Status report
- and lots of questions...

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Outline

- Background normalization computation...
  remaining questions.
- Oscillation analysis
  some questions as well.
- SK-II MC

Background computation

From Okumura-san's I know that:

* normalize to 1Mtonx1yr event spectrum (from nunokawa-table)
* kam nue 37148.4 ev/1Mton/1yr (0-1.5GeV)
* kam nueb 10874.8 ev/1Mton/1yr (0-1.5GeV)
* korea nue 2932.3 ev/1Mton/1yr (0-1.5GeV)
* korea nueb 858.4 ev/1Mton/1yr (0-1.5GeV)

Nakayama-san and his answer was:

* 0.27Mton*yr (with 4MW beam) at Kamioka .
*The numbers of single-ring mu-like events with
*0.2-1.5 GeV neutrino energy are
*nu beam : 8144.65
*anti-nu beam : 3143.31 .

which are basically the same once I renormalize to 1Mton.

Question: Am I wrong to think I need two different sets of numbers? I think I am wrong but.....

What to do then?

So far, my likelihood is defined as:

$$\frac{\text{events who pass every cuts (4 precuts + likelihood)}}{\text{events who pass all precuts (FCFV, e-like, 1-ring,no decay\_e)}}$$

If I want to use the normalization stated before then the likelihood efficiency must be:

$$\frac{\text{events who pass every cuts (4 precuts + likelihood)}}{\text{all single-ring events (FCFV? no decay\_e?)}}$$

Question: Right?
What about FCFV and no decay_e?

Remaining questions

Nakayama-san gives e-like and mu-like events numbers.

Question: Can I use the e-like number and use the previous definition of my likelihood efficiency?

Oscillation analysis

- I modified every scripts and kumac in order to do the off-angle analysis (rename file_oa.sh or file_oa.kumac)

Question: Which value of dm, and distance should I use?
distance = 1050km?
dm=2.5?

- Everything seems to be working fine.

(I started even if my background spectrum was wrong just to check that the tools were working and to know how much time I needed)

- One step (loop_fraction.sh) seems to take long (around 8h)

Question: Is any other step time consuming or is it the only one?

SK-II MC

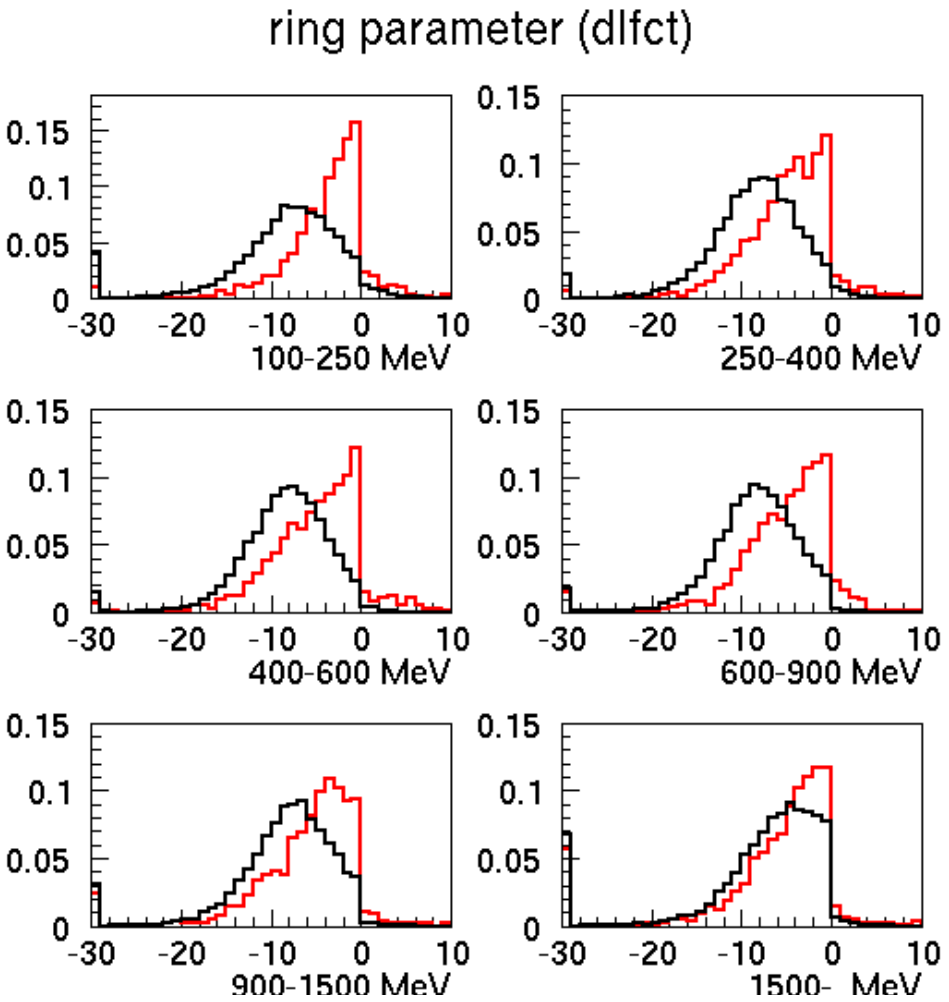
In order to do a study of of 20% pmt coverage vs. 40% pmt coverage, I used SK-II ATM MC and computed the likelihood efficiency.

