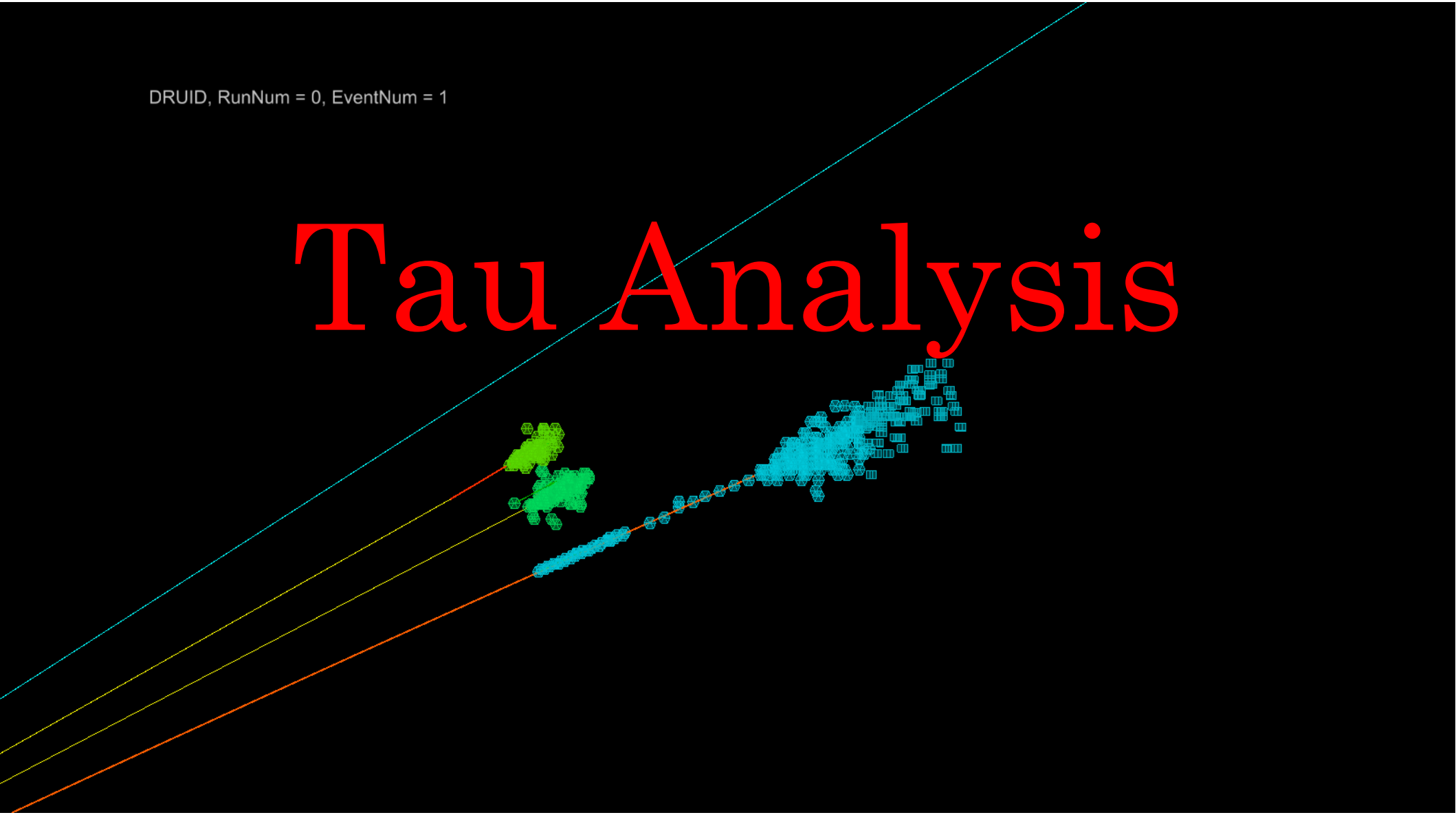


Tau Analysis

Introduction

- Motivation:
  - Test bed (Diagnosis) for any tau-tagging algorithm performance
  - Diagnosis for Arbor confusions

