Weekly Report

CEPC Higgs->ZZ* analysis

-- Summarize the necessary background channels

-- Investigate “available” background samples and make a list

-- Prepare scripts to properly arrange the data samples to run

those procedures took much time than I have expected.

partly because the background samples are very under preparation (by MC/Software management group) and not organized well yet.

-- Currently, I am modifying my analysis code to adjust cut conditions etc. before running this huge background samples.

kiuchi@localhost:~

File Edit View Terminal Help

```
#
# Process                      Final states        Cross section [fb]    Events expected      Path                                                                                        Configuration    Filename tag
#
# 4 fermion background
#
zz_h0utut       ,     up up up up                    ,     83.09 ,     419604 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_h.e0.p0.whizard195/                        , CEPC_V4 , zz_h0utut.e0.p0
zz_h0dtdt       ,     down down down down            ,    226.20 ,    1142310 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_h.e0.p0.whizard195/                        , CEPC_V4 , zz_h0dtdt.e0.p0
zz_h0uu_notd    ,     uq uq (sq/bq) (sq/bq)          ,     95.65 ,     483032 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_h.e0.p0.whizard195/                        , CEPC_V4 , zz_h0uu_notd.e0.p0
zz_h0cc_nots    ,     cq cq  (dq/bq) (dq/bq)         ,     96.04 ,     485002 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_h.e0.p0.whizard195/                        , CEPC_V4 , zz_h0cc_nots.e0.p0
#
zz_sl0nu_up     ,     nu_mu/tau nu_mu/tau up up      ,     81.72 ,     412686 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_sl.e0.p0.whizard195/zz_sl0nu_up/           , CEPC_V4 , zz_sl0nu_up.e0.p0
zz_sl0nu_down   ,     nu_mu/tau nu_mu/tau down down  ,    134.86 ,     681043 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_sl.e0.p0.whizard195/zz_sl0nu_down/         , CEPC_V4 , zz_sl0nu_down.e0.p0
zz_sl0mu_up     ,     mu mu up up                    ,     82.38 ,     416019 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_sl.e0.p0.whizard195/zz_sl0mu_up/           , CEPC_V4 , zz_sl0mu_up.e0.p0
zz_sl0mu_down   ,     mu mu down down                ,    127.96 ,     646198 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_sl.e0.p0.whizard195/zz_sl0mu_down/         , CEPC_V4 , zz_sl0mu_down.e0.p0
zz_sl0tau_up    ,     tau tau up up                  ,     39.78 ,     200889 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_sl.e0.p0.whizard195/                       , CEPC_V4 , zz_sl0tau_up.e0.p0
zz_sl0tau_down  ,     tau tau down down              ,     64.30 ,     324715 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_sl.e0.p0.whizard195/                       , CEPC_V4 , zz_sl0tau_down.e0.p0
#
zz_l04tau       ,     tau tau tau tau                ,      4.38 ,      22119 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_l.e0.p0.whizard195/                        , CEPC_V4 , zz_l04tau.e0.p0
zz_l04mu        ,     mu mu mu mu                    ,     14.57 ,      73578 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_l.e0.p0.whizard195/                        , CEPC_V4 , zz_l04mu.e0.p0
zz_l0taumu      ,     tau tau mu mu                  ,     17.54 ,      88577 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_l.e0.p0.whizard195/                        , CEPC_V4 , zz_l0taumu.e0.p0
zz_l0mumu       ,     nu_tau nu_tau mu mu            ,     18.17 ,      91758 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_l.e0.p0.whizard195/                        , CEPC_V4 , zz_l0mumu.e0.p0
zz_l0tautau     ,     nu_mu nu_mu tau tau            ,      9.20 ,      46460 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzz_l.e0.p0.whizard195/                        , CEPC_V4 , zz_l0tautau.e0.p0
#
#ww_h0cuxx       ,     uq cq down down                ,   3395.48 ,   17147189 ,      not_generated_yet                                                                                ,          ,
#ww_h0uubd       ,     uq uq dq bq                    ,      0.05 ,        252 ,      not_generated_yet                                                                                ,          ,
#ww_h0uusd       ,     uq uq sq bq                    ,    165.94 ,     837997 ,      not_generated_yet                                                                                ,          ,
#ww_h0ccbs       ,     cq cq sq bq                    ,      5.74 ,      28987 ,      not_generated_yet                                                                                ,          ,
#ww_h0ccds       ,     cq cq sq dq                    ,    165.57 ,     836128 ,      not_generated_yet                                                                                ,          ,
ww_h0cuxx       ,     uq cq down down                ,   3395.48 ,   17147189 ,     /cefs/dirac/user/b/byzhang/ww_h/cuxx_01/rec/                                                     ,      V1 , ww_h0cuxx.e0.p0
ww_h0uubd       ,     uq uq dq bq                    ,      0.05 ,        252 ,     /cefs/dirac/user/b/byzhang/RecData/ww_h/uubd/                                                    ,      V1 , Pww_h0uubd.e0.p0