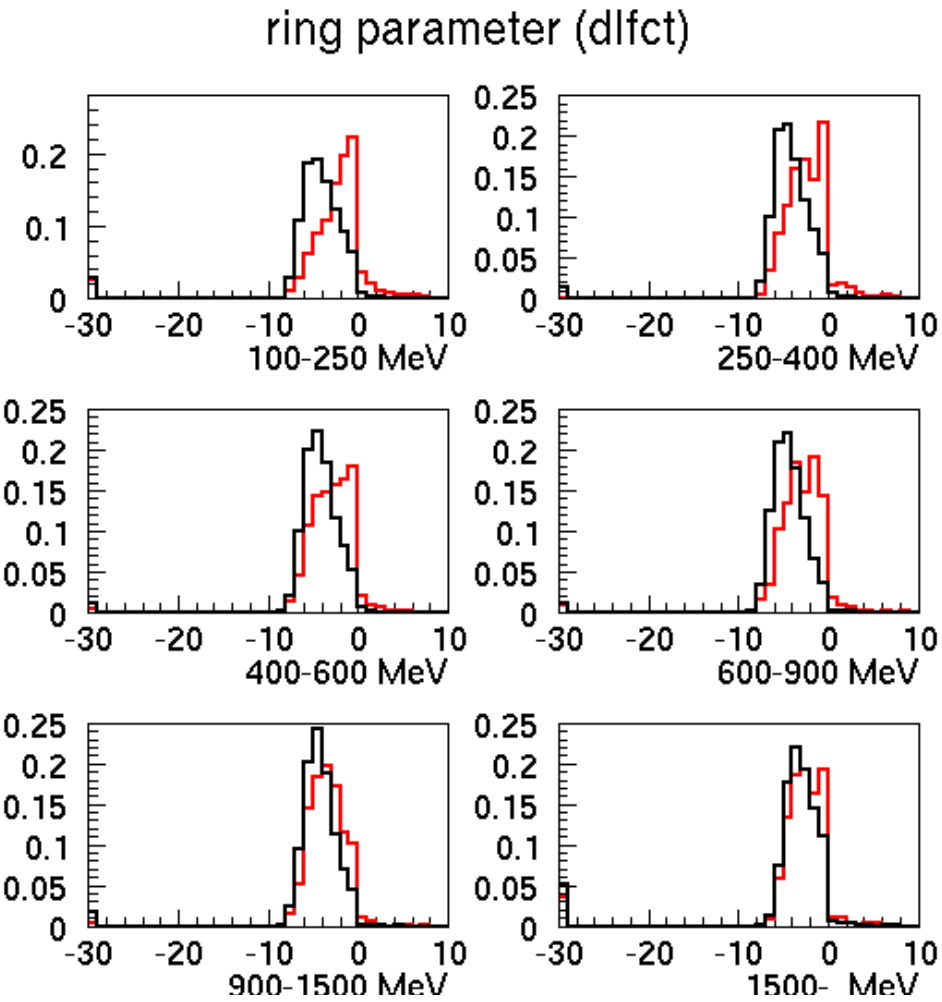
All plots are located at
http://hep.bu.edu/~fdufour/t2kk
in official plots.

But here are some of them:

NB: in order to improve the SK-II likelihood, some of the binning should be changed, but I will not do it now, since it would be time consuming.

