Status Report

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Outline

- Reproducing Maxim's table/plot
- Likelihood efficiency
- Number of high energy event in ATM MC vs T2K MC
- Smearing function

Reproducing Maxim table:

	νμ CC mis-ID	NC	Beam νe	Signal (chooz)
FC,FV,Evis>100 (MeV)	2081.7	801.37	182.9	217.9
Single ring	983 (47.2%)	214.7 (26.8%)	89 (48.7%)	1843 (84.6%)
E-like	39.0 (1.9%)	168.3 (21.0%)	86.7 (47.4%)	182.2 (83.6%)
No decay e-	13.6 (0.65%)	149.9 (18.7%)	72.4 (39.6%)	166.4 (76.2%)
0.35<Eν<0.85 (Gev)	1.37(0.07%)	50.8 (6.3%)	20.7 (11.3%)	127.2 (58.3%)
$Cos\theta_{vlepton}$<0.9	1.025 (0.05%)	35.8 (4.5%)	17.5 (9.6%)	111.4 (51.1%)
Polfit Mγγ < 100 MeV/c²	0.47 (0.02%)	11.8 (1.5%)	13.9 (7.6%)	94.1 (43.2%)
ΔlogLikelihood < 80	0.35(0.017%)	9.8 (1.2%)	13.5 (7.4%)	91.9 (42.2%)

My results

Problem 1

Problem 2

FCFV	2819.9		1114.6		182.2		219.3	
single ring	1324	46.95%	301.6	27.10%	95.2	52.20%	187.3	85.40%
e-like	53	1.88%	237.7	21.30%	94.5	51.80%	186	84.80%
no decay_e	22.8	0.81%	213.1	19.10%	80.4	44.10%	170.7	77.80%
0.35<E<0.85	2.1	0.07%	72.1	6.50%	22	12.10%	133.6	60.90%
Likelihood	0.6	0.023%	14.8	1.30%	17.9	9.90%	108.6	49.50%

Problems explanation

Problem 1: Possible explanation

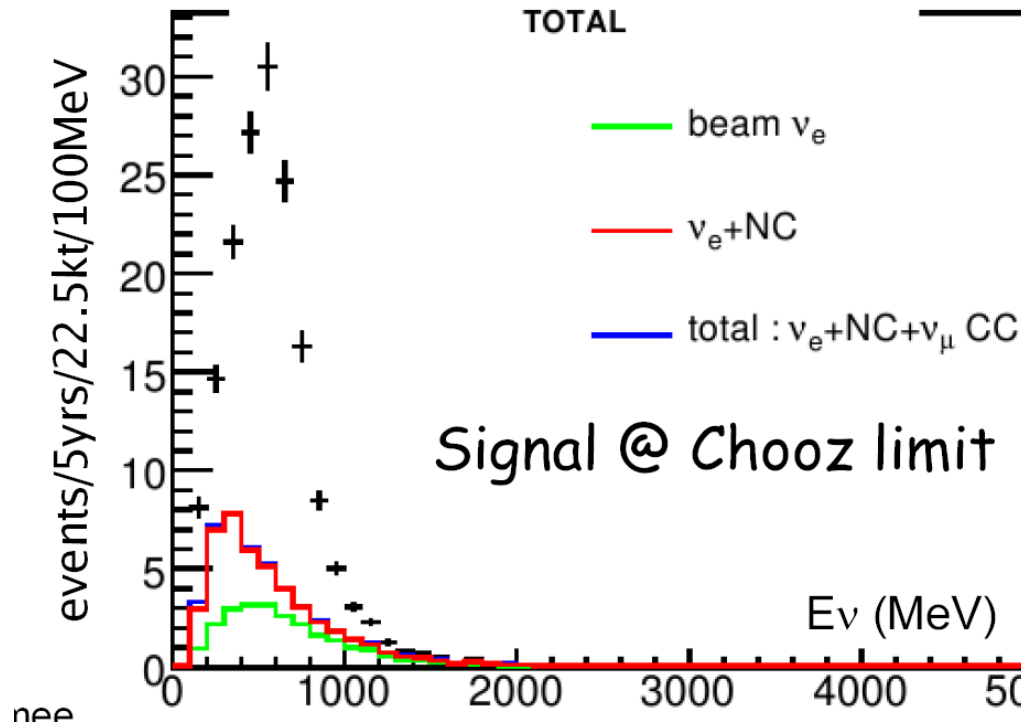
- I am still not running on the entire T2K ν_μ sample
- Bug in normalization function