ww_h0uusd       ,     uq uq sq bq                    ,    165.94 ,     837997 ,     /cefs/dirac/user/b/byzhang/RecData/ww_h/uusd/                                                    ,      V1 , E250.Pww_h0uusd.e0.p0
ww_h0ccbs       ,     cq cq sq bq                    ,      5.74 ,      28987 ,     /cefs/dirac/user/b/byzhang/RecData/ww_h/ccbs/                                                    ,      V1 , Pww_h0ccbs.e0.p0
ww_h0ccds       ,     cq cq sq dq                    ,    165.57 ,     836128 ,     /cefs/dirac/user/b/byzhang/RecData/ww_h/ccds/                                                    ,      V1 , E250.Pww_h0ccds.e0.p0
#
ww_sl0muq       ,     mu nu_mu up down               ,   2358.69 ,   11911394 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pww_sl.e0.p0.whizard195/                       , CEPC_V4 , ww_sl0muq.e0.p0
ww_sl0tauq      ,     tau tau_nu up down             ,   2351.98 ,   11877519 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pww_sl.e0.p0.whizard195/                       , CEPC_V4 , ww_sl0tauq.e0.p0
ww_l0ll         ,     mu tau nu_mu nu_tau            ,    392.96 ,    1984448 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pww_l.e0.p0.whizard195/                        , CEPC_V4 , ww_l0ll.e0.p0
#
#zzorww_h0udud   ,     uq uq dq dq                    ,   1570.40 ,    7930514 ,     not_generated_yet                                                                                ,
#zzorww_h0cscs   ,     cq cq sq sq                    ,   1568.94 ,    7923141 ,     not_generated_yet                                                                                ,
zzorww_h0udud   ,     uq uq dq dq                    ,   1570.40 ,    7930514 ,     /cefs/dirac/user/b/byzhang/zzorww_h/sim_01/rec/                                                  , CEPC_V4 , zzorww_h0udud.e0.p0
zzorww_h0cscs   ,     cq cq sq sq                    ,   1568.94 ,    7923141 ,     /cefs/dirac/user/b/byzhang/zzorww_h/sim_01/rec/                                                  , CEPC_V4 , zzorww_h0cscs.e0.p0
zzorww_l0mumu   ,     mu mu nu_mu nu_mu              ,    214.81 ,    1084790 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzzorww_l.e0.p0.whizard195/                    , CEPC_V4 , zzorww_l0mumu.e0.p0
zzorww_l0tautau ,     tau tau nu_tau nu_tau          ,    205.84 ,    1039492 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pzzorww_l.e0.p0.whizard195/                    , CEPC_V4 , zzorww_l0tautau.e0.p0
#
sze_l0tau       ,     e e tau tau                    ,    150.14 ,     758207 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psze_l.e0.p0.whizard195/                       , CEPC_V4 , sze_l0tau.e0.p0
sze_l0mu        ,     e e mu mu                      ,    852.18 ,    4303527 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psze_l.e0.p0.whizard195/                       , CEPC_V4 , sze_l0mu.e0.p0
sze_l0nunu      ,     e e nu_mu/tau nu_mu/tau        ,     29.62 ,     149581 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psze_l.e0.p0.whizard195/                       , CEPC_V4 , sze_l0nunu.e0.p0
#
sze_sl0uu       ,     e e up up                      ,    195.86 ,     989093 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psze_sl.e0.p0.whizard195/                      , CEPC_V4 , sze_sl0uu.e0.p0
sze_sl0dd       ,     e e down down                  ,    128.72 ,     650036 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psze_sl.e0.p0.whizard195/                      , CEPC_V4 , sze_sl0dd.e0.p0
#
sznu_l0mumu     ,     nu_e nu_e mu mu                ,     43.33 ,     218816 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psznu_l.e0.p0.whizard195/                      , CEPC_V4 , sznu_l0mumu.e0.p0
sznu_l0tautau   ,     nu_e nu_e tau tau              ,     14.57 ,      73578 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psznu_l.e0.p0.whizard195/                      , CEPC_V4 , sznu_l0tautau.e0.p0
#
sznu_sl0nu_up   ,     nu_e nu_e up up                ,     56.09 ,     283254 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psznu_sl.e0.p0.whizard195/                     , CEPC_V4 , sznu_sl0nu_up.e0.p0
sznu_sl0nu_down ,     nu_e nu_e down down            ,     91.28 ,     460964 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psznu_sl.e0.p0.whizard195/                     , CEPC_V4 , sznu_sl0nu_down.e0.p0
#
sw_l0mu         ,     e nu_e mu nu_mu                ,    429.20 ,    2167446 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psw_l.e0.p0.whizard195/                        , CEPC_V4 , sw_l0mu.e0.p0
sw_l0tau        ,     e nu_e tau nu_tau              ,    429.42 ,    2168556 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psw_l.e0.p0.whizard195/                        , CEPC_V4 , sw_l0tau.e0.p0
#
sw_sl0qq        ,     e nu_e up down                 ,   2579.31 ,   13025535 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Psw_sl.e0.p0.whizard195/                       , CEPC_V4 , sw_sl0qq.e0.p0
#
szeorsw_l0l     ,     e e nu_e nu_e                  ,    249.34 ,    1259167 ,     /cefs/data/DstData/CEPC240/CEPC_v4/4fermions/E240.Pszeorsw_l.e0.p0.whizard195/                   , CEPC_V4 , szeorsw_l0l.e0.p0
#
:
```

