Higgs self-coupling analysis with H→WW*

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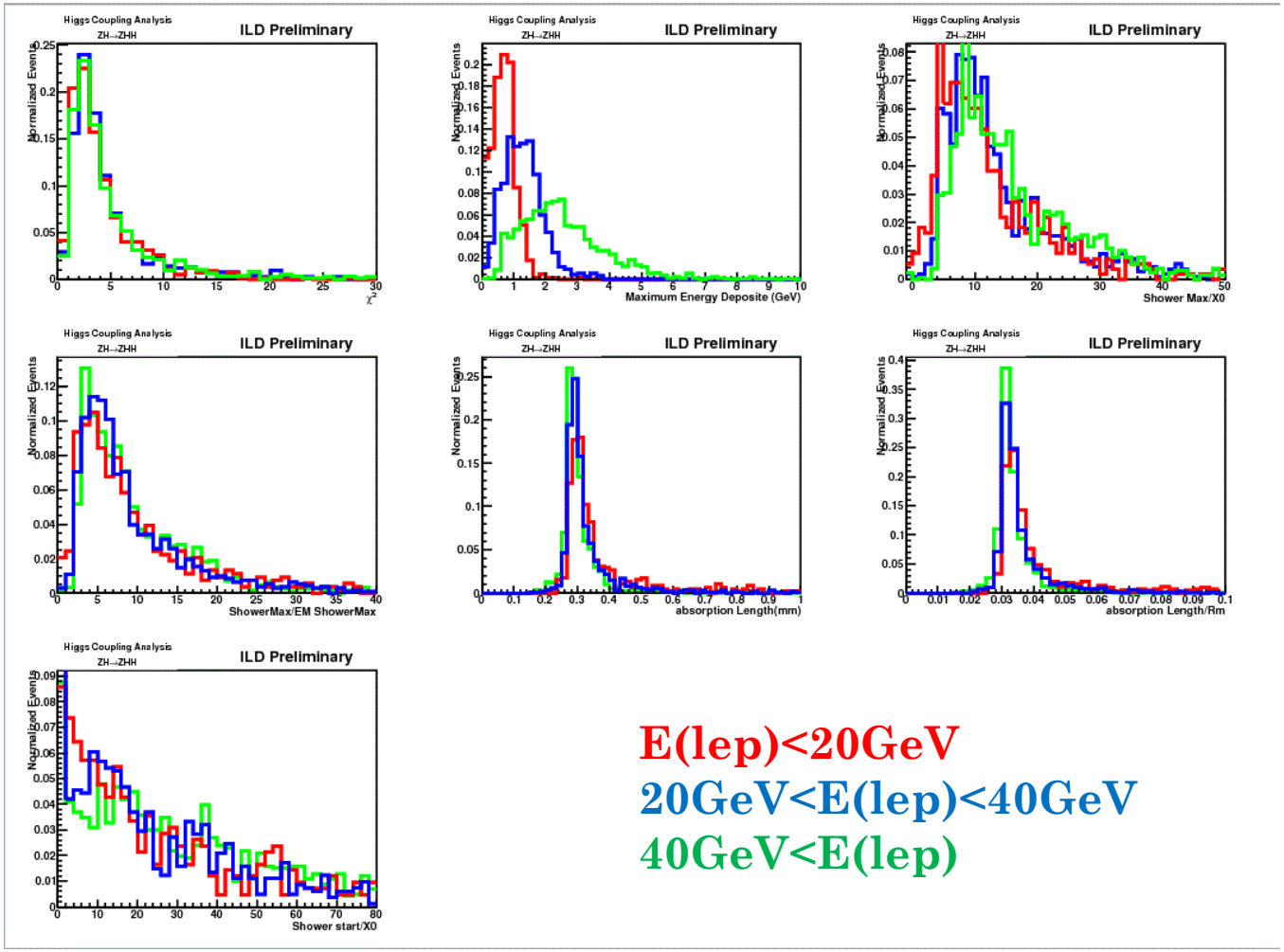
Studying Jet Properties

- Some people are interested in the track properties. And I will receive their help for the variable extraction
- dE/dx – pending, found it is very complicated. Needs basic study
- Shower profile – going on
  - As expected, radiation length I input is short. I need to learn it.
  - I check the energy dependence of shower profile and compare the particle dependence(pion, kaon and proton)
  - So far, configuration is wrong one. But relative difference will be OK.

