INGRID
of expectation with
I I a tuned-v2

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- Just update of expected # of events in INGRID with last tuned flux (11a tuned-v2).
- Default MC to calculate # of expectation
  - Jnubeam 10d nominal (Run I)
  - NEUT 5.0.6
  - Detector MC (Kyoto)
  - Consider numu & numubar.

Caution : this tuning is NOT official. (official tuning flux released from beamMC group as soon as possible)

Flux info

- Summary info of flux release is put on : http://www.t2k.org/beam/NuFlux/FluxRelease/JNUBEAMSummary/summary_flux_release.pdf/view
- Report of flux tuning is put on : http://www.t2k.org/asg/meeting/20110901/11av2_tunedflux_20110901_v2.pdf/view

10d nominal

- Horn current (Average of RUN1)
  - Horn1: 250.71 kA, Horn2: 248.96 kA, Horn3: 248.09kA
- Proton beam conditions: Based on measurement during RUN1
  - Please see the technical note (TN-054)
- Hadron production model in the target
  - FLUKA2008

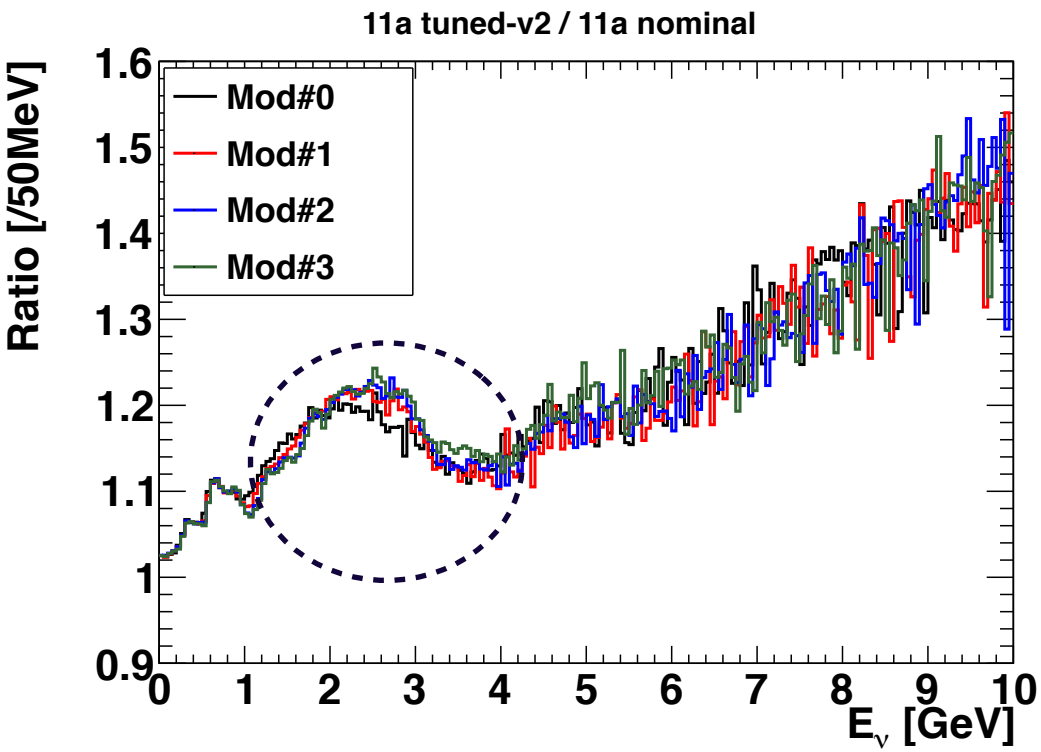
11a nominal

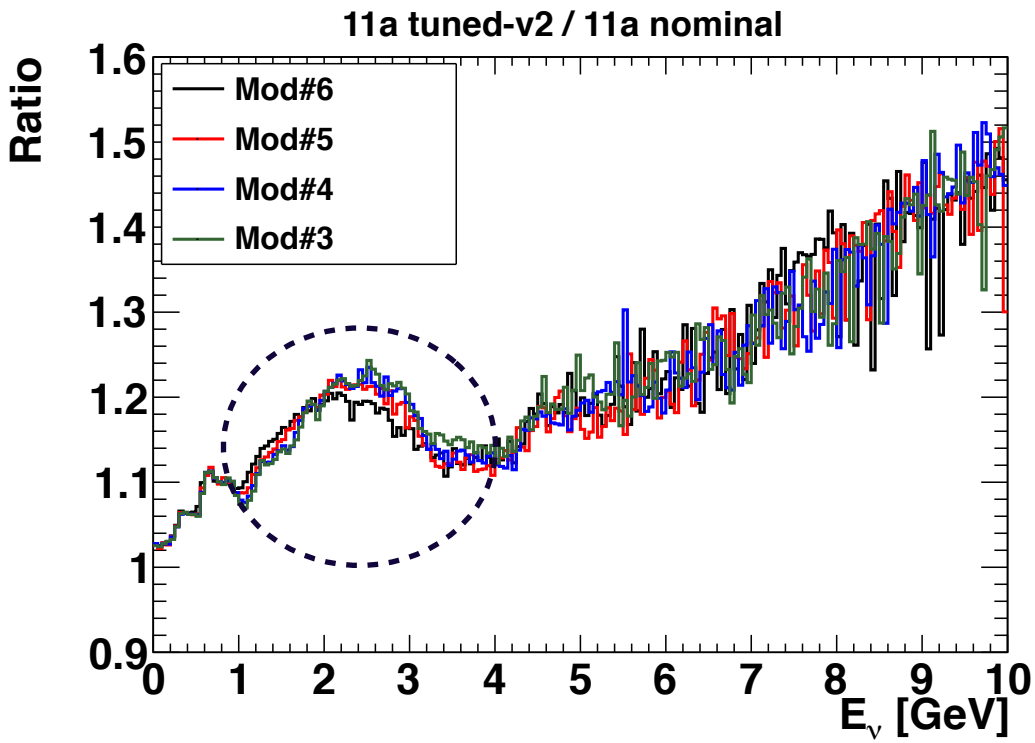
- Horn current: 249.67 kA for all horns
- Proton beam conditions:
  - Gaussian beam w/ 0.4243 cm
  - On center @ baffle & parallel beam w/ beam axis
- Hadron production model in the target
  - FLUKA2008
- "11a nominal" means 11a flux w/ these beam setting
  - (Ratio to this flux is provided)

→ Proton beam & horn current is different between 10d nominal & 11a nominal.

Flux ratio (numu) : 11a-v2/11a-nominal

Bin width=50MeV



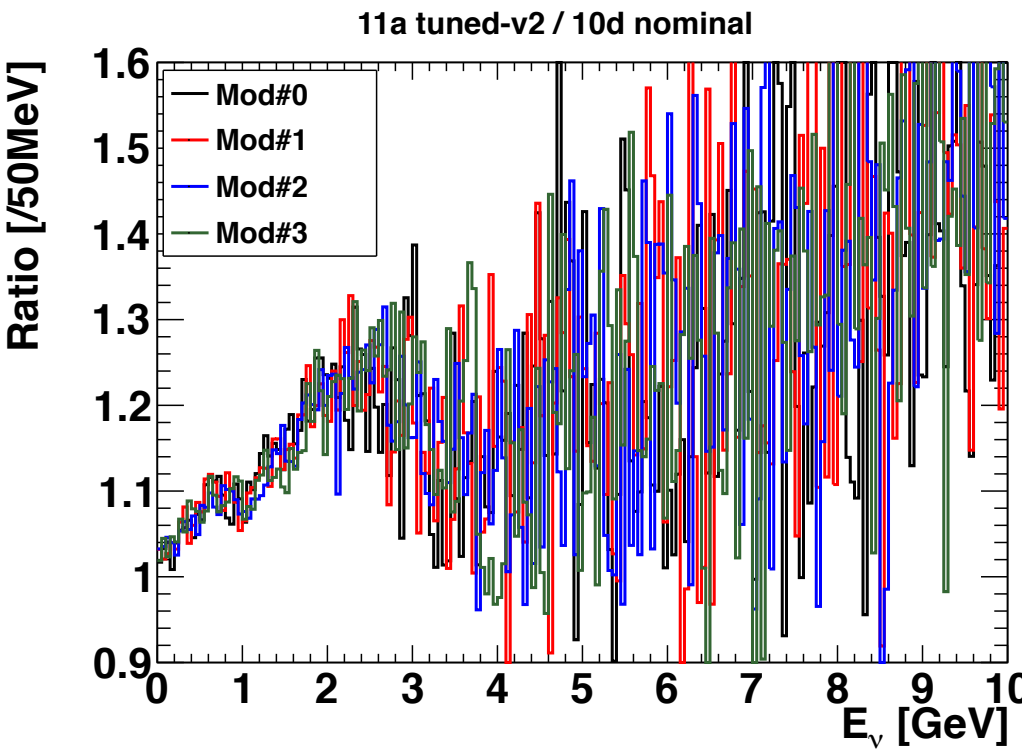


Difference (<2%) between module#0,#6(edge module) and other modules around 1~3GeV