- Goal: Tau tagging algorithm for Br(H->Br(tautau)) study

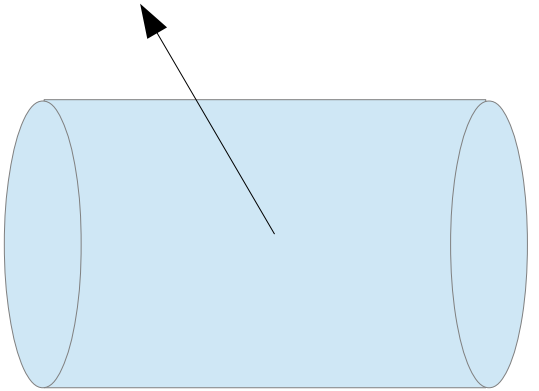
- Sample & Code:
  - Z->di tau at Z pole, 10k event (file: 001 - 010): /besfs/groups/higgs/data/SimReco/wo_BS/FlavorTag/CEPC_v1_zqq/RecData_150522/z_l0ta
  - Src code: ~manqi/Analysis/TauAnalysis

Algorithm

- Read Tau information from MCTruth
- Find all “visible” final state MC particles
  - (Z|VTX) < 1000 && (Perp|VTX) < 1500

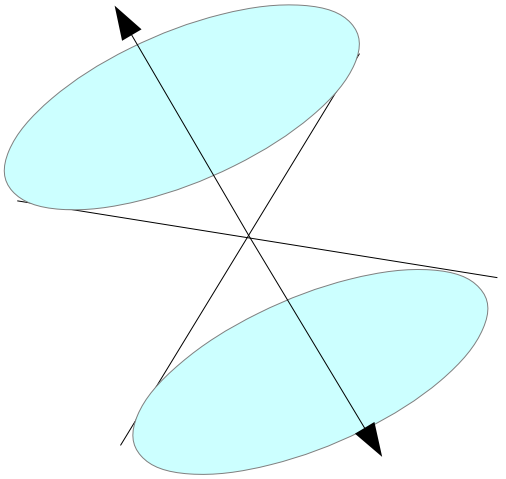
    &&
  - (Z|VTX) > 1000 || Perp|VTX > 1500
- Trace back to initial Tau.

