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group meeting
13 September 2017

which neut card?

ncgamma 5.1.4.2 neut_num.card	5.3.2 t2kflux_zbx/Cards/neut_numu.card	definition	action
NEBM-NEVNT 3000	NEBM-NEVNT 100000	number of events	Huang-san said 3000
NEUT-MODL 1	-	low energy pion mean free path models	
NEUT-MODH 1	-	high energy pion mfp models	
NEUT-FEFQE 1	-	Factor to modify pion quasi-elastic scattering mean free path	
NEUT-FEFABS 1.1	-	Factor to modify pion absorption mean free path	
NEUT-FEFINEL 1.	-	Factor to modify pion hadron production mean free path	
NEUT-FEFCOH 1.	-	Factor to modify pion foward scattering mean free path	specific to ncgamma 5.1.4.2 neut_num.card (not in 5.1.4.2/t2kflux_zbs/Cards/neut_numu.card)
NEUT-FEFQEH 1.8	-	Factor to modify quasielastic scattering mean free path	
NEUT-FEFCX 1.	-	Factor to modify charge exchange amplitude	supported in 5.3.2?
NEUT-FEFCXH 1.8	-	Factor to modify charge exchange mean free path	
NEUT-FEFQEHF 1.	-	Portion of QE scattering that has inelastic-like kinematics	
NEUT-FEFCXHF 0.	-	Portion of inel. scattering that includes true CX	
NEUT-FEFCOHF 0.	-	Amount of forward scatter relative to quasi-elastic	
NEUT-FEFCOUL 0	-	Pion trajectory modified by Coulomb field	
NEUT-RAND 0 NEUT-RAND 1	NEUT-RAND 1	random seed from FILE or the time	repeated and different?
Nucleon rescattering repeated	n/a	-	repeated and same?
-	NEUT-CRS 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	Multiplied factor to cross section on each mode. (neu)	no change because multiplying by 1
-	NEUT-CRSB 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	Multiplied factor to cross section on each mode. (neu-bar)	

which neut card?

From Hayato-san's response, I edited t2kflux_zbs/Cards/**neut_numu.card**

1) NEUT-FEF* from neut_num.card on ncgamma svn with 5.1.4.2
→ most of the time not important for ncgamma gamma, but
gammas emitted if the pions are absorbed may make small differences

2) lines needed for dumptotpau
EVCT-IDPT 14
EVCT-MPOS 2
EVCT-RAD 100.
EVCT-MDIR 1
EVCT-DIR 0. 0. 1.
EVCT-MPV 1
EVCT-PV 600.

3) NEUT-MDLQE 402
→ to be consistent with ND280, which used spectral function mode and thus both CCQEand NCEL are using spectral function model consistently. However, those are reweighted to CCQE and we are not sure how correct the NCEL cross-section is

4) (NEBM-NEVNT 3000 instead of 100000)

dumptotpau for cross section table

- (last time I had an error because I was running from the wrong directory)

- ./dumptotpau ../../t2kfluz_zbs/neut_num.card

```
Loading Cross section table for Multi-Pi productin
 ---> Loading GRV98 modified version
open: No such file or directory
apparent state: unit 87 named ./98mod_p.dat
last format: list io
lately writing sequential formatted external IO
Abort (core dumped)
```

looked into it a little…

grep –r productin src/*

neutcore/fnapicrs.F

what is crstblpath?

find src/ -name "98mod_p.dat"
- src/neututils/calc_dis_crs/98mod_p.dat
- src/neutsmpl/98mod_p.dat
- src/t2kflux_zbs/98mod_p.dat
- src/crsdat/98mod_p.dat

all 4 are identical

```fortran
if (iloadcrs.eq.0) then
    print*, 'Loading Cross section table for Multi-Pi productin'
    if(nepdf.eq.7.and.nebodek.eq.0) then ! GRV94 original
        print*, '---> Loading GRV94 orginal version'
        fname = crstblpath(1:lenpath)//'94org_p.dat'
        open(81,file=fname,form='formatted',status='old')
        fname = crstblpath(1:lenpath)//'94org_pn.dat'
        open(82,file=fname,form='formatted',status='old')
        lunpcrs = 81
        lunpncrs = 82
    elseif(nepdf.eq.7.and.nebodek.eq.1) then ! GRV94 Bodek corr.
        print*, '---> Loading GRV94 modified version'
        fname = crstblpath(1:lenpath)//'94mod_p.dat'
        open(83,file=fname,form='formatted',status='old')
        fname = crstblpath(1:lenpath)//'94mod_pn.dat'
        open(84,file=fname,form='formatted',status='old')
        lunpcrs = 83
        lunpncrs = 84
    elseif(nepdf.eq.12.and.nebodek.eq.0) then ! GRV98 original
        print*, '---> Loading GRV98 original version'
        fname = crstblpath(1:lenpath)//'98org_p.dat'
        open(85,file=fname,form='formatted',status='old')
        fname = crstblpath(1:lenpath)//'98org_pn.dat'
        open(86,file=fname,form='formatted',status='old')
        lunpcrs = 85
        lunpncrs = 86
    elseif(nepdf.eq.12.and.nebodek.eq.1) then ! GRV98 Bodek corr.
        print*, '---> Loading GRV98 modified version'
        fname = crstblpath(1:lenpath)//'98mod_p.dat'
        open(87,file=fname,form='formatted',status='old')
        fname = crstblpath(1:lenpath)//'98mod_pn.dat'
        open(88,file=fname,form='formatted',status='old')
        lunpcrs = 87
        lunpncrs = 88
    endif
```

problem was that running from wrong directory

- src/neutsmpl/Linux_pc/
- ./dumptotpau ../../t2kflux_zbs/neut_num.card
- → ERROR

- src/neutsmpl/
- ./Linux_pc/dumptotpau ../t2kflux_zbs/neut_num.card
- → WORKED, generated totpau.tbl

In the meantime, Hayato-san said update NEUT

- changed to 5.3.2 since new Kamioka computer in February

- Hayato-san suggests 5.3.3 if planning to apply reweights (fix for reweight)
  https://www.t2k.org/asg/xsec/niwgdocs/neut/neut_5.3.3_maqefix_t2krw_v1r27p3.tar.gz (added 10 May 2017)

- Hayato-san suggests 5.3.3.x
- basically the same as 5.3.2, but (minor) bugs are fixed and reweight works

- start with 5.3.3.x and try 5.4.0 if it seems to be necessary

Trouble using 5.3.3

FC g77

- e.g., errors because REAL had two arguments instead of one argument
- I think gfortran can accept two arguments, whereas g77 accepts only one argument

→ asked Hayato-san if it's possible to make 5.3.3 compile with g77

Trouble using 5.3.3

FC gfortran

- I don't think that worked because things like
  CERN, ROOTSYS, SKOFL_ROOT, and ATMPD_ROOT were using g77
- If I try to switch from sklib_g77 to sklib_gcc4.8.5, I don't see 14c anymore

→ asked Hayato-san if I have to change to 16c

T2K-SK discussion in February

- 13a flux
- NEUT 5.3.2
- 14c SK software

- I'm hesitant to change NEUT and SK software again

Asked Hayato-san

→ for more information on the reweight fix for 5.3.3

→ if the reweight problem in 5.3.2 would affect ncgamma

→ if not, would I be able to continue to use 5.3.2?

Hayato-san email

- actually they hadn't checked whether it worked with g77

- he checked, modified it, and installed it as /usr/local/sklib_g77/neut_5.3.3_v1r27p3/

- he would have had to ask someone else about gfortran and 14c
(doesn't matter anyway, because we will use g77)