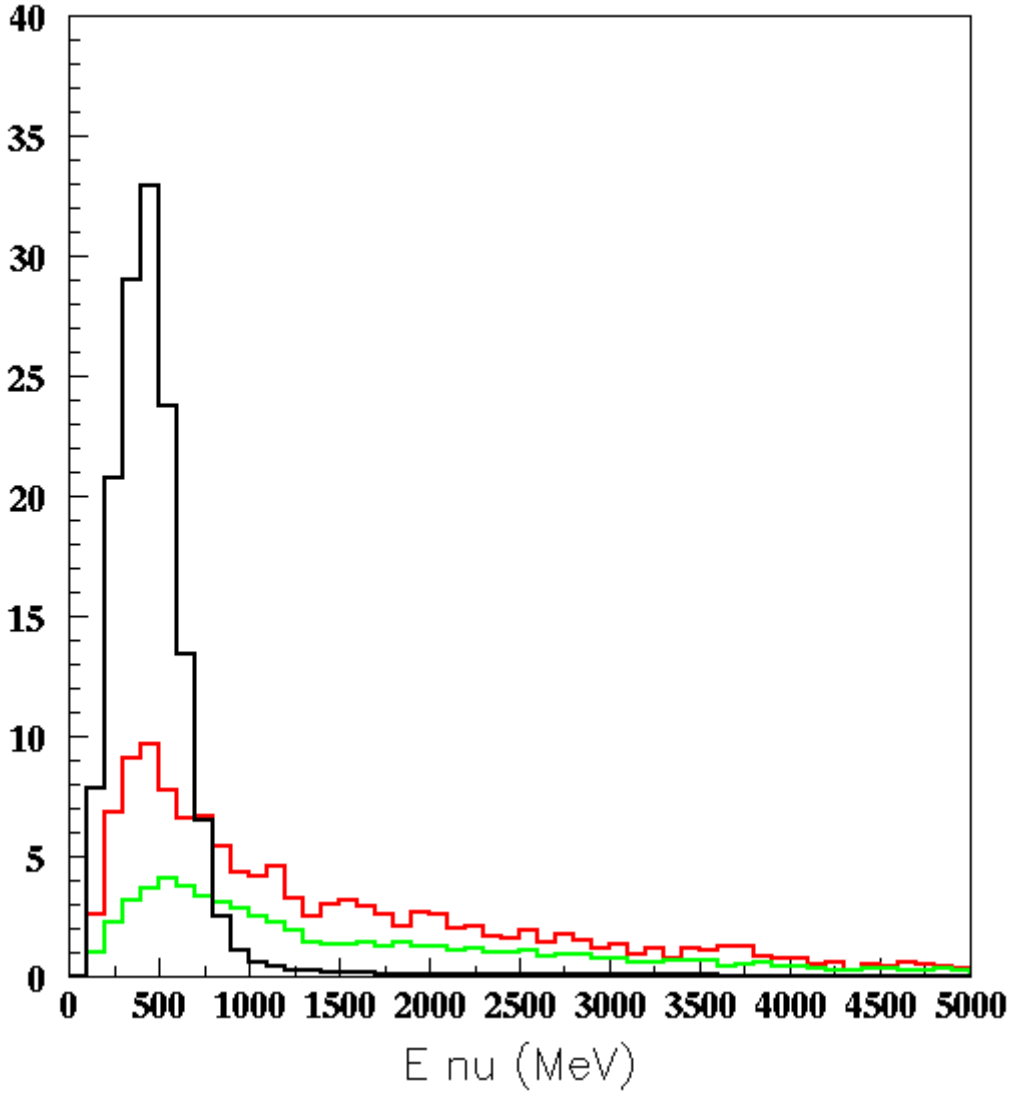
Problem 2: This is not the final version of Maxim's table

