# ncgamma analysis tools

Corina Nantais
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# 13av2 < 11bv3.2

- calculating the flux averaged theoretical cross section requires the tuned flux
- decrease in updated flux decreases flux averaged theoretical cross section

python NominalXsec.py

```
Emax:  1.85
Emin:  0.47
Info in <TCanvas::MakeDefCanvas>:  created default TCanvas with name c1
Info in <TCanvas::Print>: gif file fluxmean.gif has been created


Flux Mean:   0.820
Flux +/-68%:-0.223 +0.441
Flux +/-68%:0.596 to 1.261

Replacing with
Flux Median: 0.630
Flux +/-68%:-0.230 +0.310
Flux +/-68%:0.400 to 0.940


Flux-averaged xsec for ankowski is 2.00515
Flux-averaged xsec for ma1.01 is 1.55375
Flux-averaged xsec for ma1.21 is 1.90529
Flux-averaged xsec for ma1.41 is 2.21734
Flux-averaged xsec for neut is 2.2686
```

| | |
|---|---|
| 13av2 screenshot = | 2.00515 |
| 11bv3.2 screenshot = | 2.01667 |
| TN-244 text = | 2.01 |

13av2 < 11bv3.2
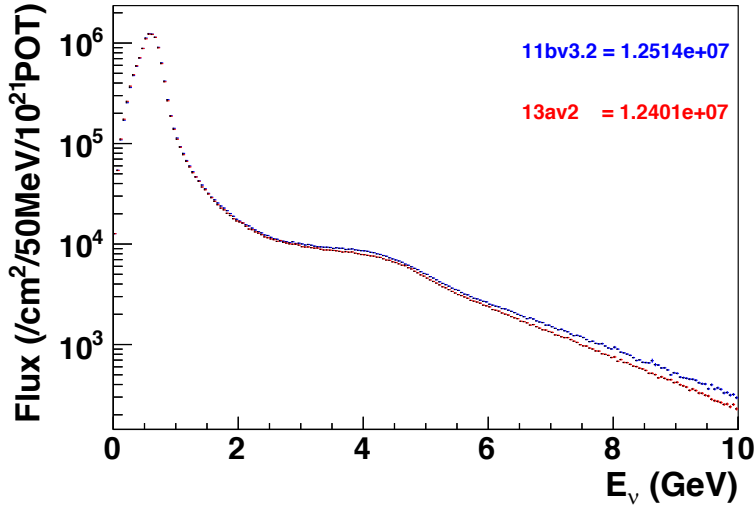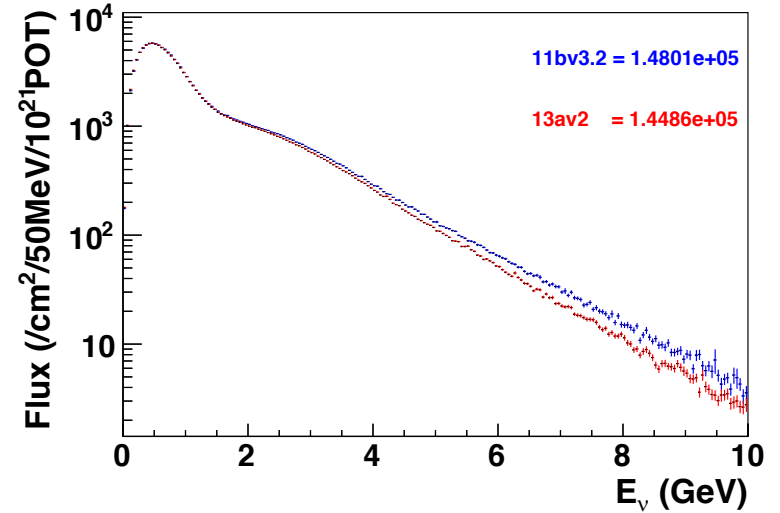
11bv3.2: 50 MeV bins from 0 – 10 GeV → 200 bins
13av2:    50 MeV bins from 0 – 10 GeV, then 1 GeV bins 10 – 30 GeV → 220 bins

