

Compact Linear Collider

AKA CLIC

What's a CLIC?

- ▶ CLIC is a positron–electron collider that is proposed to be built underneath Geneva in the future.
- ▶ It will be $\sim 50\text{km}$ long and run at up to 3TeV



Well what good is that?

- ▶ A positron–electron collider is nice in comparison to a regular proton–proton collider because it's cleaner.



LHC

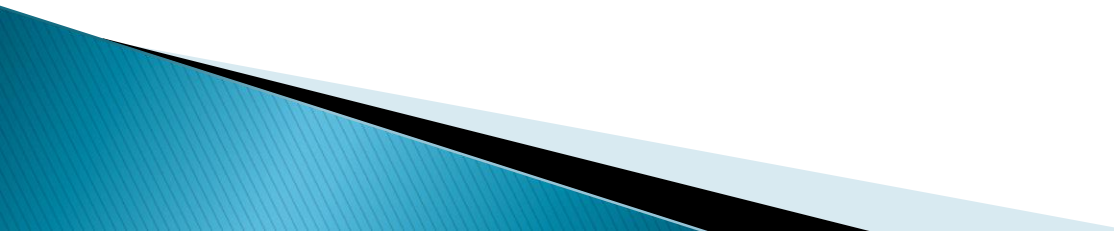


CLIC

What do you mean?

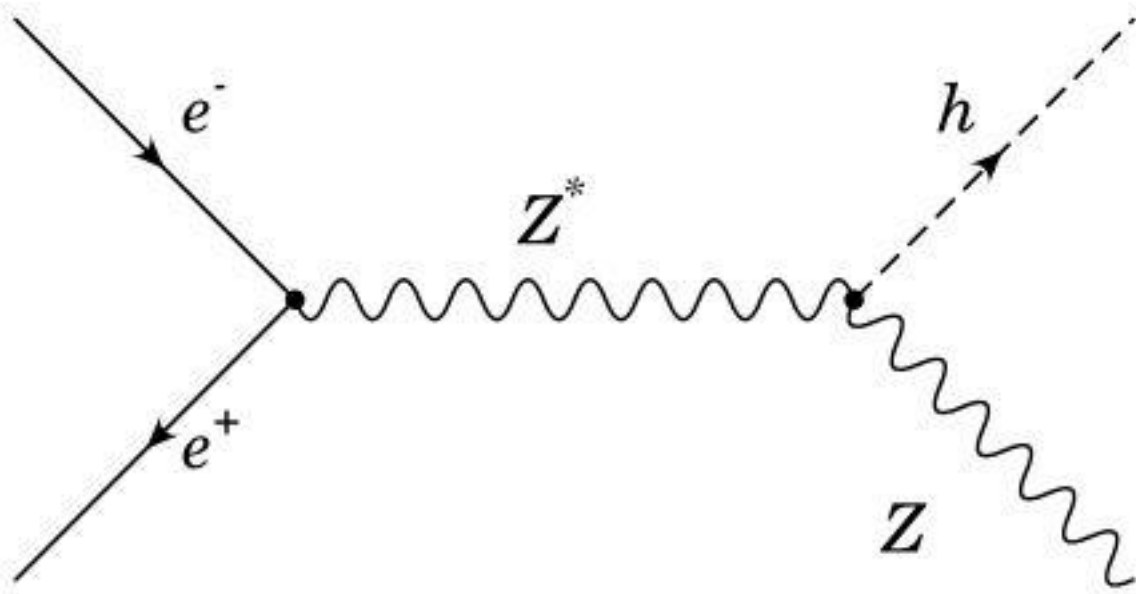
- ▶ Basically when proton's collide there is a huge nasty shower of all sorts of things.
- ▶ But when electrons and positrons collide there is relatively few resultant particles.
- ▶ So we can make more precise measurements.

