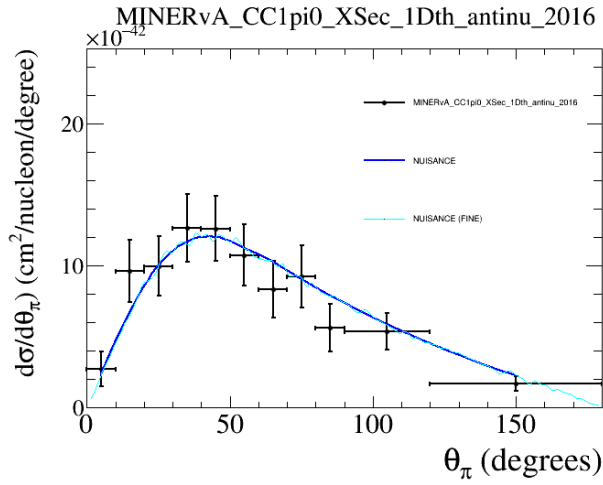
• name : MINERvA_CC1pi0_XSec_1Dth_antinu
• input : GENIE:@GENIE_DIR/gntp.R-2_6_3.OfficialDefault.Default.MINERvA_rhc_numubar.CH.2500000.2.prepared
• type : DEFAULT
• description :
  |-> MINERvA_CC1pi0_XSec_1Dth_antinu sample.
  |-> Target: CH
  |-> Flux: MINERvA Forward Horn Current numubar
  |-> Signal: Any event with 1 muon, 1 pion, no other tracks
• xtitle : θ_π (degrees)
• ytitle : dσ/dθ_π (cm²/nucleon/degree)
• default_types : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
• allowed_types : FIX/FULL
• enu_min : 1.5
• enu_max : 10
• title : MINERvA_CC1pi0_XSec_1Dth_antinu
• originalname : MINERvA_CC1pi0_XSec_1Dth_antinu
• χ² : 7.75216
• NDOF : 11
• χ²/NDOF : 0.704742

```



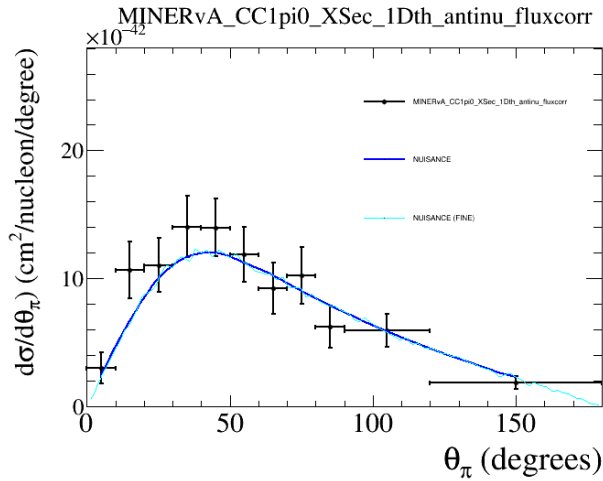
MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2015\_settings

- **name** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2015
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CC1pi0\_XSec\_1Dth\_antinu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current numubar  
 |-> Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $d\sigma/d\theta_\pi$  (cm<sup>2</sup>/nucleon/degree)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2015
- $\chi^2$  : 17.2829
- **NDOF** : 11
- $\chi^2/\text{NDOF}$  : 1.57117



MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2016\_settings

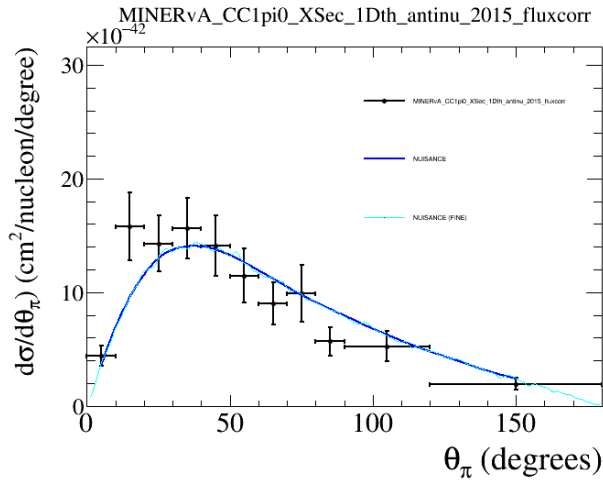
- **name** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2016
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CC1pi0\_XSec\_1Dth\_antinu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current numubar  