Ring counting parameter:



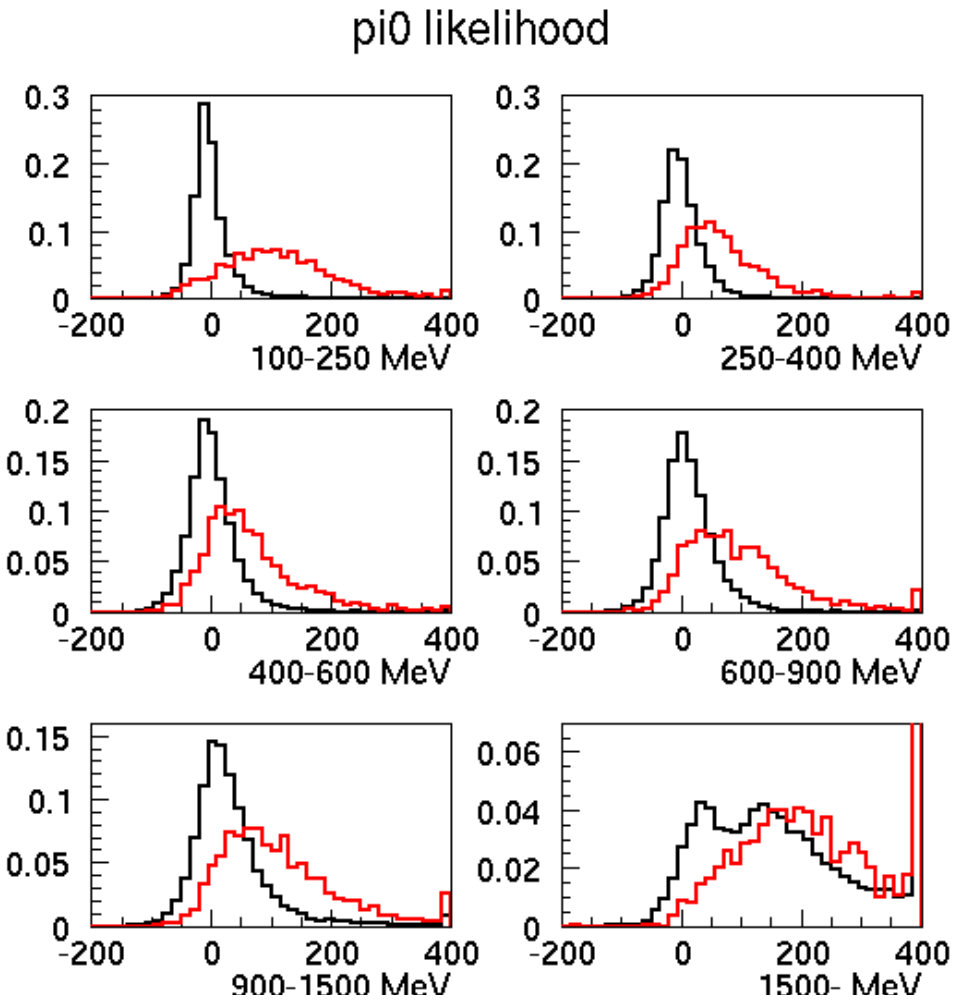


SK-I

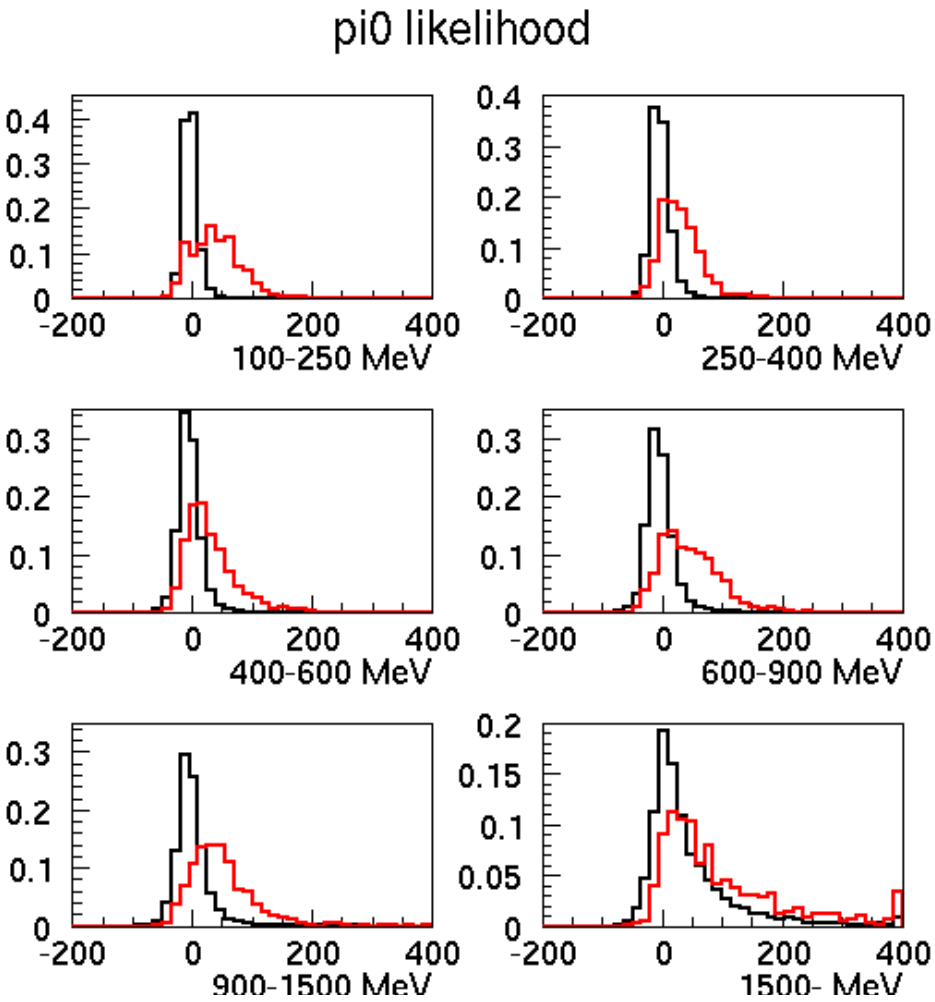
SK-II

SK-II probably better after rebinning

Polfit Likelihood parameter:

