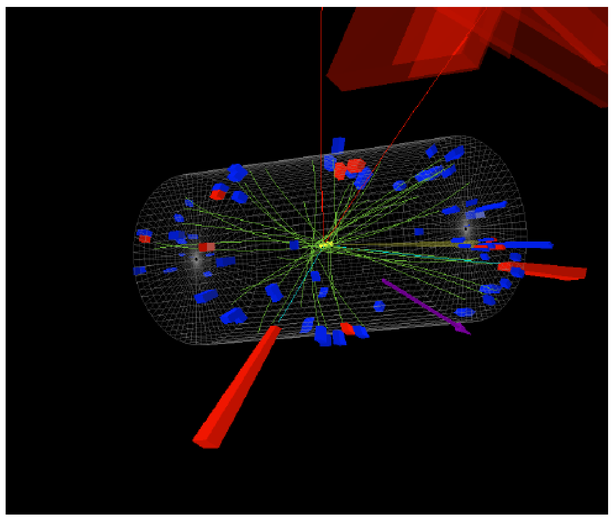
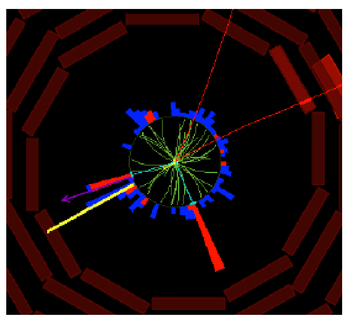
Our DESY experience

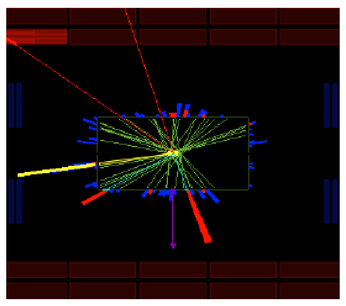
Scanning

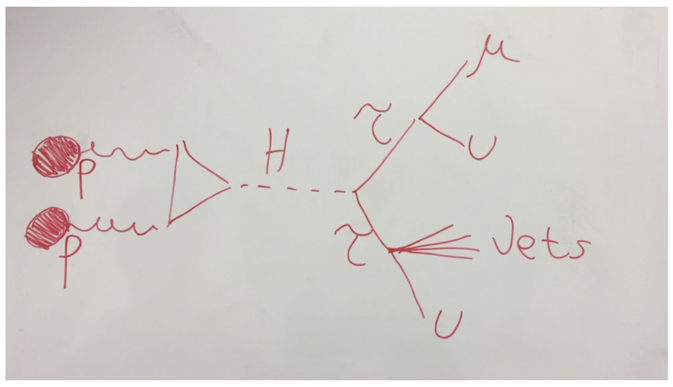
H→ZZ→2 electrons and 2 muons

M(Higgs candidate) = 124.71 GeV

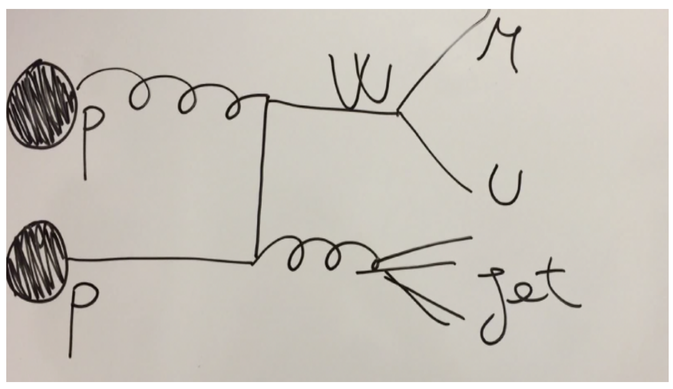






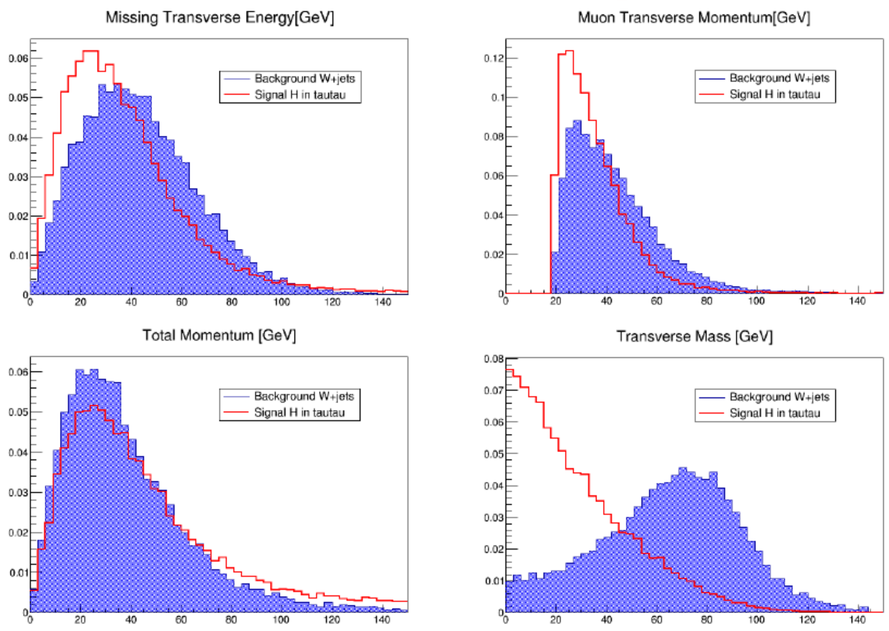


Here we have an Higgs decaying into two taus which then decay in a muon and neutrinos, and jets and neutrinos. The presence of neutrinos is visualized as MET. This events are called “signal” events.

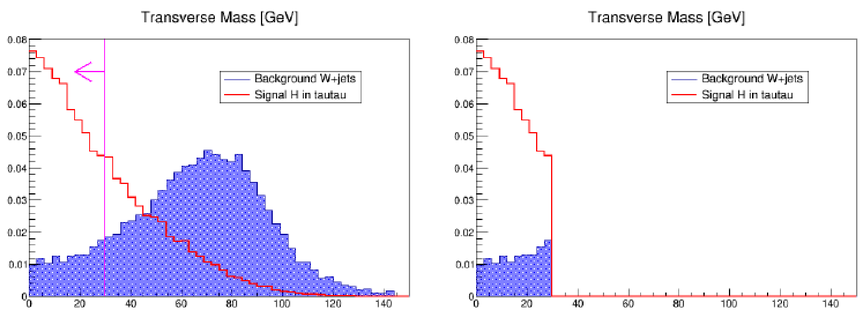


Herewe have two protons, colliding, produce a W boson, which decays in a muon and neutrinos, and jets. So, at the final stage this may seem the decaying of an Higgs boson, while it isn’t actually.

Variables Comparison



Transverse Mass Cut Optimization



Cut [GeV]	S / sqrt B	Efficiency	Rejection
<20	381	0.45	0.92
<30	399	0.60	0.87
<40	387	0.70	0.81

Signal Eff = $\frac{Nsignal\ after\ cuts}{Nsignal}$ **Back Rej** = $1-\frac{Nbackground\ after\ cuts}{Nbackground}$

Other Experiences