  ==> MC Tau with all final visible states information



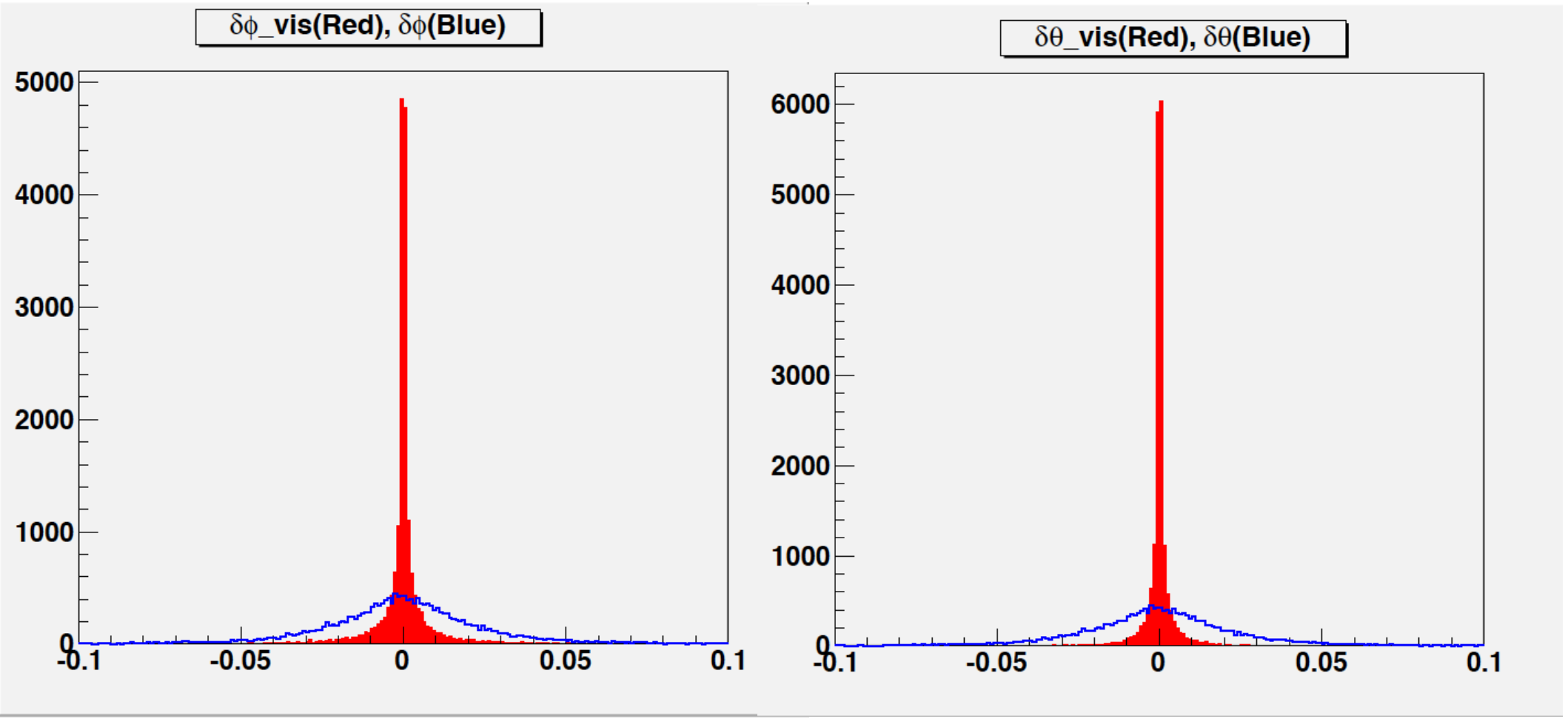
- PFO level: For each tau, assign any particle with angle < 1 to the tau jet.