**print** integral 0–10 GeV (bins 1–200)

numu

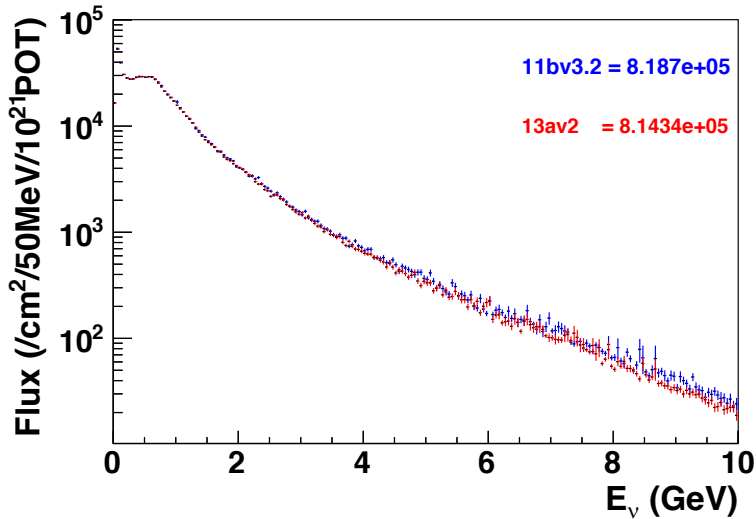Flux (/cm²/50MeV/10²¹POT)
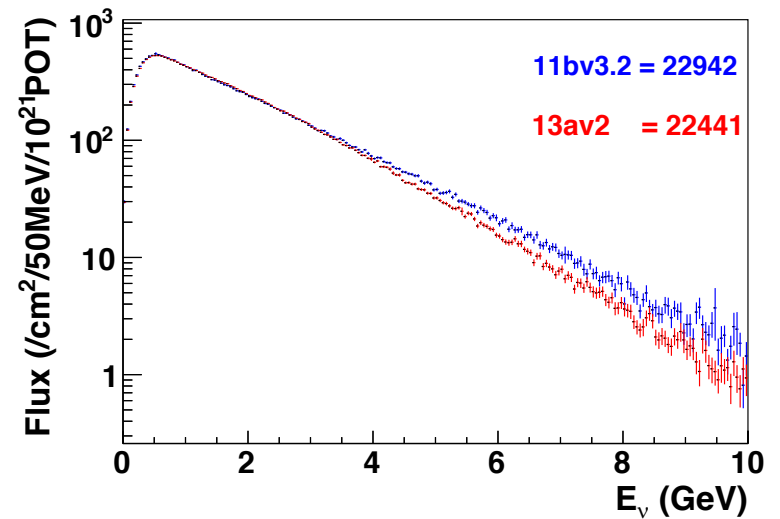
11bv3.2 = 1.2514e+07

13av2   = 1.2401e+07

E_ν (GeV)

nue

Flux (/cm²/50MeV/10²¹POT)

11bv3.2 = 1.4801e+05

13av2   = 1.4486e+05

E_ν (GeV)

numub

Flux (/cm²/50MeV/10²¹POT)

11bv3.2 = 8.187e+05

13av2   = 8.1434e+05

E_ν (GeV)

nueb

Flux (/cm²/50MeV/10²¹POT)

11bv3.2 = 22942

13av2   = 22441

E_ν (GeV)

sk_tuned11bv3.2_11anom_run1-run4_fine.root
sk_tuned13av2_13anom_run1-8_numode_fine.root

# tuned release > nominal release

- generating NEUT MC requires the untuned flux
- not sure if I should use nominal release or tuned release
- expect them to be identical
- plot to compare them

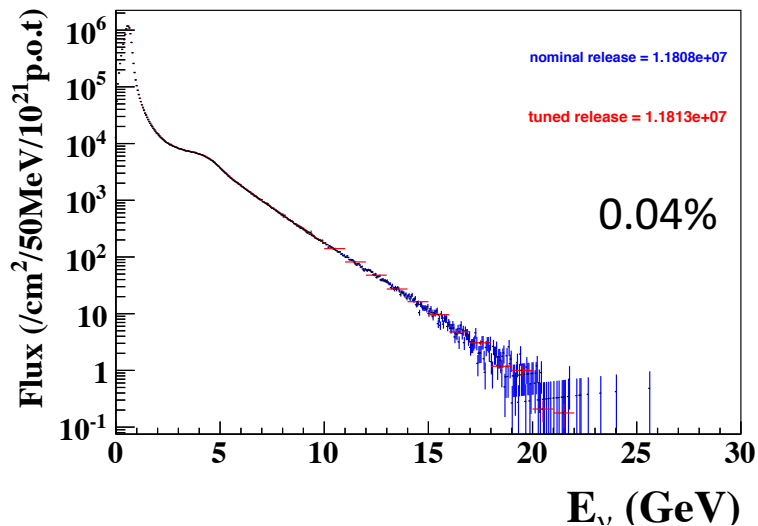tuned release > nominal release (< 1%)
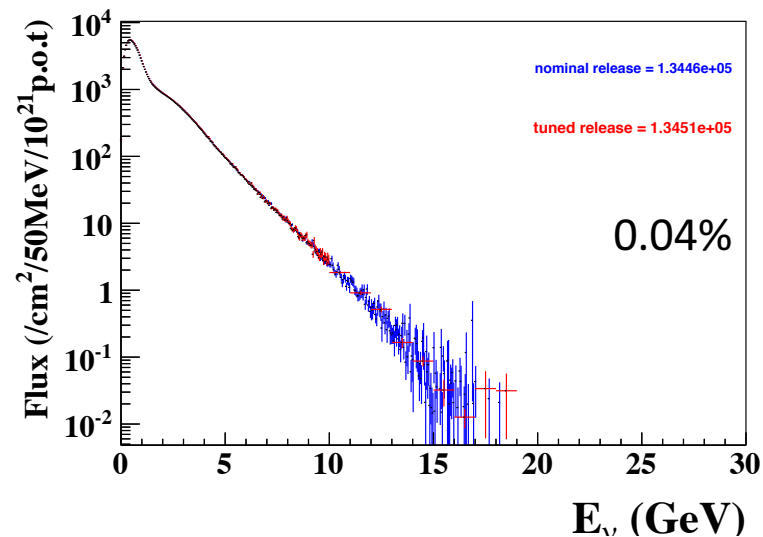
nominal: 50 MeV bins from 0 – 30 GeV → 600 bins
tuned:    50 MeV bins from 0 – 10 GeV, then 1 GeV bins 10 – 30 GeV → 220 bins

