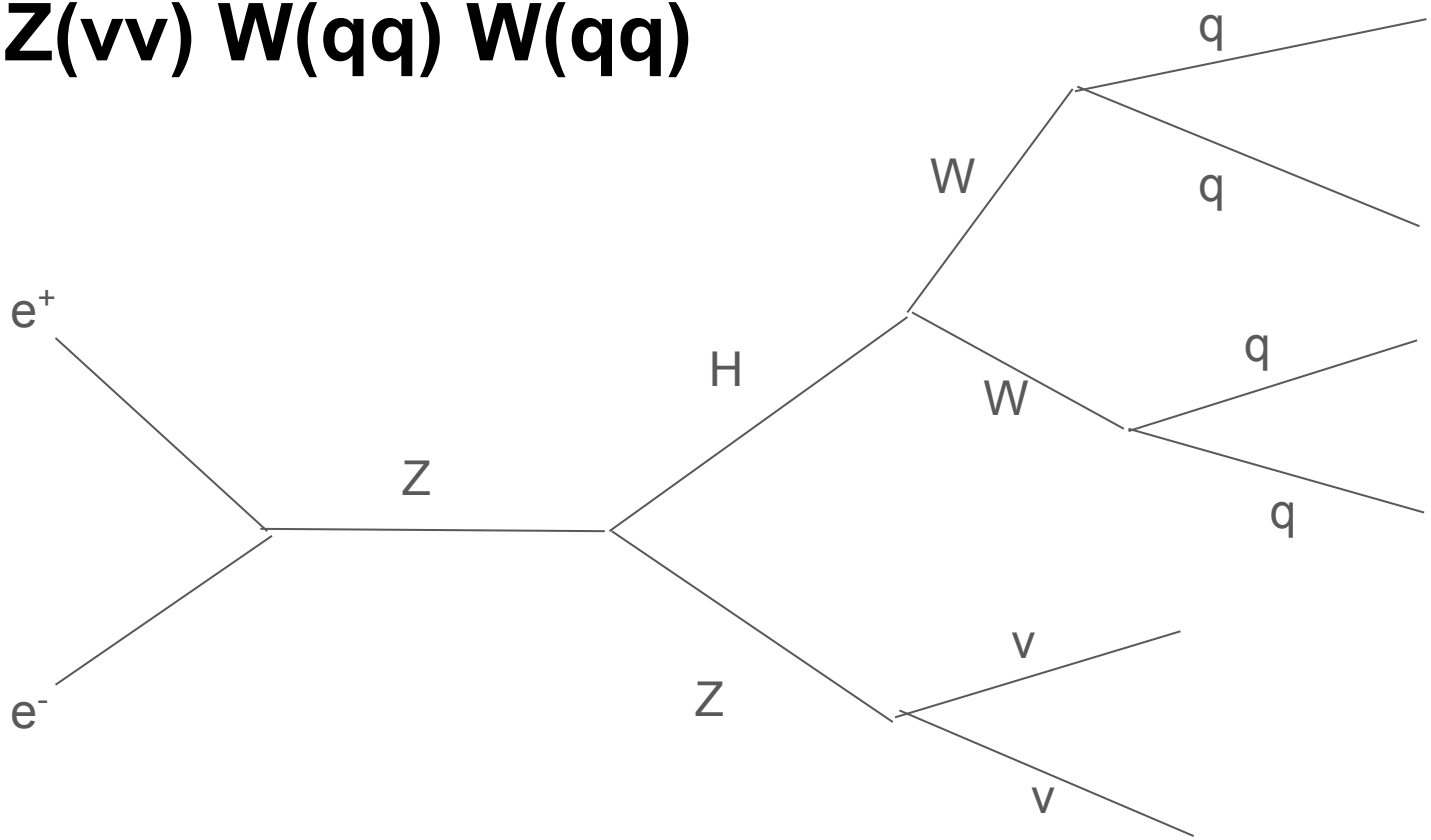
Higgs Decay

ZH -> Z(vv) W(qq) W(qq)

ZH -> Z(vv) W(qq) W(qq)

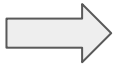


Cut 1: Eliminate all leptons

ZH -> Z(vv) W(qq) W(qq)

Possible Backgrounds:

- ZH -> Z(vv) W(lv) W(lv)
- ZH -> Z(ll) W(lv) W(lv)
- ZH -> Z(ll) W(lv) W(qq)
- ZH -> Z(ll) H(mumu)
- ZH -> Z(ll) H(qq)
- ZH -> Z(vv) H(qq)
- …

