Status report

16/04/2021 Keita Yumino

This week’s work

- **python: memory leak problem**

  try to fix with Daniel-san using getrusage(RUSAGE_SELF)
  but it’s not easy to solve because the cause has not been clarified…

- **SMEFT samples**

  1. **SM**
  2. **SMEFTsim_A_general_alphaScheme_UFO_v2**
  3. **SMEFTsim_A_general_MwScheme_UFO_v2**

```
| Switching to model 'SMEFTsim_A_general_alphaScheme_UFO_v2' (generated from UFO source)
+  IDENTIFIER  <variable>  = e1
*******************************************************************
*** ERROR: This PDG-array variable is undefined at this point
*******************************************************************
|              (WHIZARD run continues)
*******************************************************************
*******************************************************************
*** FATAL ERROR: Polarized: listed particles must be unique
*******************************************************************
*******************************************************************
```

SMEFTsim_A_general_alphaScheme_UFO_v2/particles.py

```
e__minus__ = Particle(pdg_code = 11,
                      name = 'e-',
                      antiname = 'e+',
                      spin = 2,
                      color = 1,
                      mass = Param.Me,
                      width = Param.ZERO,
                      texname = 'e-',
                      antitexname = 'e+',
                      charge = -1,
                      GhostNumber = 0,
                      LeptonNumber = 1,
                      Y = 0)

e__plus__ = e__minus__.anti()
```

definition of particle names were different from SM

easy mistake…

```
polarized e1, e2 , e3, u, d, c, s, t, n1, n2, n3, E1, E2,
E3, U, D, C, S, T, N1, N2, N3, "W+", "W-", Z, A
```