 |-> Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $d\sigma/d\theta_\pi$  (cm<sup>2</sup>/nucleon/degree)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2016
- $\chi^2$  : 7.75216
- **NDOF** : 11
- $\chi^2/\text{NDOF}$  : 0.704742



MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_fluxcorr\_settings

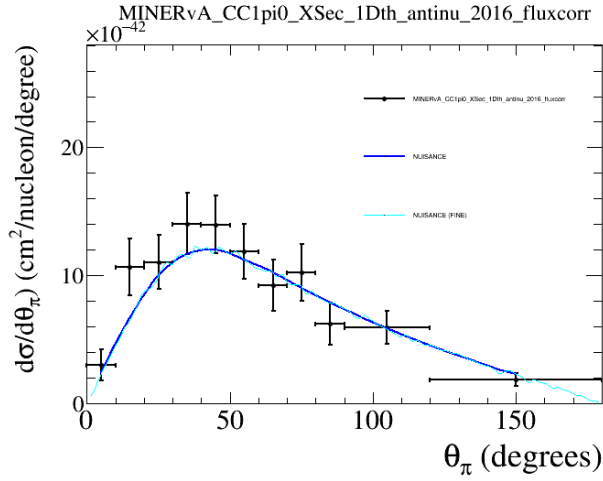
- **name** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CC1pi0\_XSec\_1Dth\_antinu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current numubar  
 |-> Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $d\sigma/d\theta_\pi$  (cm<sup>2</sup>/nucleon/degree)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_fluxcorr
- $\chi^2$  : 8.74057
- **NDOF** : 11
- $\chi^2/\text{NDOF}$  : 0.794597





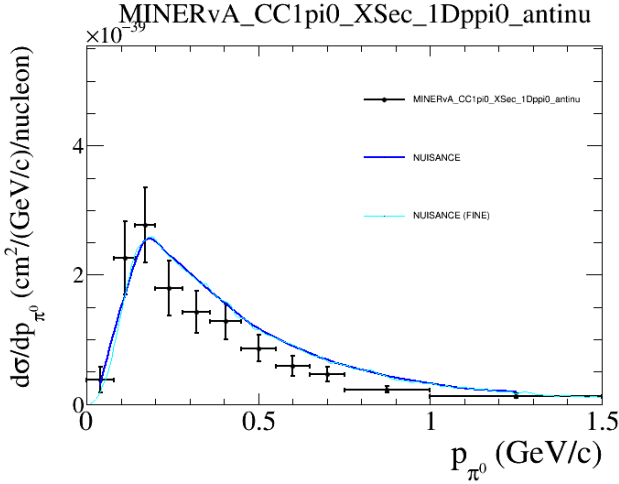
MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2015\_fluxcorr\_settings

- **name** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2015\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CC1pi0\_XSec\_1Dth\_antinu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current numubar  
 ↳ Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $d\sigma/d\theta_\pi$  (cm<sup>2</sup>/nucleon/degree)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2015\_fluxcorr
- $\chi^2$  : 14.3668
- **NDOF** : 11
- $\chi^2/\text{NDOF}$  : 1.30607



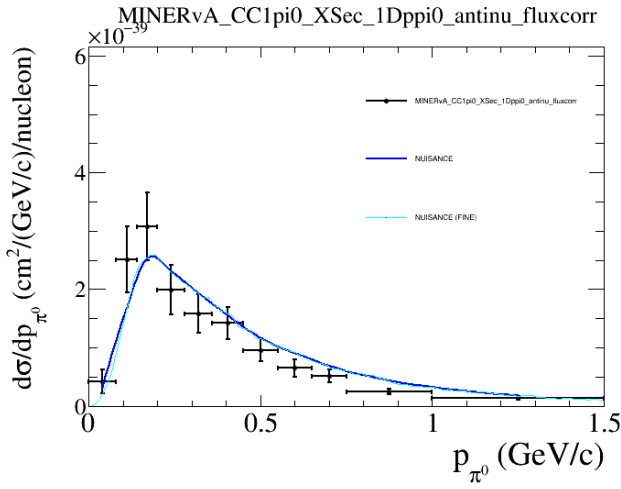
MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2016\_fluxcorr\_settings

- **name** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2016\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CC1pi0\_XSec\_1Dth\_antinu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current numubar  