Energy dependence of shower profile

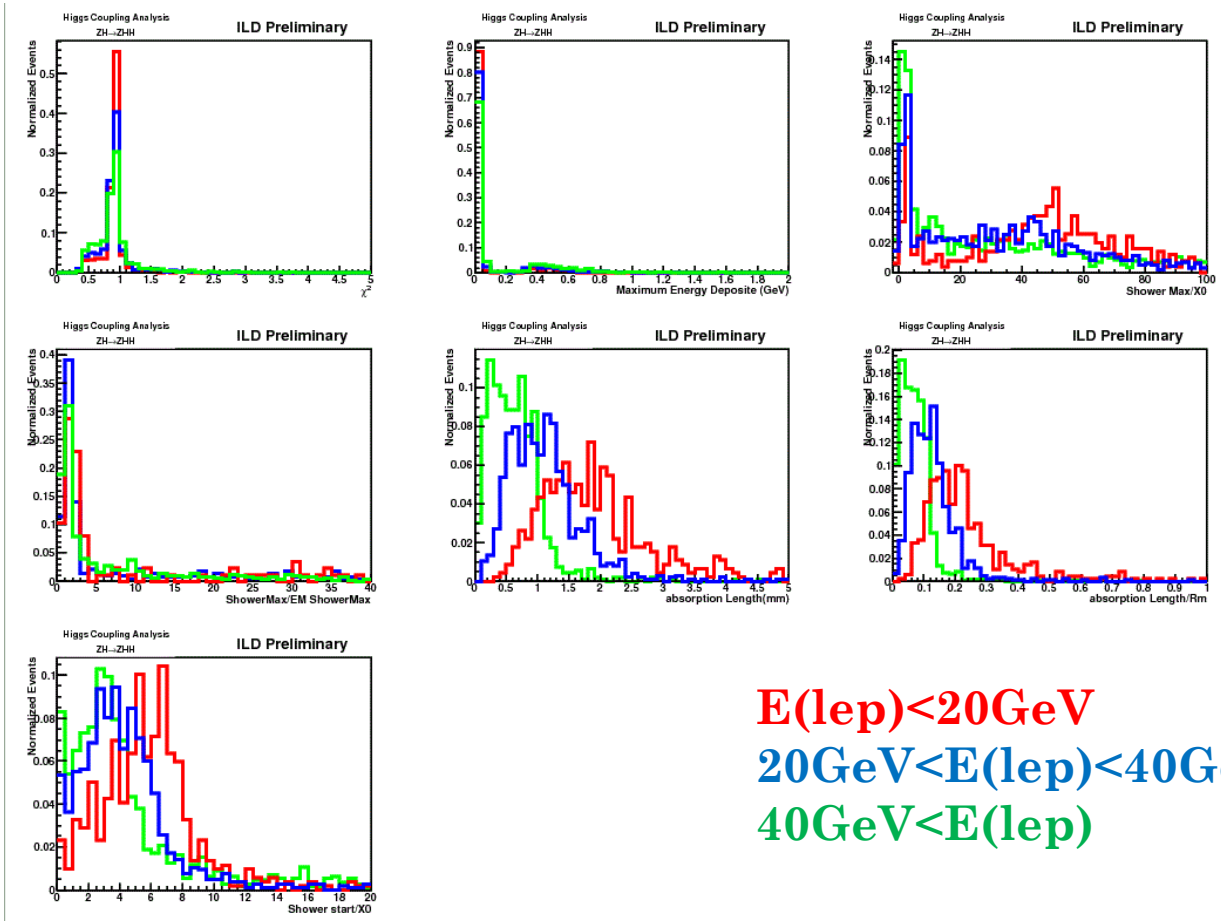
- Electron type
  - Maximum energy deposit become larger when high energy electron is coming(of course)
  - Shower is going deeper with higher energy electron(slightly), but energy dependence is disappeared when scaled with expected shower max.