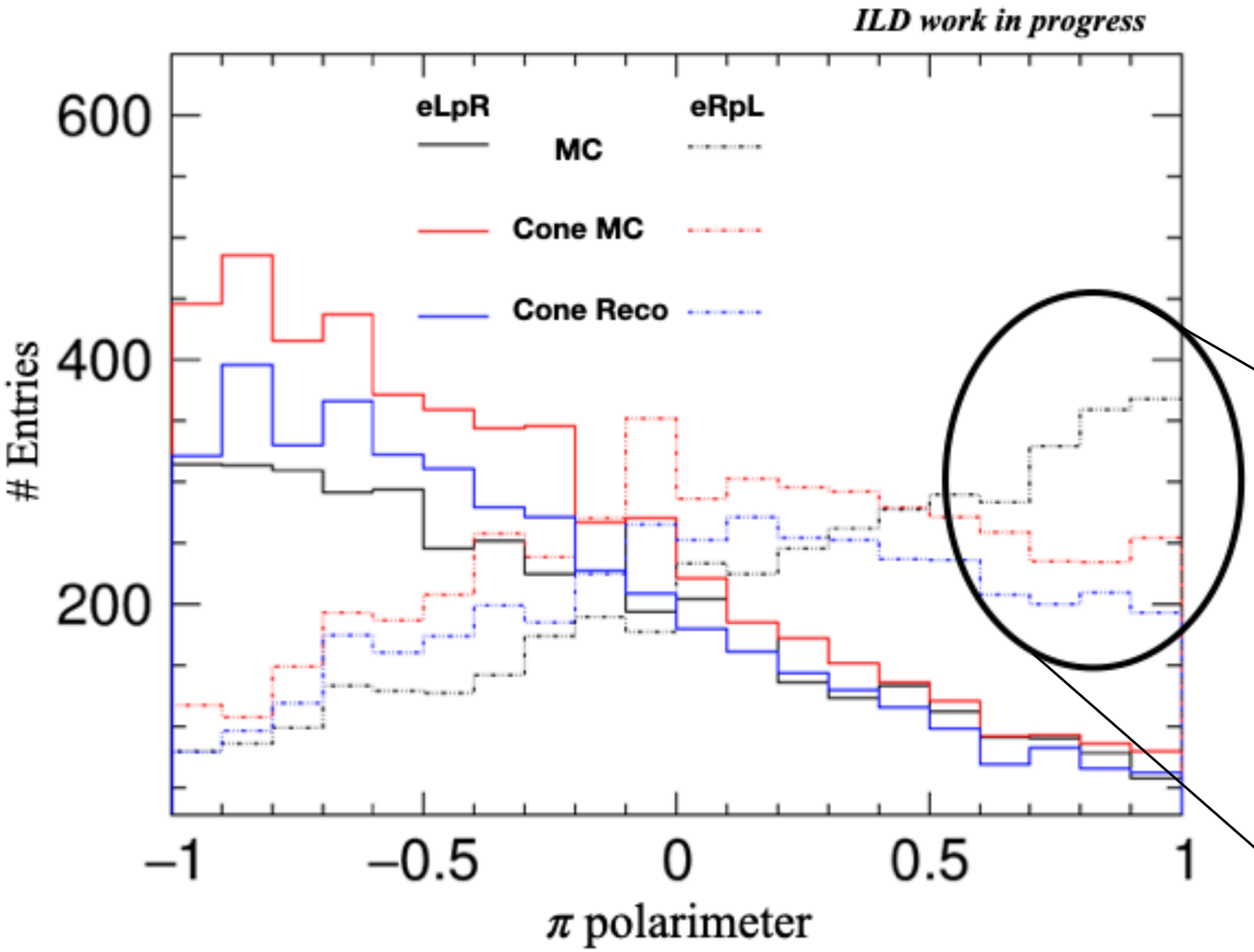


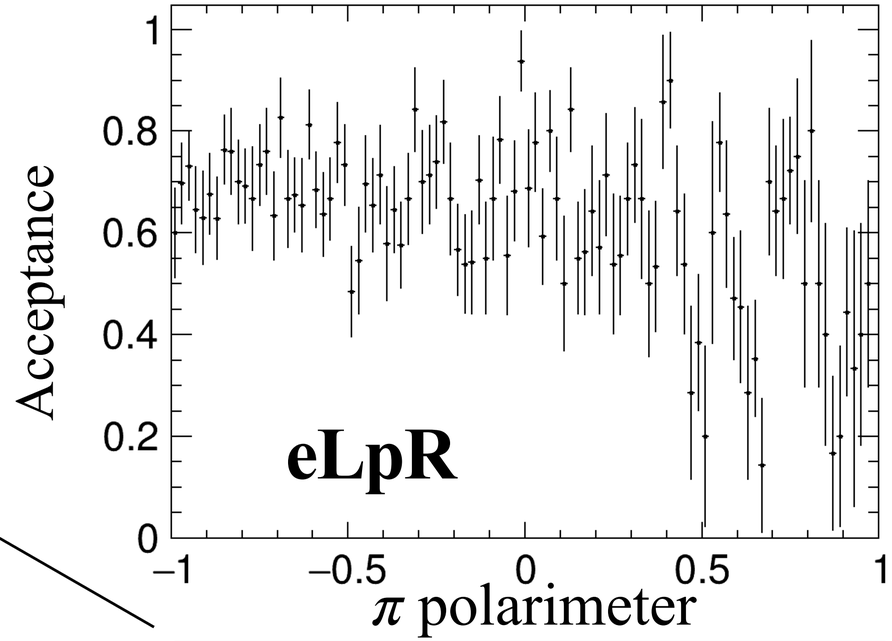
```
polarized "e-", "mu-", "ta-", "u", "d", "c", "s",
"t", "ve", "vm", "vt", "e+", "mu+", "ta+", "u~",
"d~", "c~", "s~", "t~", "ve~", "vm~", "vt~" , "W+",
"W-", "Z", "a"
```