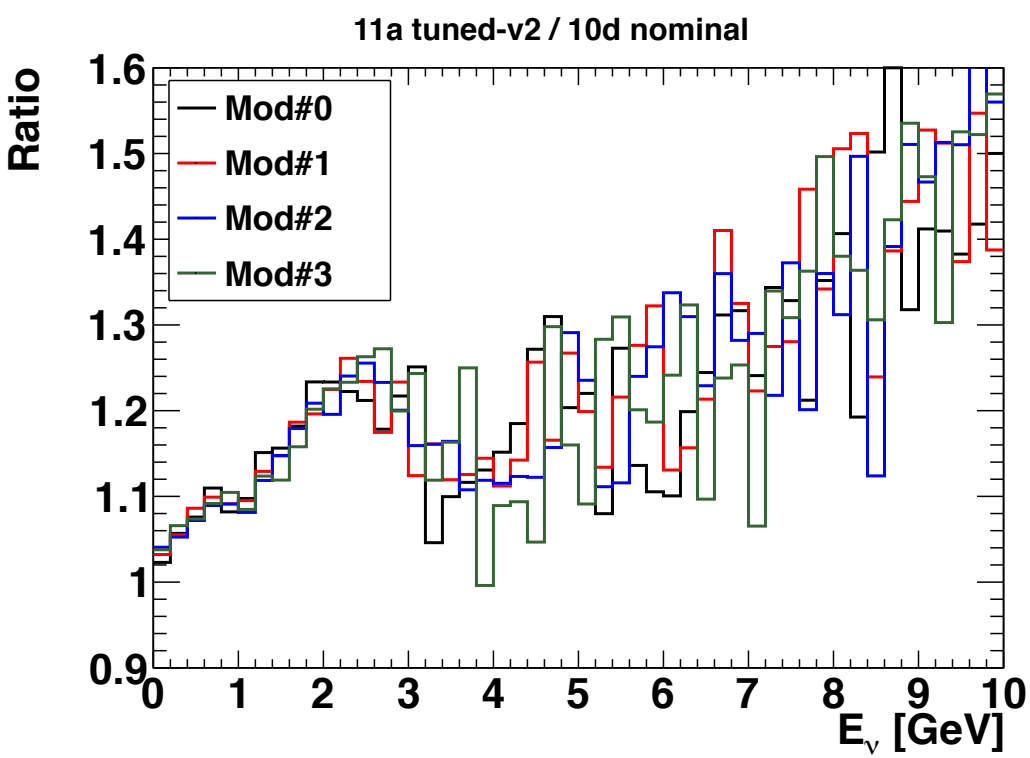
→ I will report beamMC meeting and discuss .

Flux ratio (numu) : 11a-v2/10d-nominal

Bin width=50MeV



Bin width=200MeV



Need more MC stat of 10d nominal.

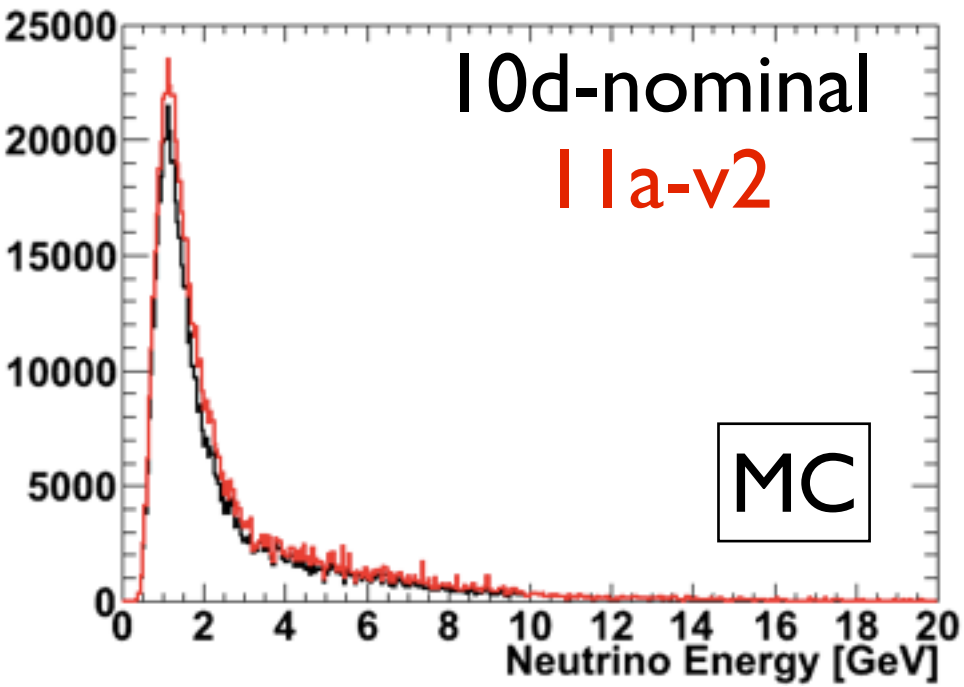
Anyway, I use the ratio with **200MeV binning** to calculate expectation.

