TTH Full Simulation Study Report

Ryo Yonamine (2011. 12. 2)

Isolated lepton finding

Two types of Electron ID and Muon ID

1. PID from pandra PFA

using “getType()” method

2. My PID (isolated lepton specific)

For e+/e-

(ECal_Energy + HCal_Energy)/P > 0.8) &&
(ECal_Energy / (ECal_Energy + HCal_Energy) > 0.9) &&
(ECal_Energy + HCal_Energy != 0) &&
(Charge != 0)

For mu+/mu-

(ECal_Energy + HCal_Energy)/P < 0.3) &&
(ECal_Energy / (ECal_Energy + HCal_Energy) < 0.5) &&
(ECal_Energy + HCal_Energy != 0) &&
(Charge != 0)

Efficiency：
of the particles that are recognized as isolated lepton candidates and are truly isolated leptons
divided by # of true isolated leptons

Purity：
of the particles that are recognized as isolated lepton candidates and are truly isolated leptons
divided by # of isolated lepton candidates

Pandora PFA PID case

	efficiency	purity
isolated electron	0.42	0.60
isolated muon	0.44	0.60
isolated electron/muon	0.43	0.60

My PID case

	efficiency	purity
isolated electron	0.84	0.59
isolated muon	0.92	0.59
isolated electron/muon	0.88	0.59

Why purity is so low ? (Plan)

Because
- e/mu from Higgs or tau can be recognized as the candidates.
- There are “W --> e/mu” processes in ttH samples.

H-->mu,nu will not be a problem because we will require H-->bb at later stage.

As for “W --> e/mu” processes (W do not have the parent.),

In order to understand this process I’m checking the MC information.

In order to reduce leptons from jets
--> Will add Do, Zo cut
and optimize the requirement for isolated lepton (cone energy vs energy plots)