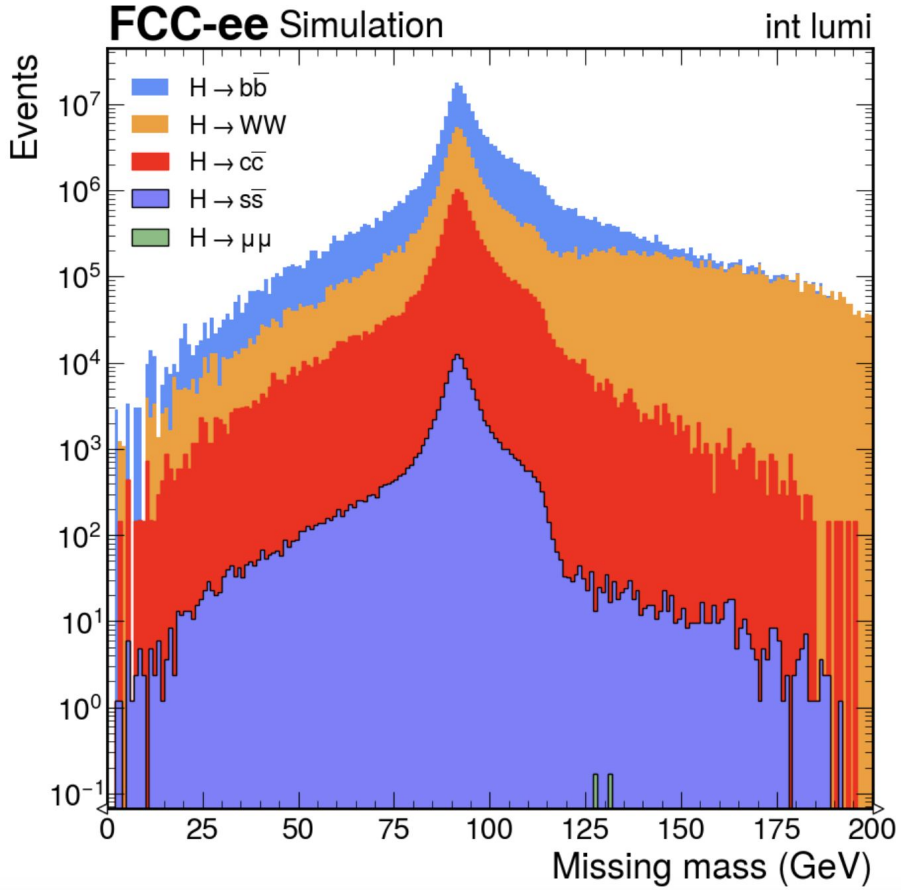


- ~~ZH -> Z(vv) W(lv) W(lv)~~
- ~~ZH -> Z(ll) W(lv) W(lv)~~
- ~~ZH -> Z(ll) W(lv) W(qq)~~
- ~~ZH -> Z(ll) H(mumu)~~
- ~~ZH -> Z(ll) H(qq)~~
- ZH -> Z(vv) H(qq)
- …

Cut 2: Missing Mass

ZH -> Z(vv) W(qq) W(qq)

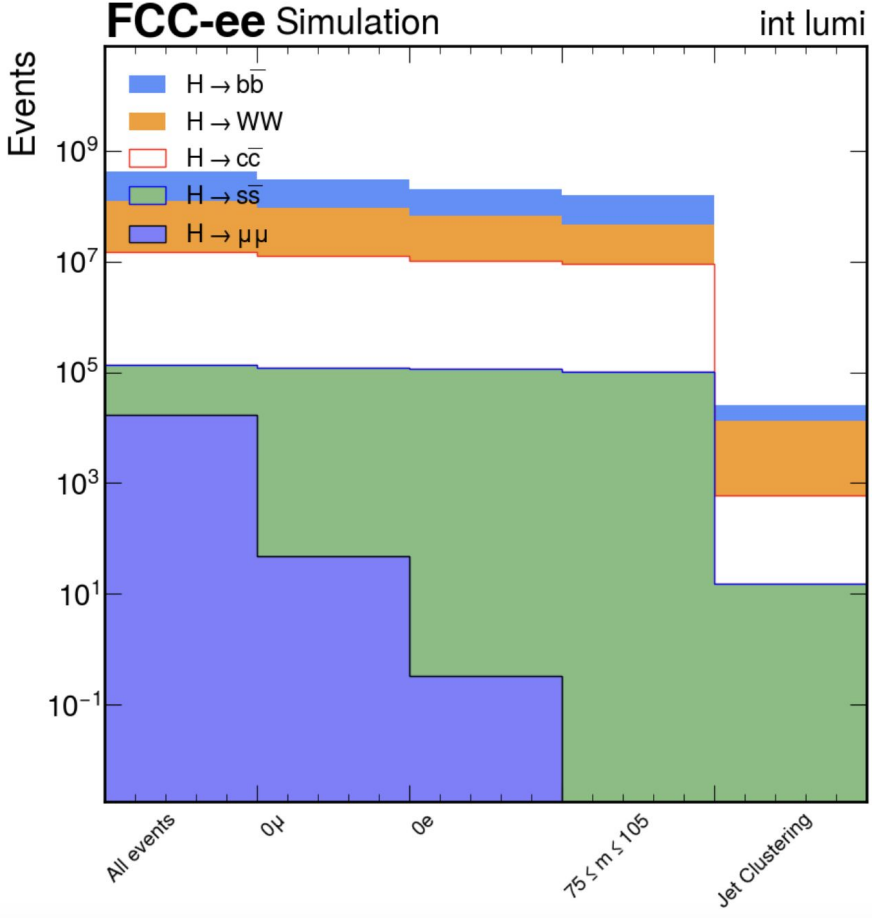
- Missing mass (neutrinos) should add to the Z mass (~ 90 GeV)
- Ensures Z -> vv
- Between 75 and 105 GeV



Cut 3: Jet Clustering

ZH -> Z(vv) W(qq) W(qq)

- Take all particles, cluster into 4 groups (jets)
- Find which quarks come from same W using energies



Possible Improvements

- Use impact parameter to eliminate H -> bb
- Consider angular distribution of jets
- Use other variables like momentum
- Split ZH -> Z (vv) WW dataset into different processes