 ↳ Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $\theta_\pi$  (degrees)
- **ytitle** :  $d\sigma/d\theta_\pi$  (cm<sup>2</sup>/nucleon/degree)
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1Dth\_antinu\_2016\_fluxcorr
- $\chi^2$  : 8.74057
- **NDOF** : 11
- $\chi^2/\text{NDOF}$  : 0.794597



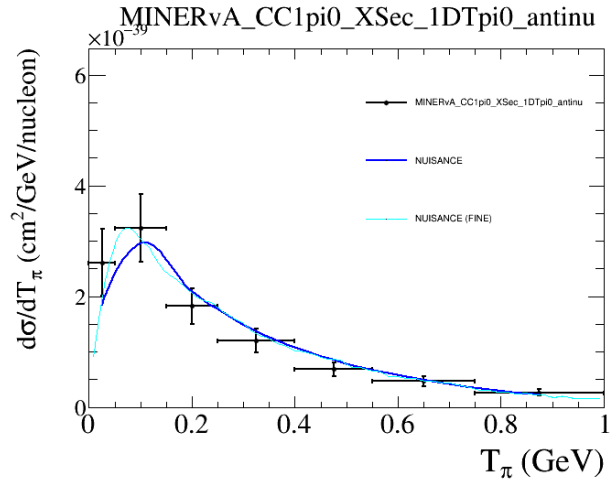
MINERvA\_CC1pi0\_XSec\_1Dppi0\_antinu\_settings

- **name** : MINERvA\_CC1pi0\_XSec\_1Dppi0\_antinu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CC1pi0\_XSec\_1Dppi0\_antinu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current numubar  
 ↳ Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $p_{\pi^0}$  (GeV/c)
- **ytitle** :  $d\sigma/dp_{\pi^0}$  (cm<sup>2</sup>/(GeV/c)/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG/NORM/MASK
- **allowed\_types** : FIX/DIAG
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1Dppi0\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1Dppi0\_antinu
- $\chi^2$  : 41.0959
- **NDOF** : 11
- $\chi^2/\text{NDOF}$  : 3.73599



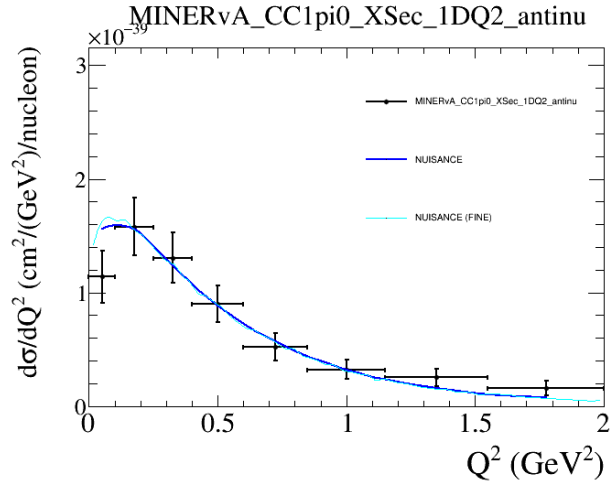
MINERvA\_CC1pi0\_XSec\_1Dppi0\_antinu\_fluxcorr\_settings

- **name** : MINERvA\_CC1pi0\_XSec\_1Dppi0\_antinu\_fluxcorr
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CC1pi0\_XSec\_1Dppi0\_antinu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current numubar  
 |-> Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $p_{\pi^0} \text{ (GeV/c)}$
- **ytitle** :  $d\sigma/dp_{\pi^0} \text{ (cm}^2\text{/(GeV/c)/nucleon)}$
- **default\_types** : FIX,FREE,SHAPE/DIAG/NORM/MASK
- **allowed\_types** : FIX/DIAG