E(lep)<20GeV
20GeV<E(lep)<40GeV
40GeV<E(lep)

Energy dependence of shower profile

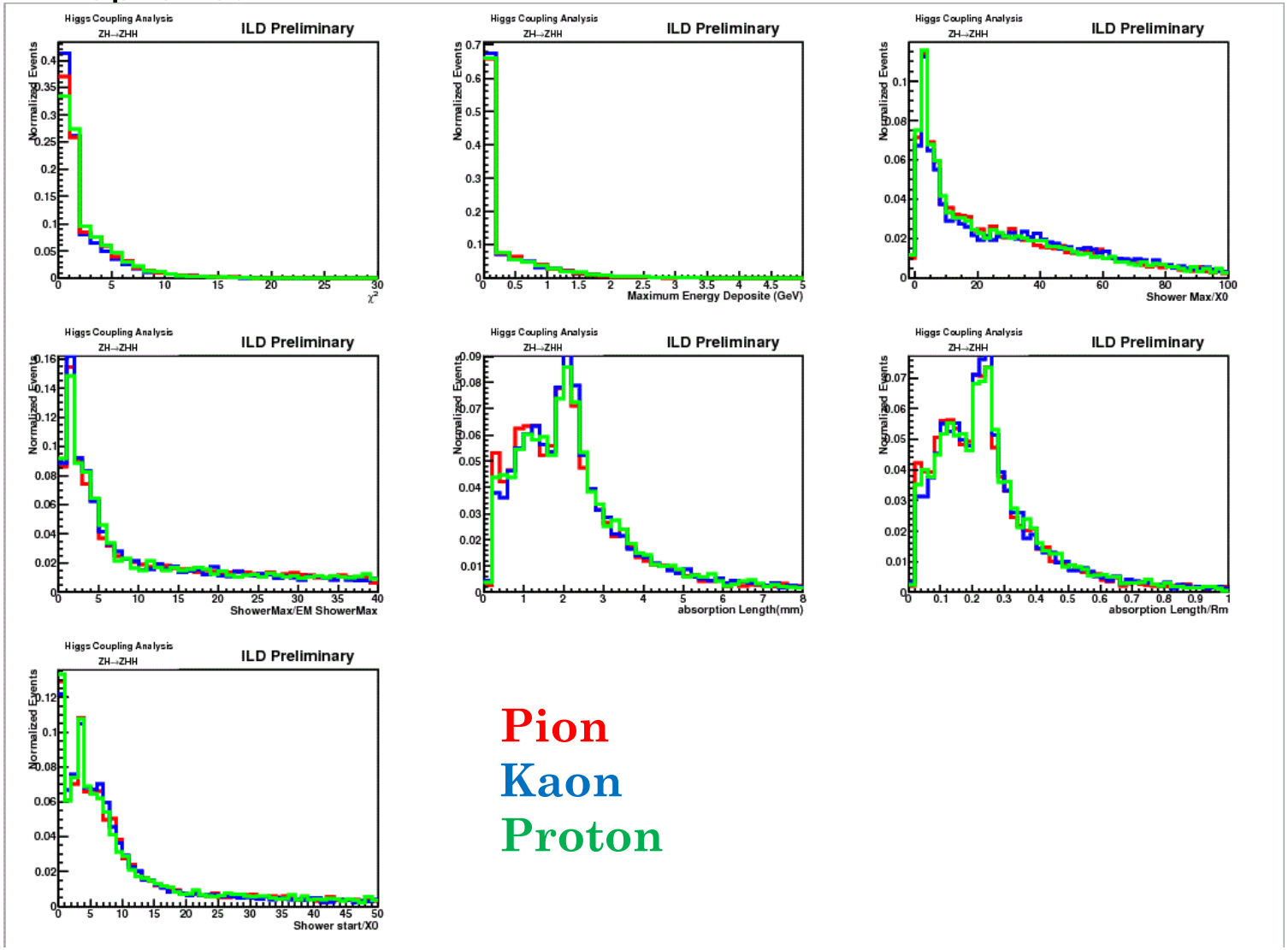
- Muon type(fit result)
  - Shower spreads wider, shower goes deeper, and fitting is better at lower energy.
  - Energy dependence is disappeared when scaled with expected shower max



E(lep)<20GeV
20GeV<E(lep)<40GeV
40GeV<E(lep)

Comparison of the particles

- Pion, kaon, and proton
  - No difference is found so far… just identify hadrons or leptons?