Flux at more than 10GeV region is not tuned in this calculation.

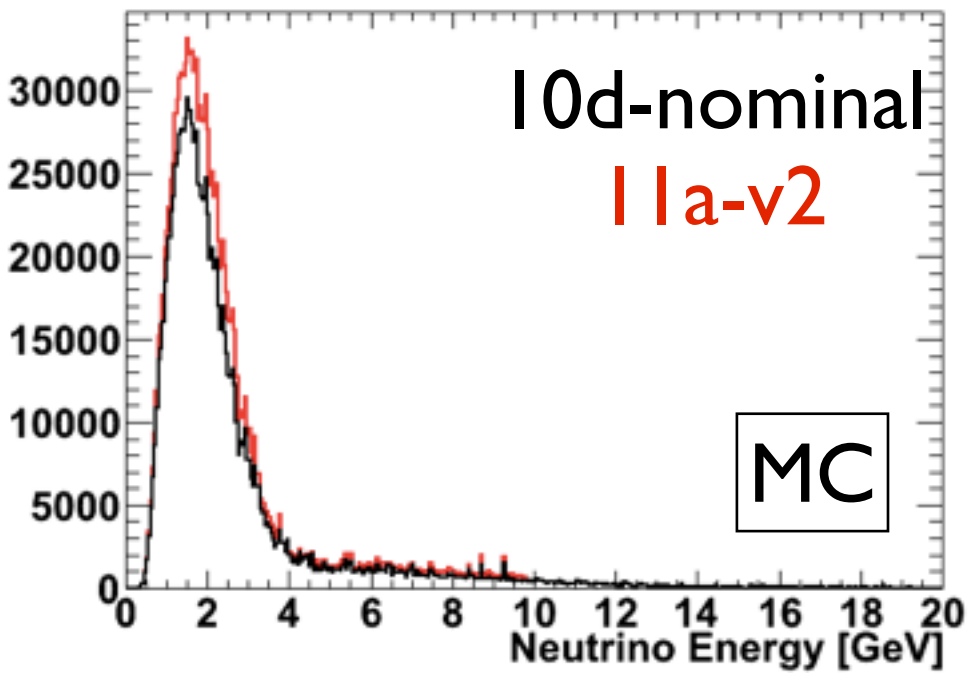
Neutrino energy spectrum

After neutrino event selection

numu @mod0



numu @mod3



Expected # of events

Expected # of events at 14 standard modules
(numu + anti-numu)

	Expected # of events [/10^{21}POT]	Ratio to 10d-v2
10d-v2 (Run I)	**1.454E+07**	**1.000**
10d-v3.1 (Run I&II)	**1.491E+07**	**1.025**
11a-v2	**1.532E+07**	**1.054**

Need proton beam tuning for 11a-v2

Expected # of events (Enu<4GeV, Enu>4GeV) for numu

of expectation of each energy region

	Nexp(<4GeV)	Fraction to all	Nexp(>4GeV)	Fraction to all
10dv2(RunI)	1.237E+07	0.867	1.895E+06	0.133
10dv3.1(RunI&II)	1.275E+07	0.871	1.895E+06	0.129
11av2	1.278E+07	0.850	2.263E+06	0.150

Ratio to 10d-v2 of each energy region

	Nexp(<4GeV)	Nexp(>4GeV)
10dv2(RunI)	1.000	1.000E+00
10dv3.1(RunI&II)	1.030	1.000E+00
11av2	1.033	1.194E+00

DATA/MC

Event rate of DATA

	Event rate [/10^{14}POT]
Run I only	**1.562**
Run II only	**1.581**
Run I & II	**1.577**

DATA/MC

	DATA/MC
DATA(RunI)/10d-v2(RunI)	**1.073**
DATA(RunI&II)/10d-v3(RunI&II)	**1.058**
DATA(RunI&II)/11a-v2	**1.029**

→ Need real beam tuning to 11a-v2 (a few % effect)