

FPCCD digitizer & $ZH \rightarrow l\bar{l}H$

Asian physics and software meeting

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FPCCD digitizer

Status

Current Status

- I am trying to fix my code of digitizer.
- Kamai-kun try to create single particle events.

Problem

- The following message was appeared at function whose name of “getMomAtLocalPos”.
- I do not know what is wrong.

```
/data16/jlc/ykohei/work2/ilcsoft/Marlin/v00-10-04/bin/Marlin: symbol lookup error: /home/ykohei/work2/ilcsoft/Marlin
Reco/v00-15/lib/libMarlinReco.so: undefined symbol: _ZNK14FPCCDDigitizer16getMomAtLocalPosEPN5EVENT13SimTrackerHitEP
KN4gear14VXDLayerLayoutEd
Program exited with code 0177.
(gdb) █
```

ZH \rightarrow llH Analysis

Status

Previous

- New result was presented.
- Lepton ID had to be checked.

Today

- Lepton ID was checked using Generator Info.

Procedure of lepton ID

Procedure

1. The particle which has the most highest energy is selected.
2. The particle whose invariant mass with already selected particle is most nearest M_Z is selected.
3. Momentum > 20 GeV
4. selection cut with calorimeter →
5. The opposite charge is required.

e-channel

- $0.8 < (\text{Ecal} + \text{Hcal ene}) / \text{Mom} < 1.2$
- $\text{Ecal ene} / (\text{Ecal} + \text{Hcal ene}) > 0.9$

μ -channel

- $(\text{Ecal} + \text{Hcal ene}) / \text{Mom} < 0.25$

Is the lepton to which Z decays correctly selected by step 1?

→ Generator information of lepton was checked.

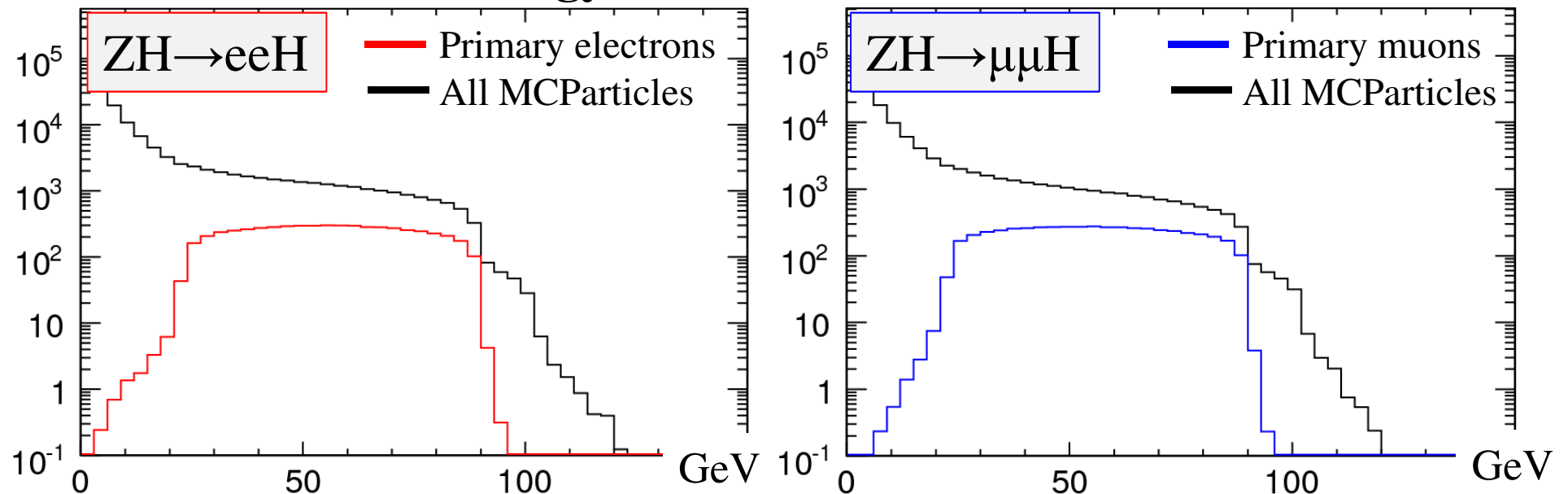
Primary lepton energy

Generator information of primary lepton energy was checked.

- There are particles whose energy is higher than the lepton's energy.

Particle	Parents of particle
tau	Higgs(25), ?(94)
gluon	Higgs(25), gluon(21),?(92)

The energy distribution of MCParticle



#Events that correctly select lepton

#Events that leptons were selected correctly at step1 was checked.

Most energetic	lepton	other particle
$ZH \rightarrow eeH$	1114	1662
$ZH \rightarrow \mu\mu H$	1318	1283

- The correct selection efficiency is about 50%.
→ We need another step before step1.

The energy distribution of Reconstructed Particle