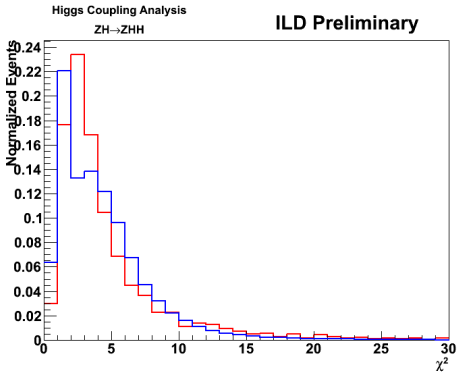


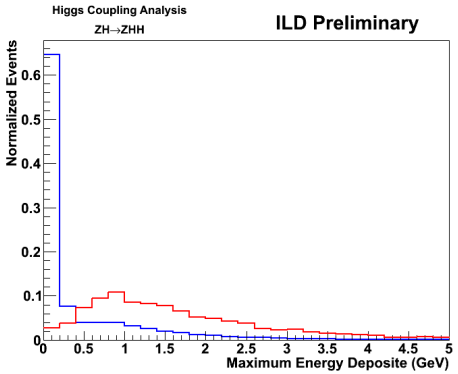
CONCERNS

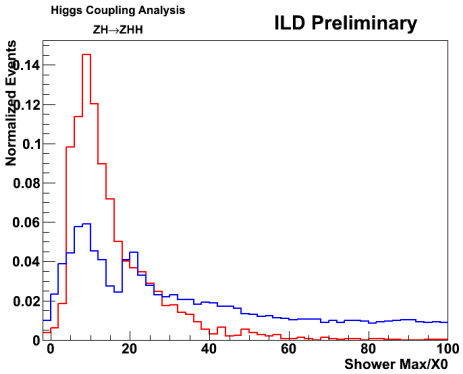
- As mentioned, need to learn Calorimeter configuration
- Good variables for lepton ID?
  - Will not good for cut based selection. MVA will be good
  - Can try soon
- Checking shower shape cluster-by-cluster

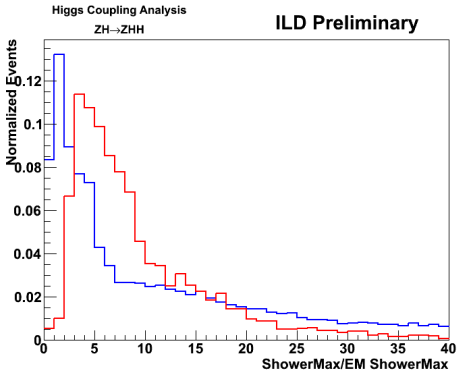
Energy dependence of shower profile

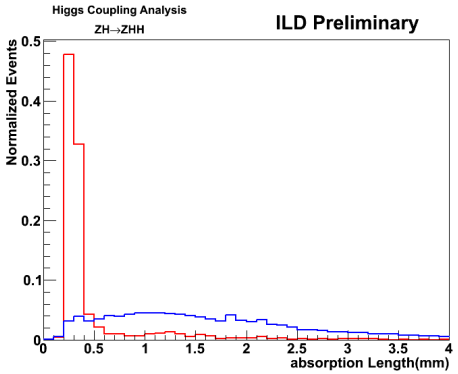
- Electron type

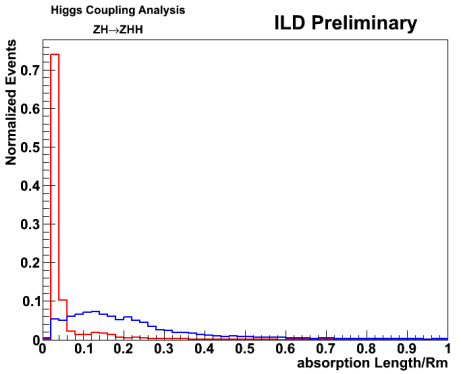


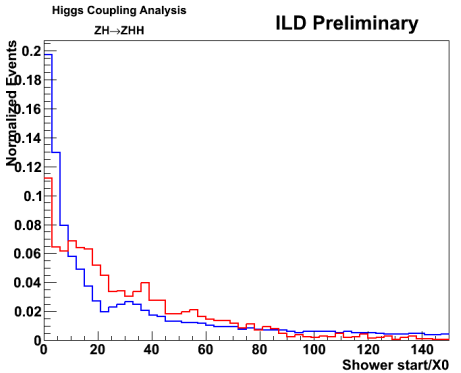












Isolated lepton
Soft&Fake lepton