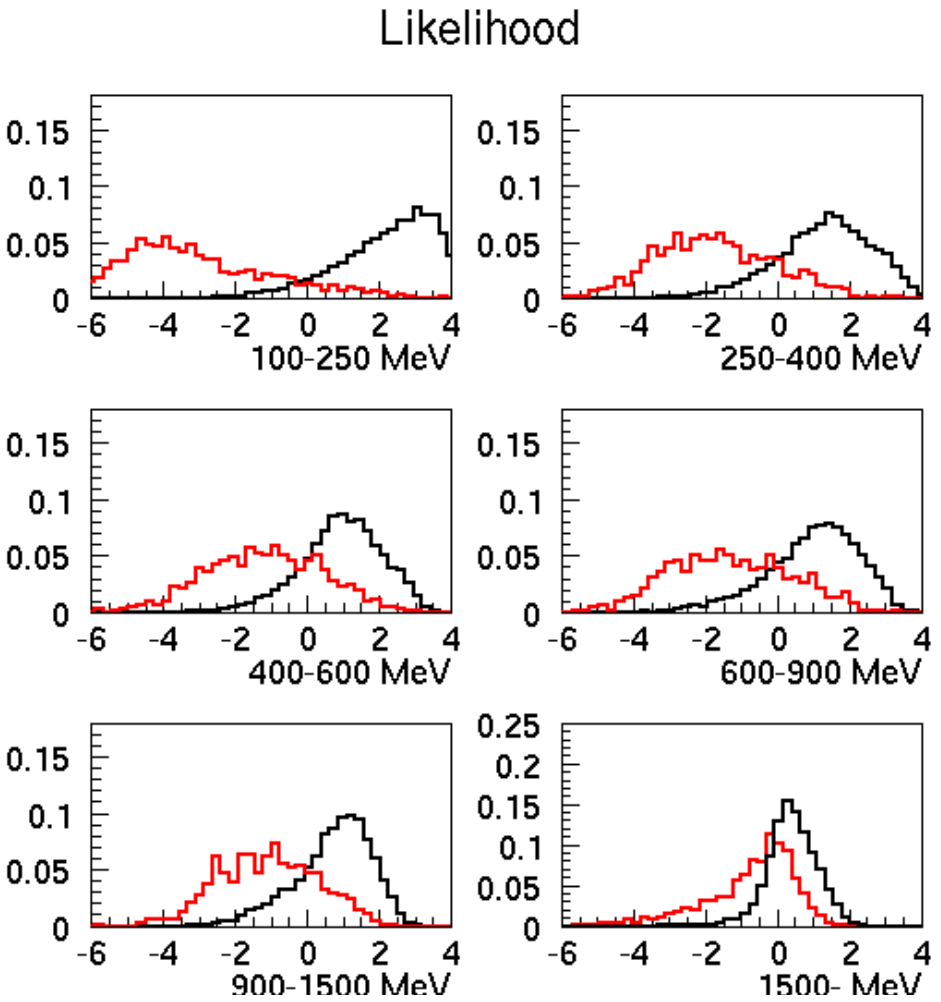


SK-I

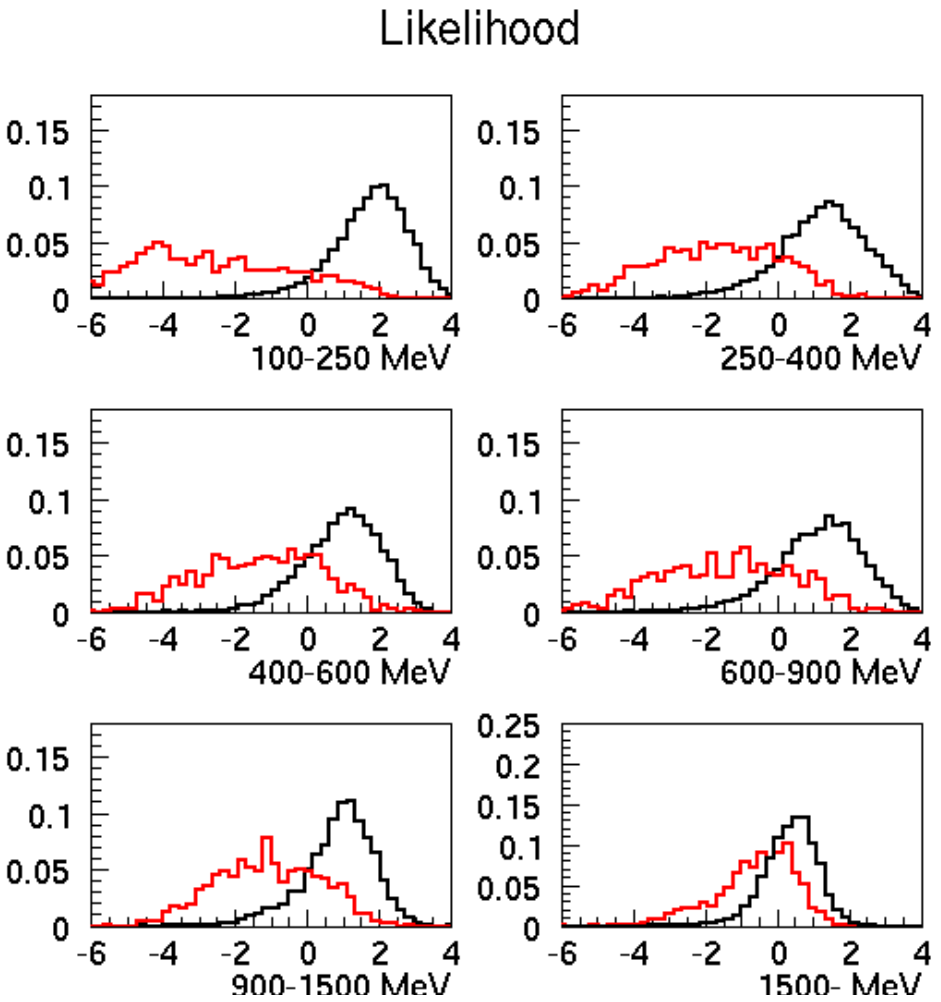


SK-II

Likelihood results:



SK-I



SK-II

Efficiency tables:

Rec Enu	0~0.35	0.35~0.85	0.85~1.5	1.5~
SK-I:				
Nu-mu CC efficiency	15.5%	30.4%	11.6%	13.5%
NC efficiency	9.9%	21.3%	23.6%	34.7%
Nu-e CC efficiency	90.5%	83.7%	79.6%	76.4%
SK-II:				
Nu-mu CC efficiency	19.0%	37.7%	30.3%	15.8%
NC efficiency	14.2%	21.5%	24.3%	37.0%
Nu-e CC efficiency	92.4%	84.8%	84.2%	73.6%