
ILC Asian Physics & Software Meeting : 20 April (Mon.) 3:00pm JST

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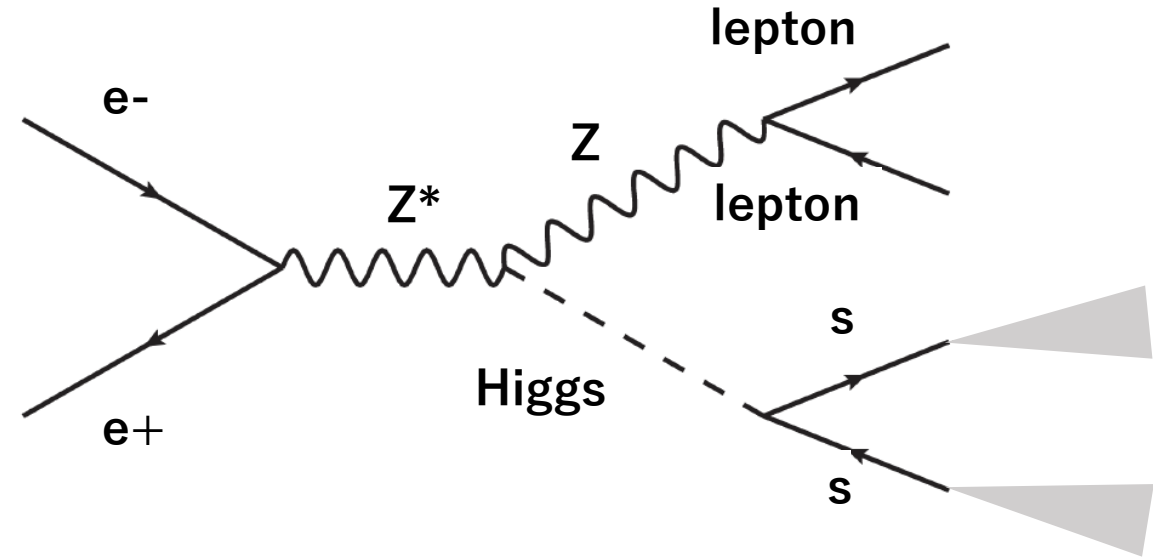


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Signal

■ $e^+e^- \rightarrow ZH$

- ✓ $Z \rightarrow$ decays into two leptons (muon)
- ✓ $H \rightarrow$ decays into an $s\bar{s}$ pair

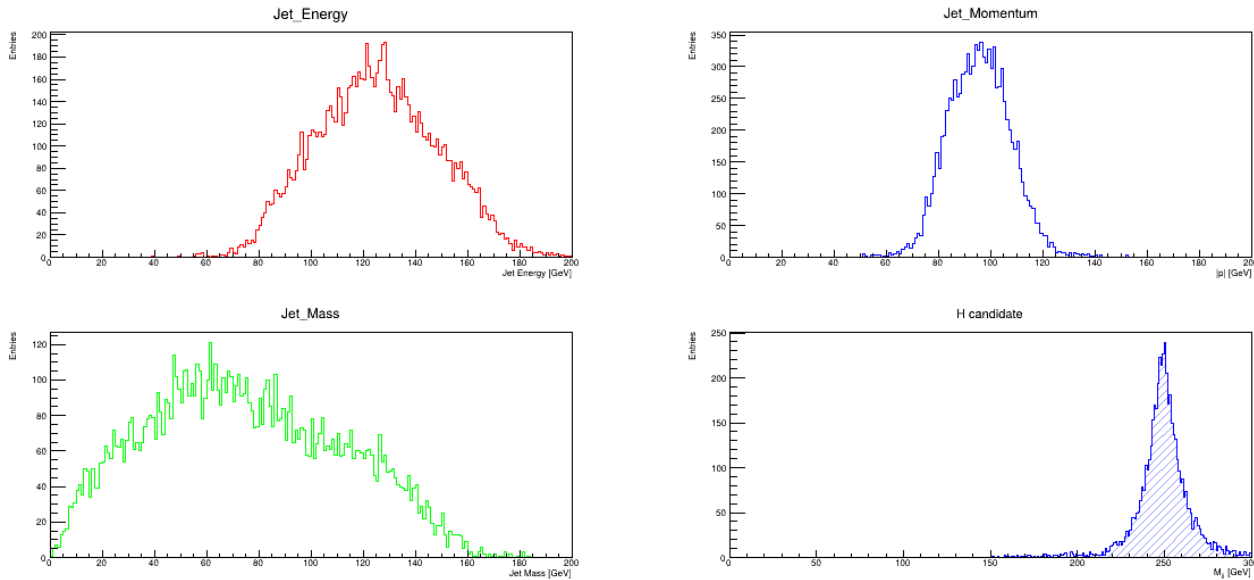


Reconstruction

- Record the energy and momentum of the jets produced by the decay of the s-quarks resulting from the Higgs decay
- Reconstruct the mass of the Higgs from these energy and momentum values