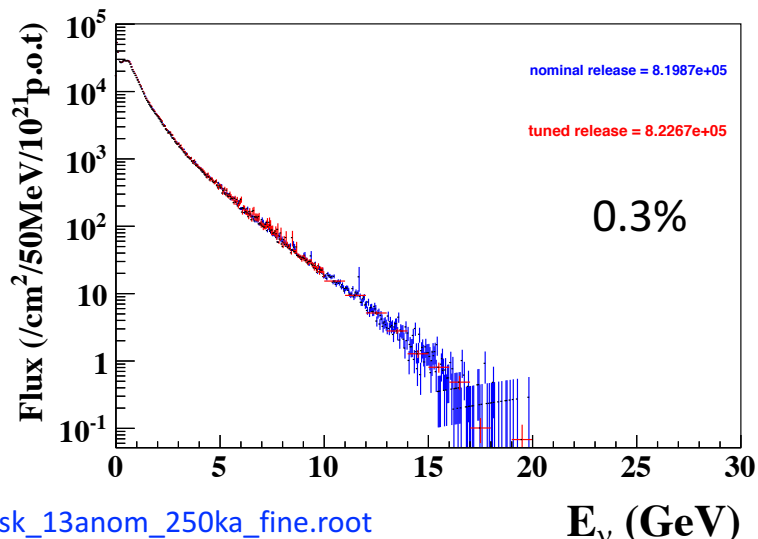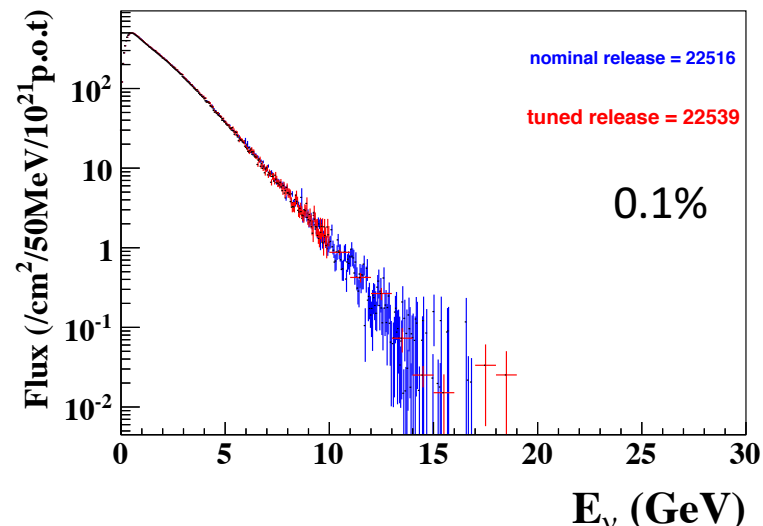→ ask Tom

**print** integral 0–10 GeV (bins 1–200)

numu

nue



nominal release = 1.1808e+07

tuned release = 1.1813e+07

0.04%

nominal release = 1.3446e+05

tuned release = 1.3451e+05

0.04%

numub

nueb

nominal release = 8.1987e+05

tuned release = 8.2267e+05

0.3%

nominal release = 22516

tuned release = 22539

0.1%

sk_13anom_250ka_fine.root
sk_tuned13av2_13anom_run1-8_numode_fine.root