He still had the NC in his ν_e sample

Maxim's plot:

I fixed my bug, I can now simulate ν_e events from beam ν_e





Compare Likelihood efficiency

	running on ATM MC			running on T2K		
Erec(GeV)	Signal	Bckg($\nu\mu$ CC)	Bckg(NC)	Signal	Bckg($\nu\mu$ CC)	Bckg(NC)
0~0.35	90.3%	16.4%	9.8%	84.6%	14.6%	10.1%
0.35~0.85	83.2%	31.6%	21.2%	81.4%	31.4%	20.5%
0.85~1.5	79.4%	12.0%	23.1%	80.1%	32.0%	19.4%
1.5~	76.0%	14.3%	34.5%	73.9%	18.7%	34.0%

Erec(GeV)	Signal	Bckg($\nu\mu$ CC)	Bckg(NC)
Maxim			
0.35~0.85	65.2%	25.0%	19.0%
My			
0.35~0.85	81.4%	31.4%	20.5%

Look good !
I fixed polfit problem

My code keep many more signal, but is not as good to rejected ν_μ

Number of high energy events

Atm MC (E_{rec}>1.5GeV) **11803**

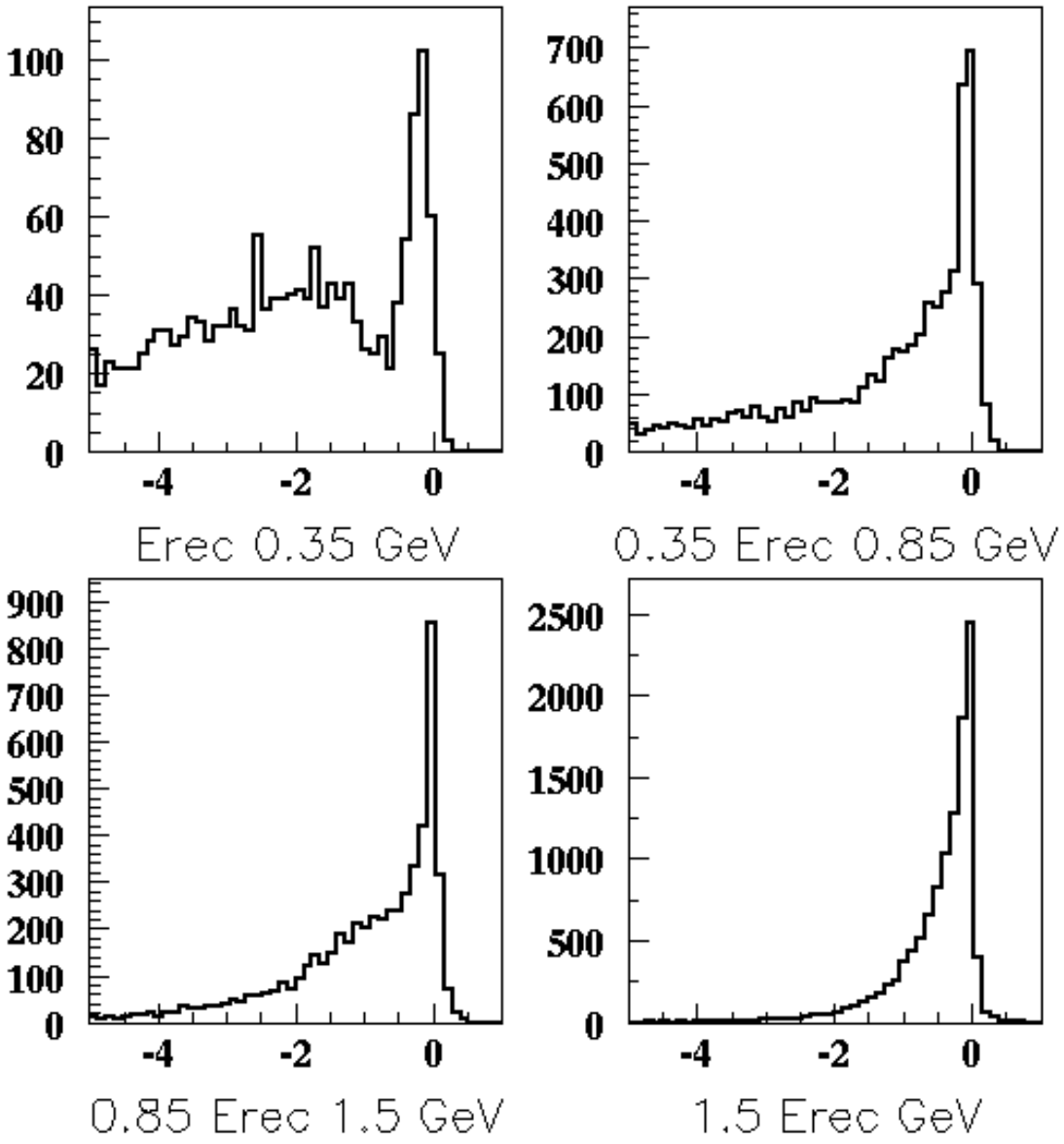
T2K total (Estimate) **7981**

Details:

T2K ν_e sample	5606
T2K ν_μ sample	
(only 800 files)	613
(all sample 3100 files)	2376 (estimate)