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1Dppi0\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1Dppi0\_antinu\_fluxcorr
- $\chi^2$  : 29.9674
- **NDOF** : 11
- $\chi^2/\text{NDOF}$  : 2.72431



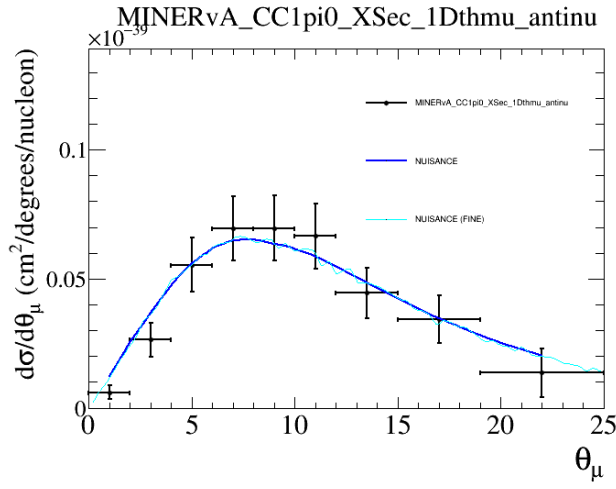
MINERvA\_CC1pi0\_XSec\_1DTpi0\_antinu\_settings

- **name** : MINERvA\_CC1pi0\_XSec\_1DTpi0\_antinu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CC1pi0\_XSec\_1DTpi0\_antinu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current numubar  
 |-> Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $T_{\pi} \text{ (GeV)}$
- **ytitle** :  $d\sigma/dT_{\pi} \text{ (cm}^2\text{/GeV/nucleon)}$
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1DTpi0\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1DTpi0\_antinu
- $\chi^2$  : 10.5678
- **NDOF** : 7
- $\chi^2/\text{NDOF}$  : 1.50969



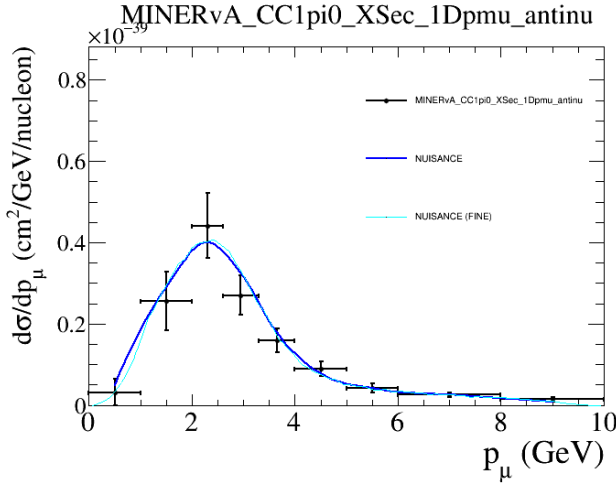
MINERvA\_CC1pi0\_XSec\_1DQ2\_antinu\_settings

- **name** : MINERvA\_CC1pi0\_XSec\_1DQ2\_antinu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CC1pi0\_XSec\_1DQ2\_antinu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current numubar  
 |-> Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $Q^2 \text{ (GeV}^2\text{)}$
- **ytitle** :  $d\sigma/dQ^2 \text{ (cm}^2\text{/(GeV}^2\text{)/nucleon)}$
- **default\_types** : FIX,FREE,SHAPE/DIAG/NORM/MASK
- **allowed\_types** : FIX/DIAG
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1DQ2\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1DQ2\_antinu
- $\chi^2$  : 10.4201
- **NDOF** : 8
- $\chi^2/\text{NDOF}$  : 1.30251



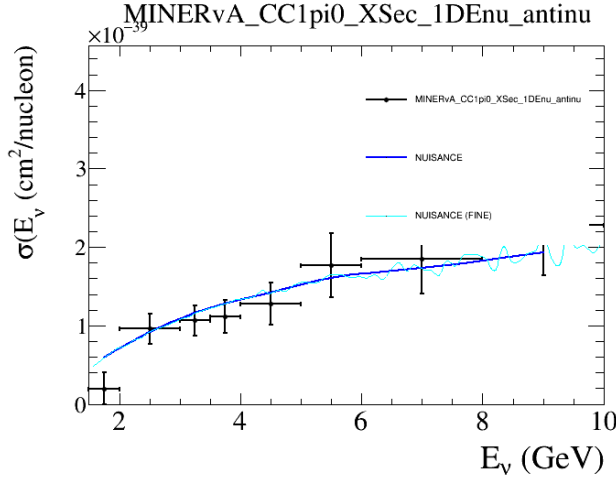