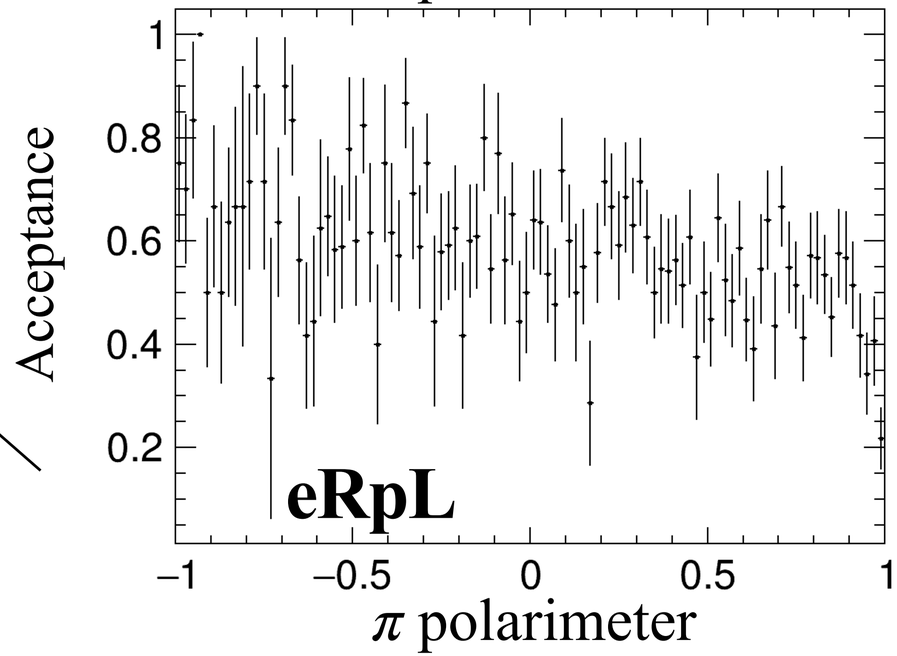
```
| Switching to model 'SMEFTsim_A_general_alphaScheme_UFO_v2' (generated from UFO source)
| Particle e- declared as polarized
| Particle mu- declared as polarized
| Particle ta- declared as polarized
?polarized_events = true
```

it works!!

in the region of polarimeter = 1, cone size will be small because of high energy pion