Staged construction

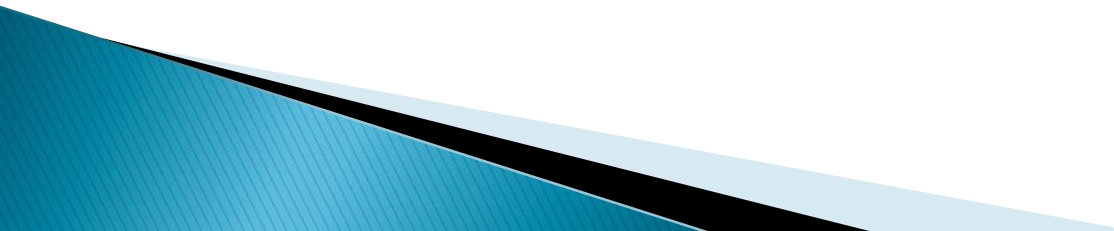
- ▶ One of the great things about building a straight collider is that we can use it before it's done!
 - ▶ The machine is planned to be turned on when it is the length required for ~ 1 TeV
 - ▶ **At this length we will start the measuring of the Higgs Strahlung cross section.**
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Higgs strahlung

- ▶ Just means Higgs radiation



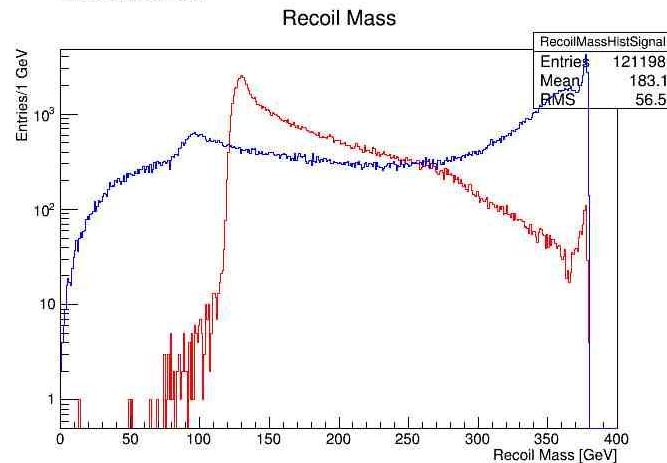
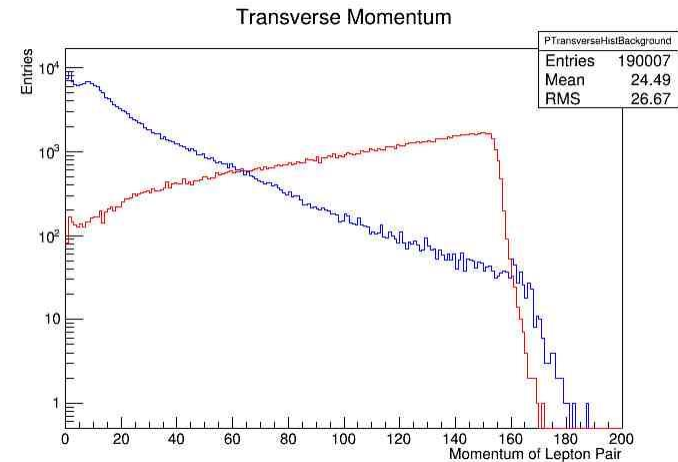
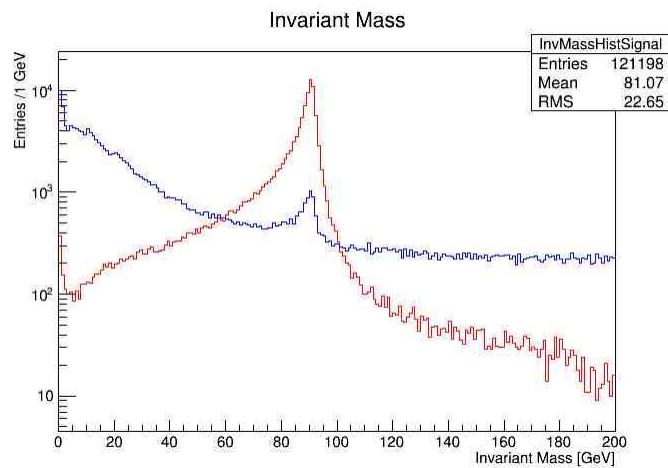
Our Project