MINERvA\_CC1pi0\_XSec\_1Dthmu\_antinu\_settings

- **name** : MINERvA\_CC1pi0\_XSec\_1Dthmu\_antinu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CC1pi0\_XSec\_1Dthmu\_antinu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current numubar  
 |-> Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $\theta_\mu$
- **ytitle** :  $d\sigma/d\theta_\mu$  (cm<sup>2</sup>/degrees/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG/NORM/MASK
- **allowed\_types** : FIX/DIAG
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1Dthmu\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1Dthmu\_antinu
- $\chi^2$  : 10.5358
- **NDOF** : 9
- $\chi^2/\text{NDOF}$  : 1.17064



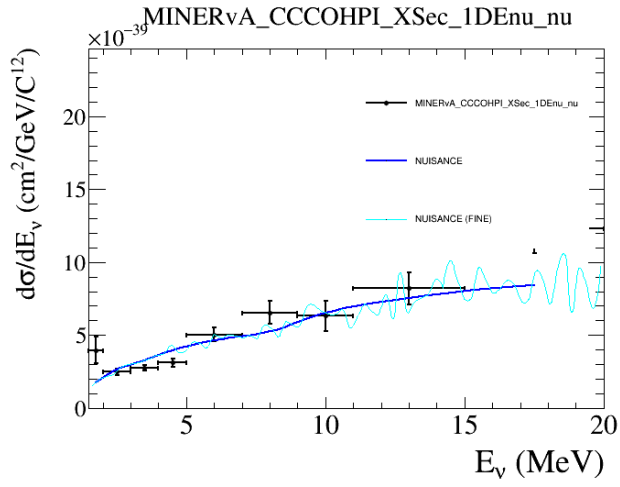
MINERvA\_CC1pi0\_XSec\_1Dpmu\_antinu\_settings

- **name** : MINERvA\_CC1pi0\_XSec\_1Dpmu\_antinu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CC1pi0\_XSec\_1Dpmu\_antinu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current numubar  
 |-> Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $p_\mu$  (GeV)
- **ytitle** :  $d\sigma/dp_\mu$  (cm<sup>2</sup>/GeV/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG/NORM/MASK
- **allowed\_types** : FIX/DIAG
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1Dpmu\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1Dpmu\_antinu
- $\chi^2$  : 7.07499
- **NDOF** : 9
- $\chi^2/\text{NDOF}$  : 0.78611



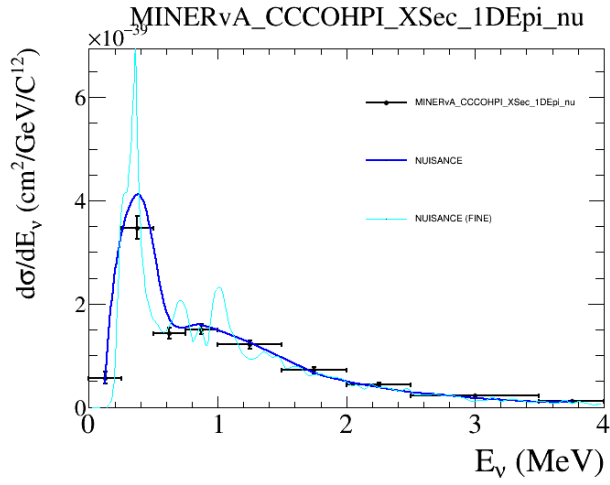
MINERvA\_CC1pi0\_XSec\_1DEnu\_antinu\_settings

- **name** : MINERvA\_CC1pi0\_XSec\_1DEnu\_antinu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |-> MINERvA\_CC1pi0\_XSec\_1DEnu\_antinu sample.  