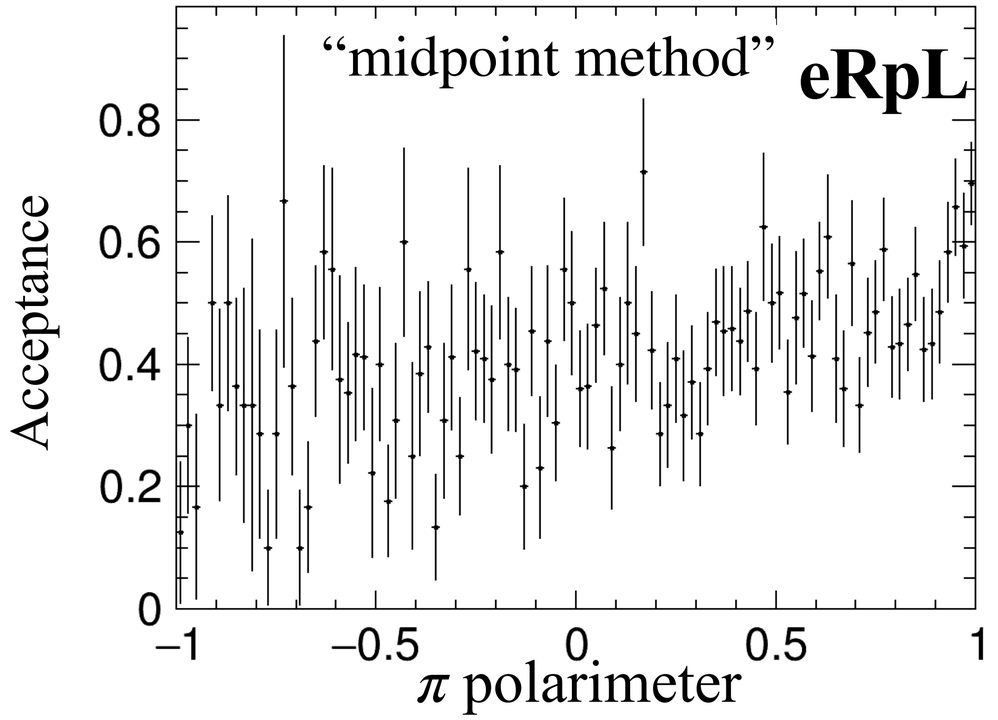


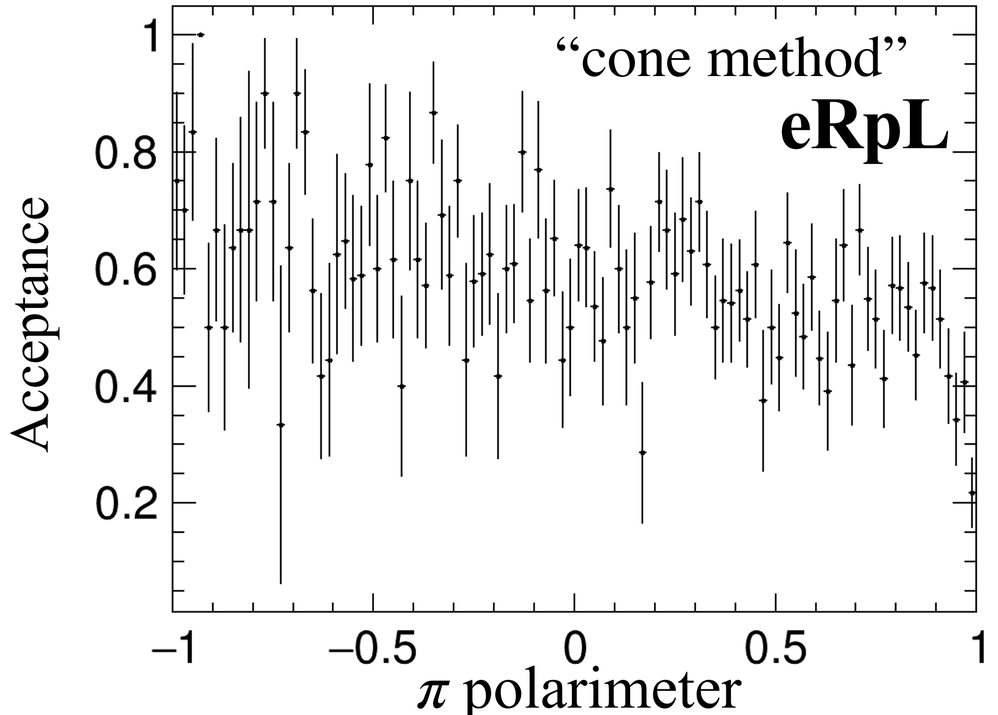


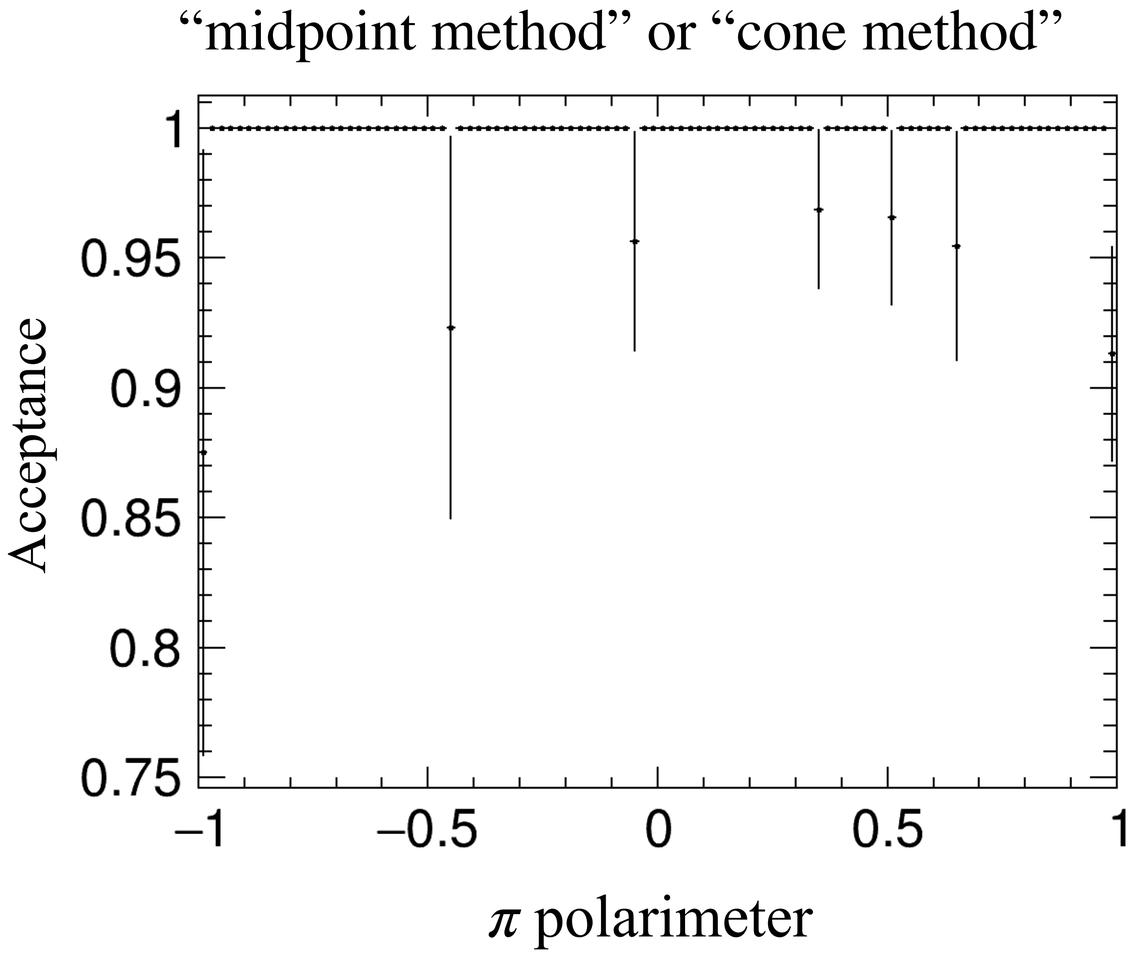


eLpR: almost flat?

eRpL: less likely to find solutions


“midpoint method”
eRpL
Acceptance
0.8
0.6
0.4
0.2
0
–1
–0.5
0
0.5
1
π polarimeter


“cone method”
eRpL
Acceptance
1
0.8
0.6
0.4
0.2
–1
–0.5
0
0.5
1
π polarimeter


“midpoint method” or “cone method”
Acceptance
1
0.95
0.9
0.85
0.8
0.75
–1
–0.5
0
0.5
1
π polarimeter

This week's work

- **Tau decay mode selection at ILC250**

  efficiency is not good… (~ 78 % for e&mu decay)

  →try to improve **cf. ~98 % at ILC500**

  forgot to include MyIsolatedLeptonTaggingProcessor
  →still not good

I've made some changes from previous files
so I'm now working on investigation of this problem

Plan

- python: memory leak problem

  for now, I will put this off…

- SMEFT

  generate events: DONE!

  →check $\cos\theta_{\tau_L^-}$ and $\cos\theta_{\tau_R^-}$ for eLpR and eRpL

  and compare
  - **SM**
  - **Alpha Scheme**
  - **Mw Scheme**

- neutrino reconstruction

  use impact parameter information

- Tau decay mode selection

  need further improvement