- ▶ Basically our goal is to prepare for the upcoming measurements of the Higgs Strahlung at CLIC
 - ▶ Specifically we need to find which beam energy will provide the most precise measurements
 - ▶ We do this by simulating the events at different energies (250 GeV, 350 GeV, 380 GeV, 500 GeV)
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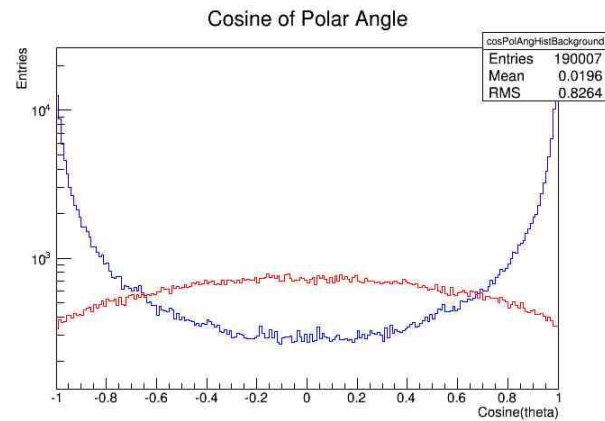
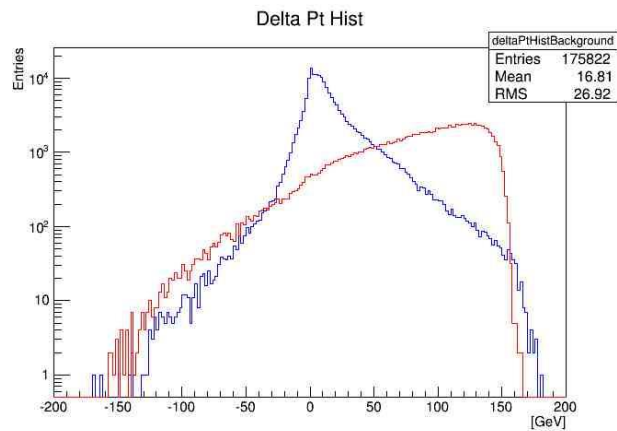
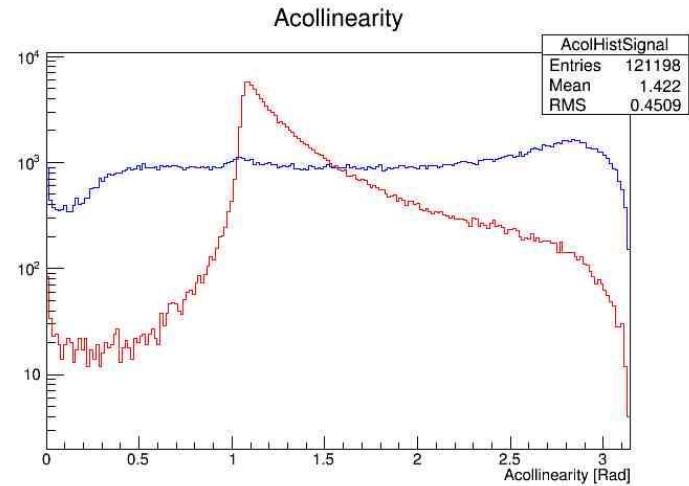
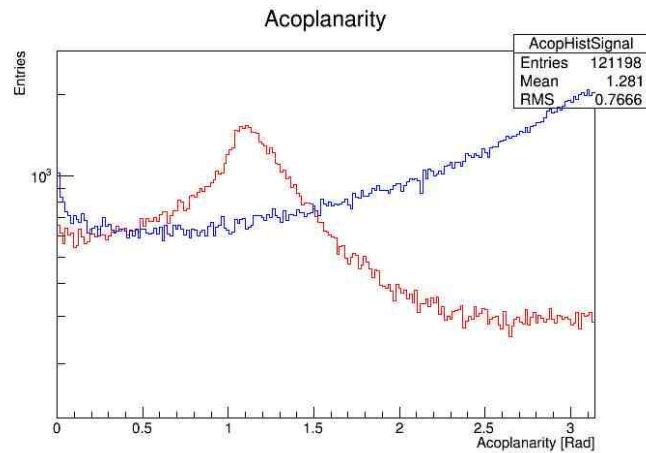
What we have done so far

- ▶ We have determined how to filter out background events from the desired Higgs Strahlung events so now we can measure the precision.