 |-> Target: CH  
 |-> Flux: MINERvA Forward Horn Current numubar  
 |-> Signal: Any event with 1 muon, 1 pion, no other tracks
- **xtitle** :  $E_\nu$  (GeV)
- **ytitle** :  $\sigma(E_\nu)$  (cm<sup>2</sup>/nucleon)
- **default\_types** : FIX,FREE,SHAPE/DIAG/NORM/MASK
- **allowed\_types** : FIX/DIAG
- **enu\_min** : 1.5
- **enu\_max** : 10
- **title** : MINERvA\_CC1pi0\_XSec\_1DEnu\_antinu
- **originalname** : MINERvA\_CC1pi0\_XSec\_1DEnu\_antinu
- $\chi^2$  : 6.15226
- **NDOF** : 8
- $\chi^2/\text{NDOF}$  : 0.769033



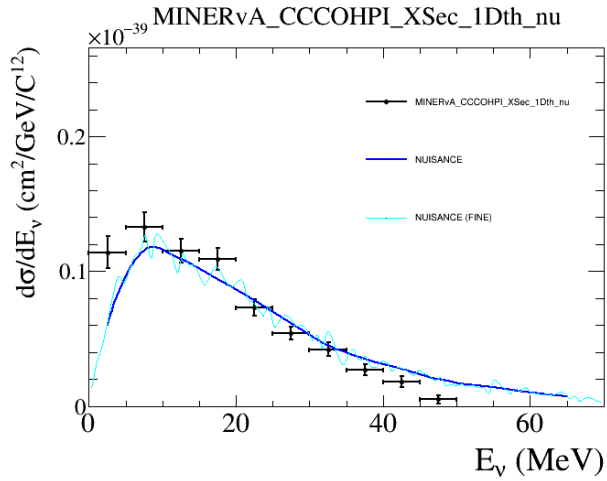
MINERvA\_CCCOHPI\_XSec\_1DEnu\_nu\_settings

- **name** : MINERvA\_CCCOHPI\_XSec\_1DEnu\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCCOHPI\_XSec\_1DEnu\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current numu  
 ↳ Signal: Any event with 1 mu-, 1 pi+, and no other FS particles
- **xtitle** :  $E_\nu$  (MeV)
- **ytitle** :  $d\sigma/dE_\nu$  ( $\text{cm}^2/\text{GeV}/\text{C}^{12}$ )
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 20
- **title** : MINERvA\_CCCOHPI\_XSec\_1DEnu\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCcoh
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCco
- **originalname** : MINERvA\_CCCOHPI\_XSec\_1DEnu\_nu
- $\chi^2$  : 0
- **NDOF** : 9
- $\chi^2/\text{NDOF}$  : 0



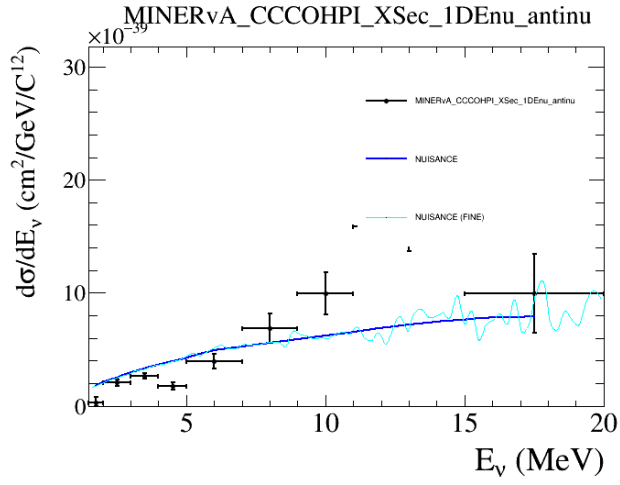
MINERvA\_CCCOHPI\_XSec\_1DEpi\_nu\_settings

- **name** : MINERvA\_CCCOHPI\_XSec\_1DEpi\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCCOHPI\_XSec\_1DEpi\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current numu  