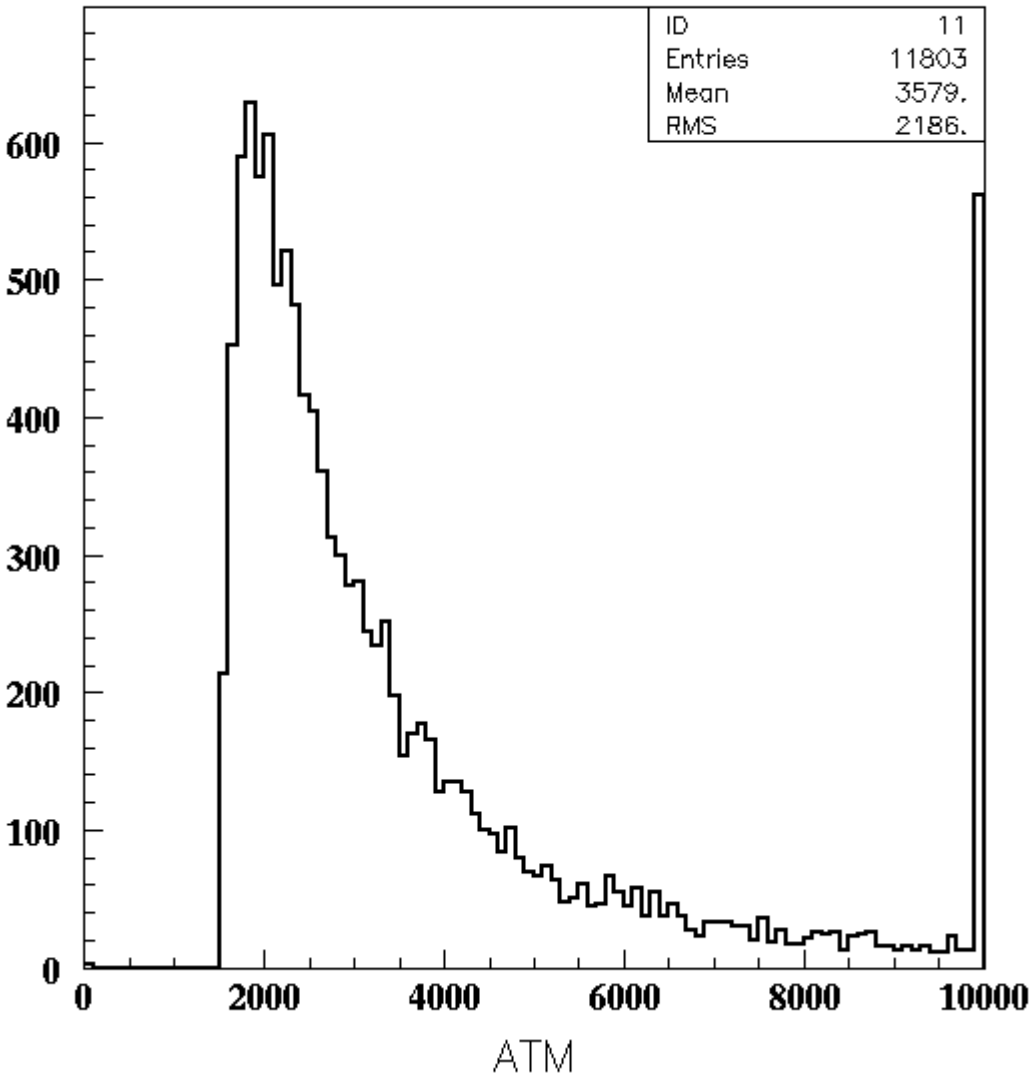
Smearing function

(E_rec-E_true)/E_rec