- ▶ We started by making these plots of generated Higgs events (red) and generated background events (blue)

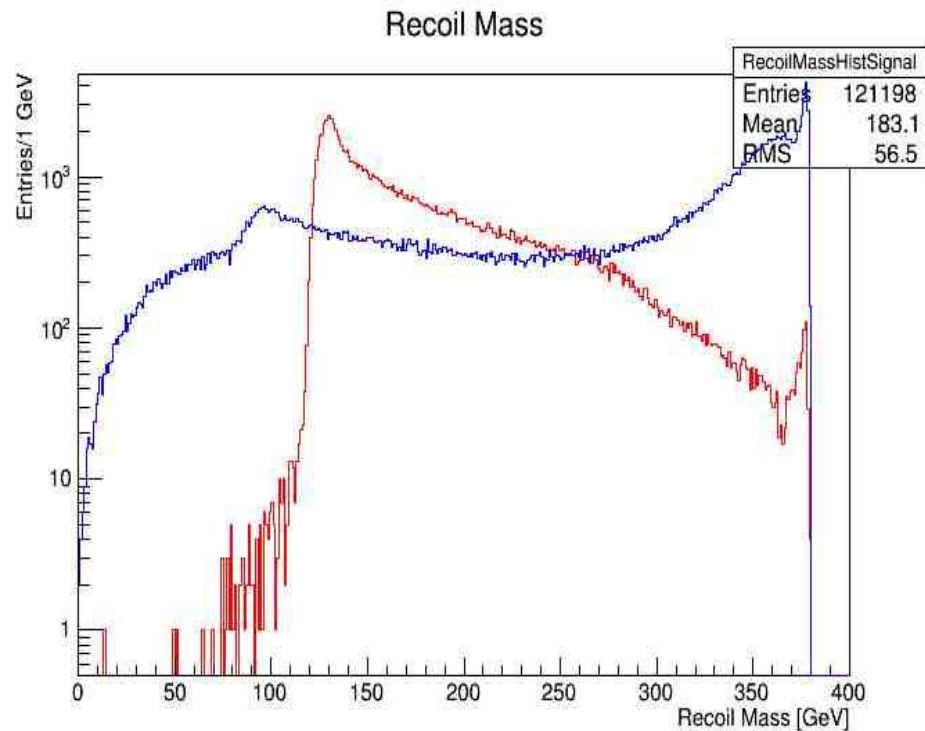


► More plots

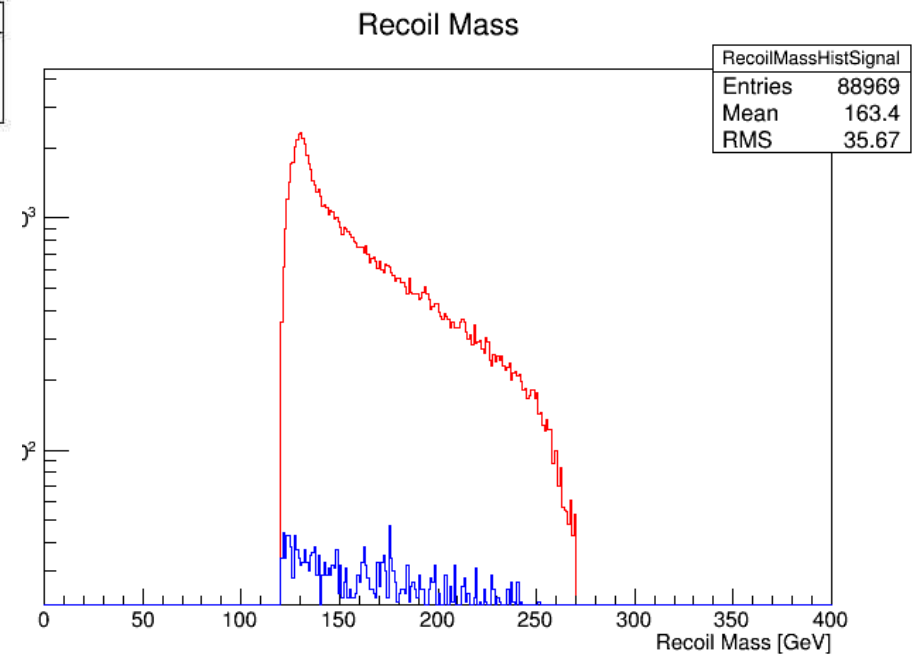


- And we were able to use these plot to determine the best way to filter out non-Higgs Strahlung events.

Before cuts



After Cuts



What's Next?

- ▶ We will perform some statistical hocus pocus to determine the precision with which we can measure the cross section at this energy