 ↳ Signal: Any event with 1 mu-, 1 pi+, and no other FS particles
- **xtitle** :  $E_\nu$  (MeV)
- **ytitle** :  $d\sigma/dE_\nu$  ( $\text{cm}^2/\text{GeV}/\text{C}^{12}$ )
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 20
- **title** : MINERvA\_CCCOHPI\_XSec\_1DEpi\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCcoh
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCco
- **originalname** : MINERvA\_CCCOHPI\_XSec\_1DEpi\_nu
- $\chi^2$  : 0
- **NDOF** : 9
- $\chi^2/\text{NDOF}$  : 0



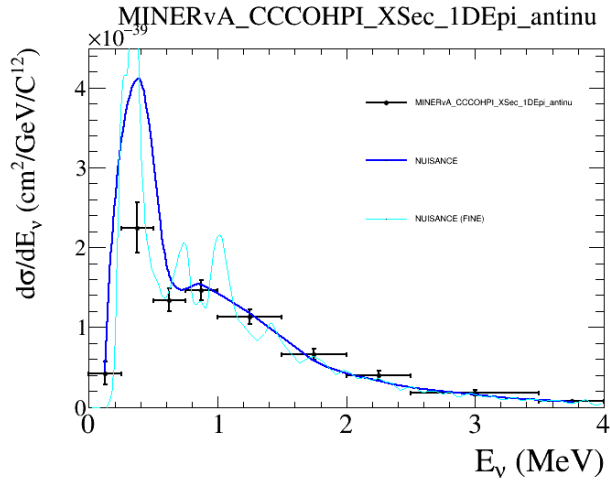
MINERvA\_CCCOHPI\_XSec\_1Dth\_nu\_settings

- **name** : MINERvA\_CCCOHPI\_XSec\_1Dth\_nu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_fhc\_numu.CH.2500000.1.prepared
- **type** : DEFAULT
- **description** :  
 ↳ MINERvA\_CCCOHPI\_XSec\_1Dth\_nu sample.  
 ↳ Target: CH  
 ↳ Flux: MINERvA Forward Horn Current numu  
 ↳ Signal: Any event with 1 mu-, 1 pi+, and no other FS particles
- **xtitle** :  $E_\nu$  (MeV)
- **ytitle** :  $d\sigma/dE_\nu$  ( $\text{cm}^2/\text{GeV}/\text{C}^{12}$ )
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 20
- **title** : MINERvA\_CCCOHPI\_XSec\_1Dth\_nu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCcoh
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCco
- **originalname** : MINERvA\_CCCOHPI\_XSec\_1Dth\_nu
- $\chi^2$  : 0
- **NDOF** : 12
- $\chi^2/\text{NDOF}$  : 0



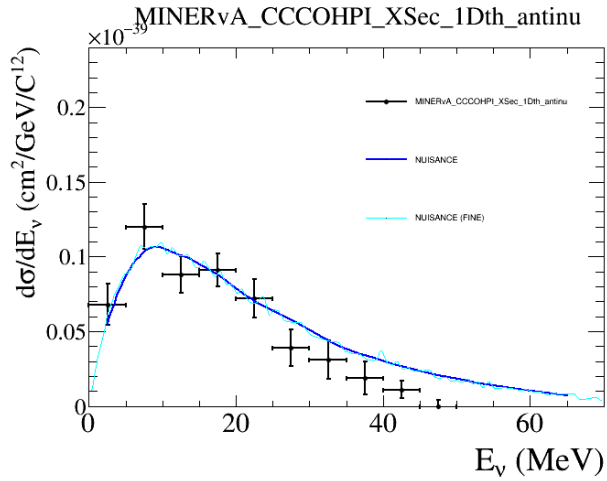
MINERvA\_CCOHPI\_XSec\_1DEnu\_antinu\_settings

- **name** : MINERvA\_CCOHPI\_XSec\_1DEnu\_antinu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |--> MINERvA\_CCOHPI\_XSec\_1DEnu\_antinu sample.  