CMOS pixel sensor

-- a meeting on Wednesday about the status of JadePix1

https://indico.ihep.ac.cn/event/8558/

-- discussion about the preparation for (B1-B8)

→ As expected, the new board will be tested in next week.

→ For my side, need to finish the (the very first version of) preparation of the firmware which can connect B1-B8

-- Purchasing the mother/daughter boards ?

-- How about to think about the B9-B16 (or A11-A16 or A19 ?)

Reference : The matrix information (from the Jadepix1 manual)

Matrix “A”

Now we have.

附件 1：Matrix-1 子阵列参数

Sector	*Diode surface*	*Footprint*	*Structure*
A1	4 μm^2	30 μm^2	2T_nmos
A2	8 μm^2	30 μm^2	2T_nmos
A3	15 μm^2	30 μm^2	2T_nmos
A4	4 μm^2	20 μm^2	2T_nmos
A5	8 μm^2	20 μm^2	2T_nmos
A6	15 μm^2	20 μm^2	2T_nmos
A7	4 μm^2	15 μm^2	2T_nmos
A8	8 μm^2	15 μm^2	2T_nmos
A9	15 μm^2	15 μm^2	2T_nmos
A10	3 μm^2	11 μm^2	2T_nmos
A11	4 μm^2	11 μm^2	2T_nmos
A12	8 μm^2	11 μm^2	2T_nmos
A13	4 μm^2	30 μm^2	2T_pmos
A14	8 μm^2	11 μm^2	2T_pmos
A15	4 μm^2	30 μm^2	3T_nmos
A16	8 μm^2	11 μm^2	3T nmos

Sector	*Pixel structure*	*Purpose*
A17	2T_nmos, CS_FEE	Amp study
A18	2T_nmos, CS_FEE	Amp study
A19	2T_pmos, amplifier	Amp study
A20	AC coupling sensor	DMAPS

we will have

Matrix “B”

附件 2：Matrix-2 子阵列参数

Sector	*Diode surface*	*Footprint*	*Structure*
B1	3 μm^2	20 μm^2	2T_nmos
B2	4 μm^2	20 μm^2	2T_nmos
B3	8 μm^2	20 μm^2	2T_nmos
B4	3 μm^2	15 μm^2	2T_nmos
B5	4 μm^2	15 μm^2	2T_nmos
B6	8 μm^2	15 μm^2	2T_nmos
B7	3 μm^2	11 μm^2	2T_nmos
B8	4 μm^2	11 μm^2	2T_nmos
B9	8 μm^2	11 μm^2	2T_nmos
B10	3 μm^2	8 μm^2	2T_nmos
B11	4 μm^2	8 μm^2	2T_nmos
B12	8 μm^2	8 μm^2	2T_nmos
B13	8 μm^2	20 μm^2	2T_pmos
B14	4 μm^2	8 μm^2	2T_pmos
B15	8 μm^2	20 μm^2	3T_nmos
B16	4 μm^2	8 μm^2	3T_nmos

difference is only pixel size

“A” : 33 μm x 33 μm <==> “B” : 16 μm x16 μm