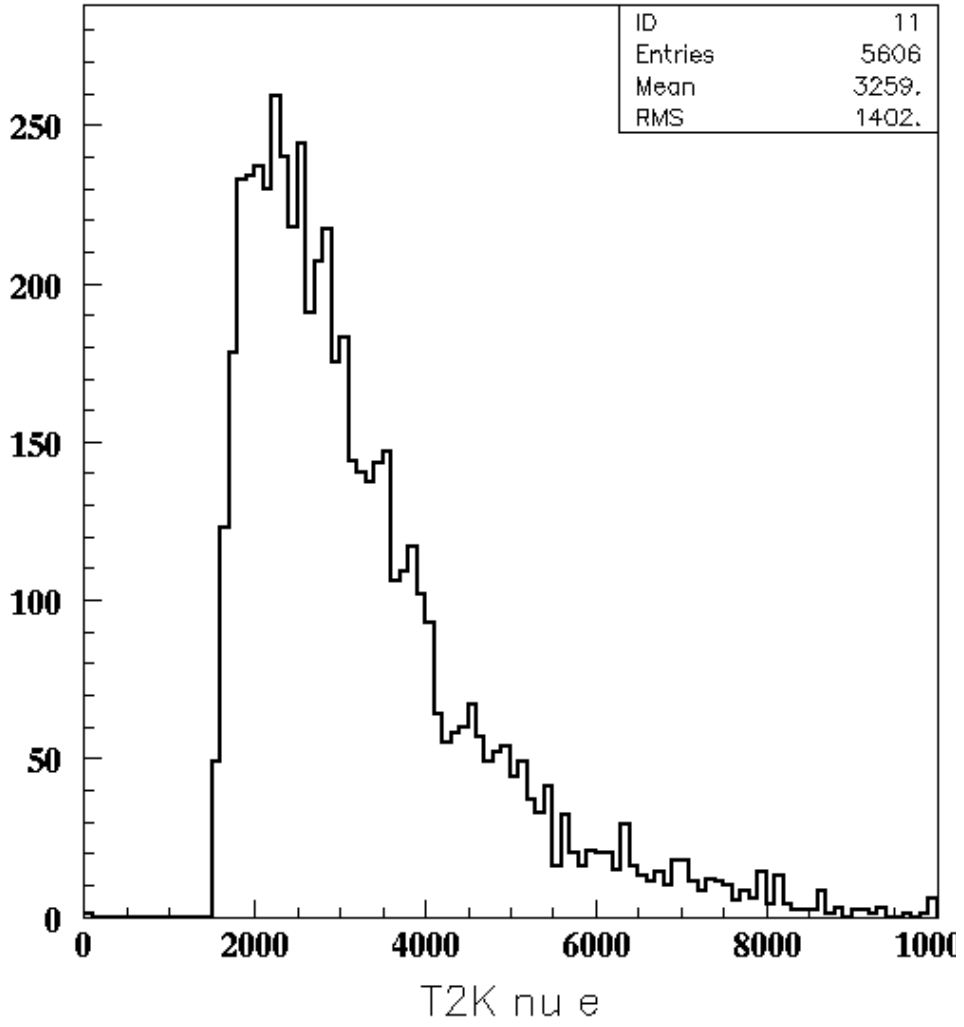


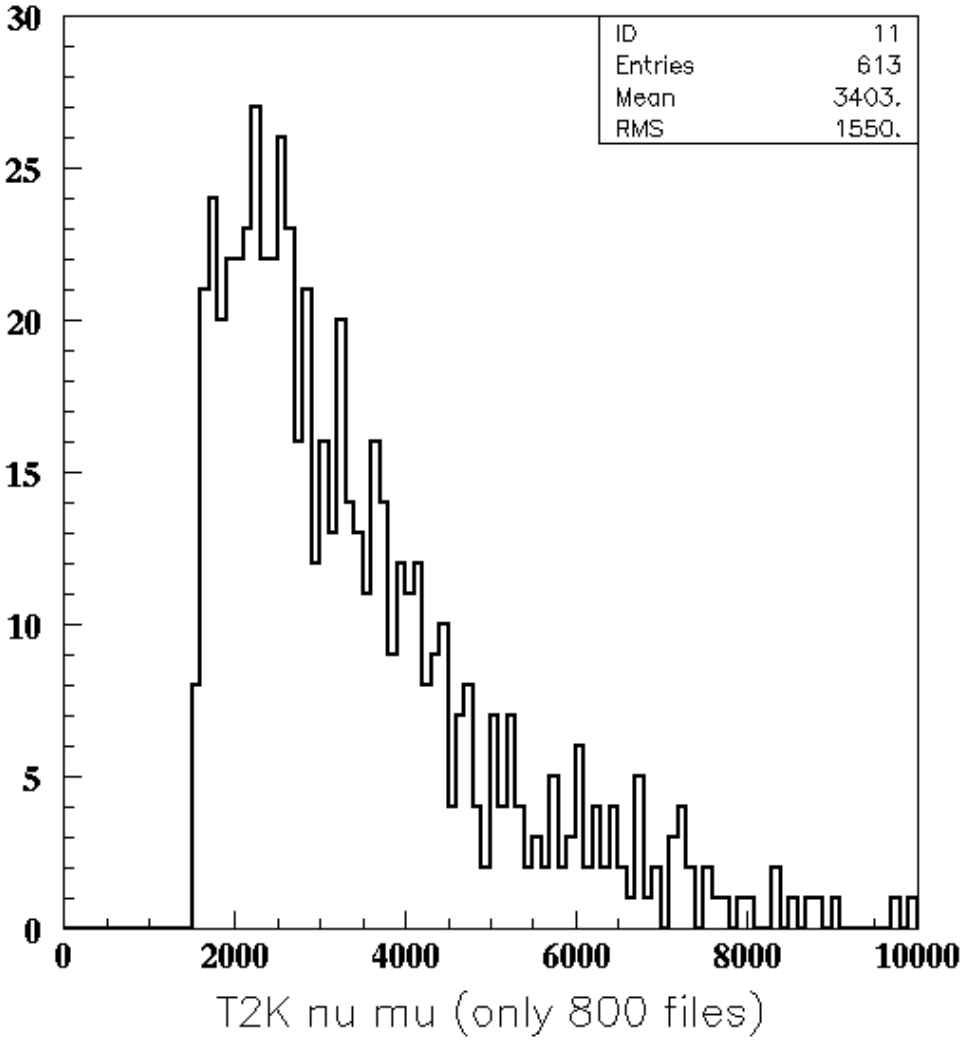
Backups