 |--> Target: CH  
 |--> Flux: MINERvA Reverse Horn Current numu  
 |--> Signal: Any event with 1 mu+, 1 pi-, and no other FS particles
- **xtitle** :  $E_\nu$  (MeV)
- **ytitle** :  $d\sigma/dE_\nu$  ( $\text{cm}^2/\text{GeV}/\text{C}^{12}$ )
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 20
- **title** : MINERvA\_CCOHPI\_XSec\_1DEnu\_antinu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCcoh
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCco
- **originalname** : MINERvA\_CCOHPI\_XSec\_1DEnu\_antinu
- $\chi^2$  : 0
- **NDOF** : 9
- $\chi^2/\text{NDOF}$  : 0



MINERvA\_CCOHPI\_XSec\_1DEpi\_antinu\_settings

- **name** : MINERvA\_CCOHPI\_XSec\_1DEpi\_antinu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |--> MINERvA\_CCOHPI\_XSec\_1DEpi\_antinu sample.  
 |--> Target: CH  
 |--> Flux: MINERvA Reverse Horn Current numu  
 |--> Signal: Any event with 1 mu+, 1 pi-, and no other FS particles
- **xtitle** :  $E_\nu$  (MeV)
- **ytitle** :  $d\sigma/dE_\nu$  ( $\text{cm}^2/\text{GeV}/\text{C}^{12}$ )
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 20
- **title** : MINERvA\_CCOHPI\_XSec\_1DEpi\_antinu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCcoh
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCco
- **originalname** : MINERvA\_CCOHPI\_XSec\_1DEpi\_antinu
- $\chi^2$  : 0
- **NDOF** : 9
- $\chi^2/\text{NDOF}$  : 0



MINERvA\_CCOHPI\_XSec\_1Dth\_antinu\_settings

- **name** : MINERvA\_CCOHPI\_XSec\_1Dth\_antinu
- **input** : GENIE:@GENIE\_DIR/gntp.R-2\_6\_3.OfficialDefault.Default.MINERvA\_rhc\_numubar.CH.2500000.2.prepa
- **type** : DEFAULT
- **description** :  
 |--> MINERvA\_CCOHPI\_XSec\_1Dth\_antinu sample.  
 |--> Target: CH  
 |--> Flux: MINERvA Reverse Horn Current numu  
 |--> Signal: Any event with 1 mu+, 1 pi-, and no other FS particles
- **xtitle** :  $E_\nu$  (MeV)
- **ytitle** :  $d\sigma/dE_\nu$  ( $\text{cm}^2/\text{GeV}/\text{C}^{12}$ )
- **default\_types** : FIX,FREE,SHAPE/DIAG,FULL/NORM/MASK
- **allowed\_types** : FIX/FULL
- **enu\_min** : 1.5
- **enu\_max** : 20
- **title** : MINERvA\_CCOHPI\_XSec\_1Dth\_antinu
- **data** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCcoh
- **covar** : /data/stowell/NIWG/NPCTuning/Validations/minerva-validation-template/builds/v2r6/data/MINERvA/CCco
- **originalname** : MINERvA\_CCOHPI\_XSec\_1Dth\_antinu
- $\chi^2$  : 0
- **NDOF** : 12
- $\chi^2/\text{NDOF}$  : 0