$$m^2 = E^2 - (P_x^2 + P_y^2 + P_z^2)$$

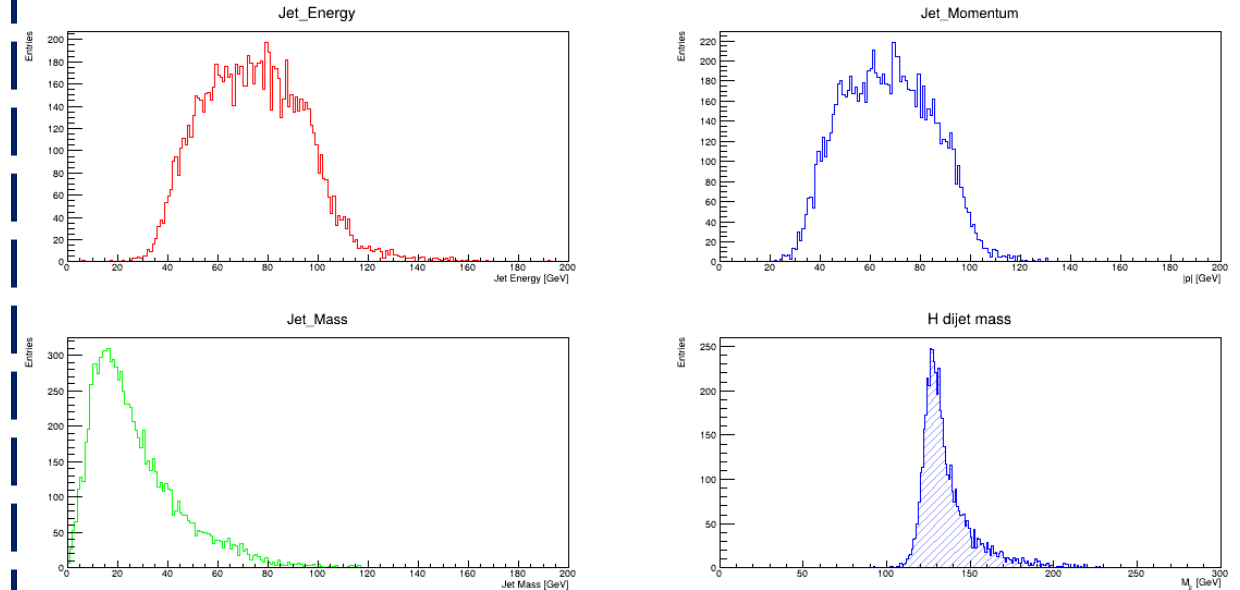
Without Isoleptontag



Mean values

H dijetmass : 249.36 GeV

With Isoleptontag

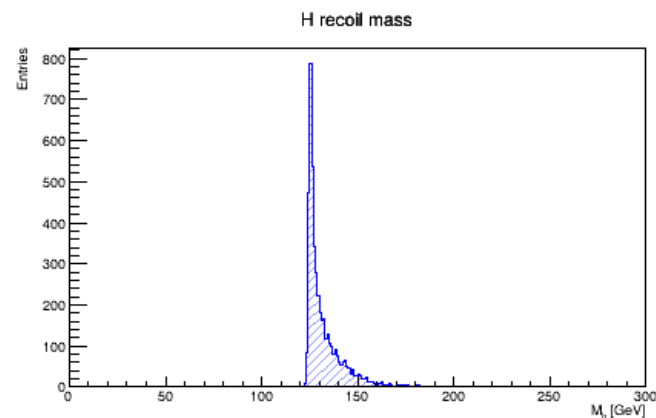
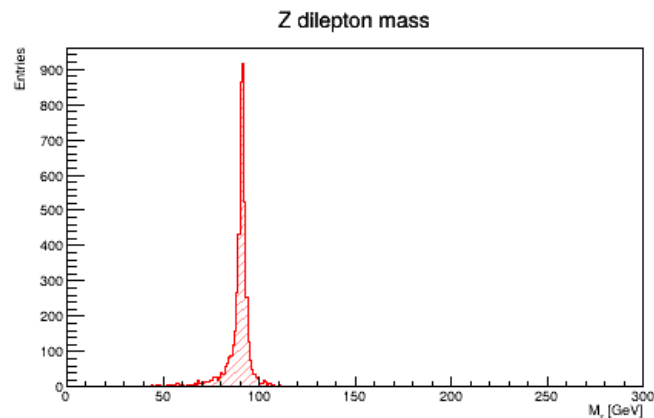
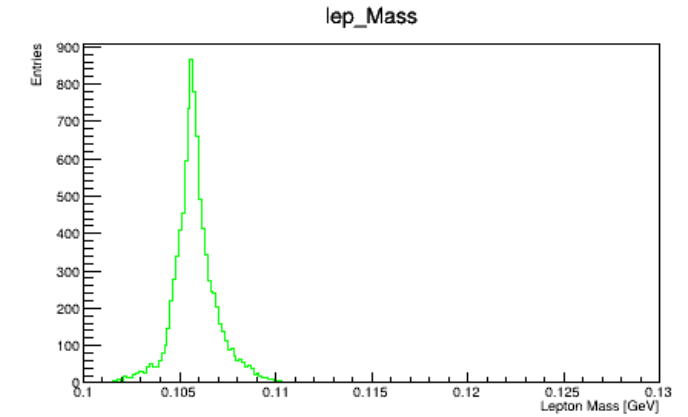
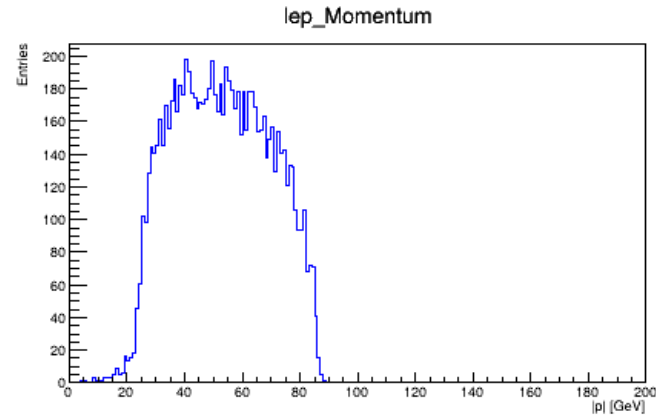
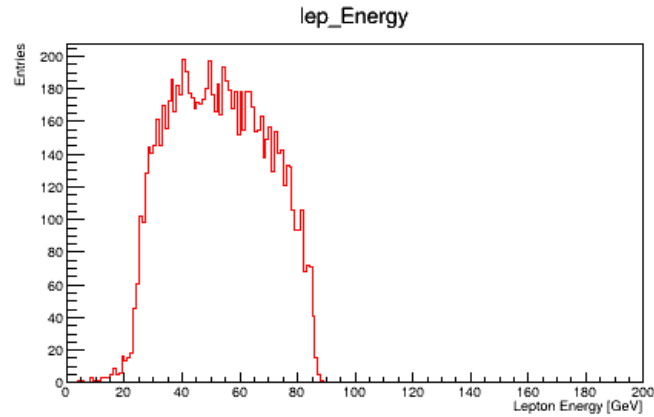


Mean values

H dijet mass(mean) : 136.25 GeV

H dijet mass(peak) : 126.50 GeV

Using isolepton tags, I separated the isoleptons from the jets and was able to reconstruct the H mass (dijet mass) from the jet information.



Z dilepton mass (mean) : 89.01 GeV
Z dilepton mass (peak) : 91.50 GeV

H recoil mass (mean) : 132.37 GeV
H recoil mass (peak) : 125.50 GeV

lepton mass (peak) : 105.63 MeV

- Reconstruct the mass of the Z boson by combining the masses of the isoleptons.
- Reconstruct the mass of the H boson based on the mass of the Z boson.
- Reconstruct the mass of a single lepton, and it matched the mass of the muon.

Next

✓ flavor tagging

Conventional method (BDT)

- Determine which parameters are used for the selection of heavy quarks such as B and c (secondary decay points, impact parameters) What is the precision of the S-selection?

Particle Transformer

- I'll follow the method Sugawara used and learn how to do it