E_rec plots Atm

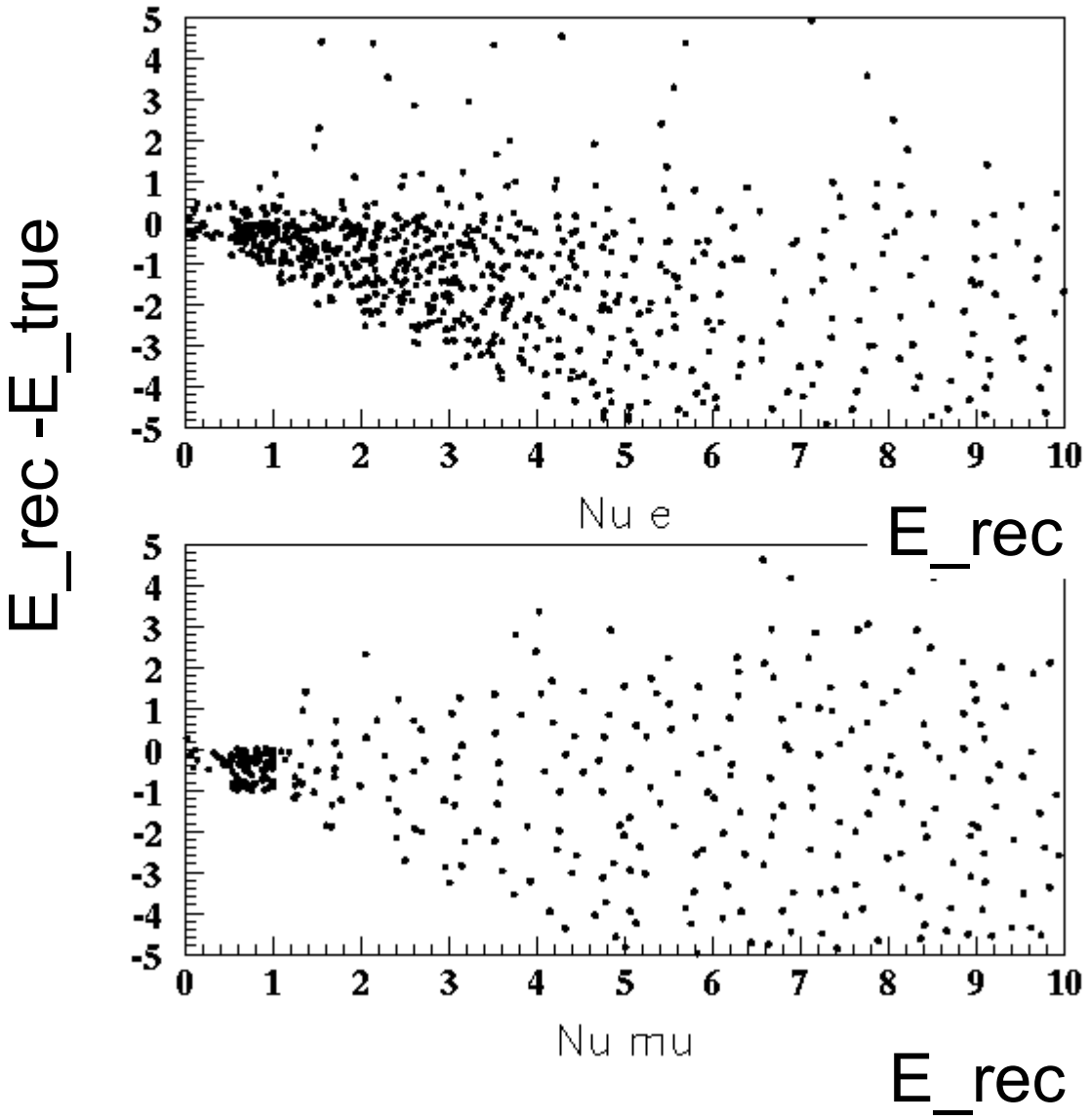


E_rec plots t2k





Smearing function



Maxim's plot: (not added)

I fixed my bug, I can now simulate ν_e events from beam ν_e