  ==> Reco Tau with all final states information

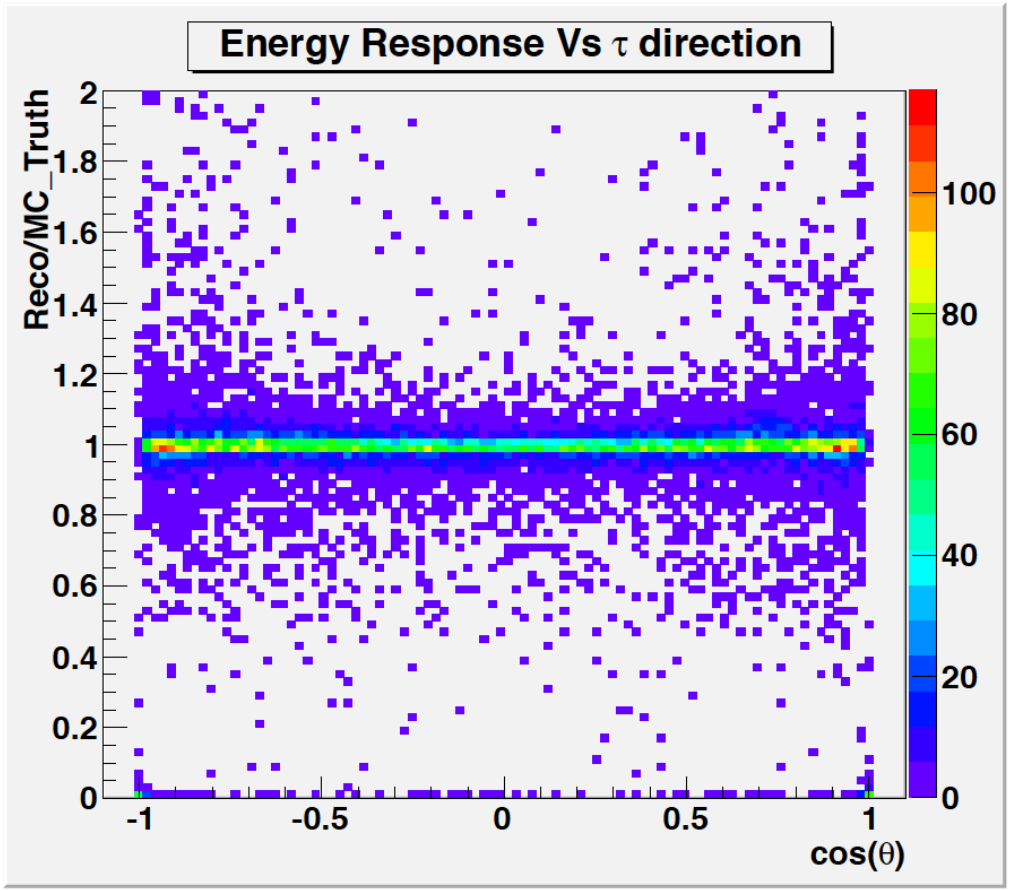


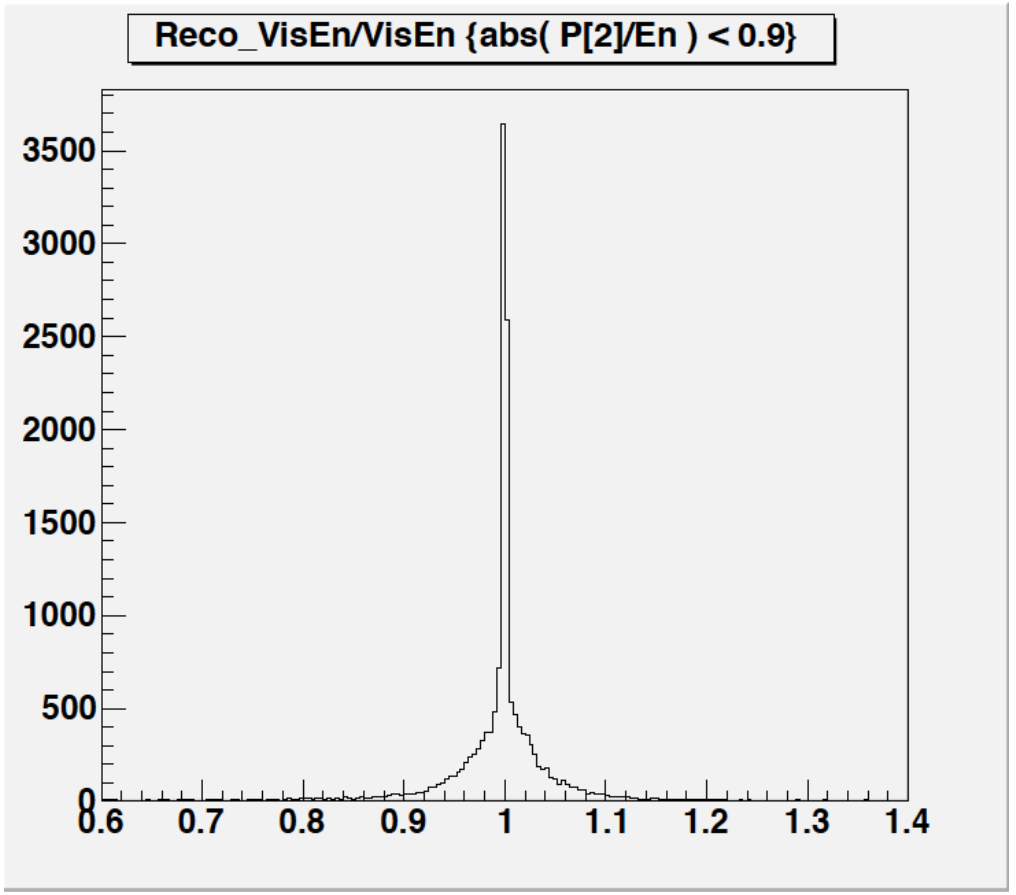
- *Remark: this naive match need to be replaced with ANY tau tagging algorithm*

Tau - Direction



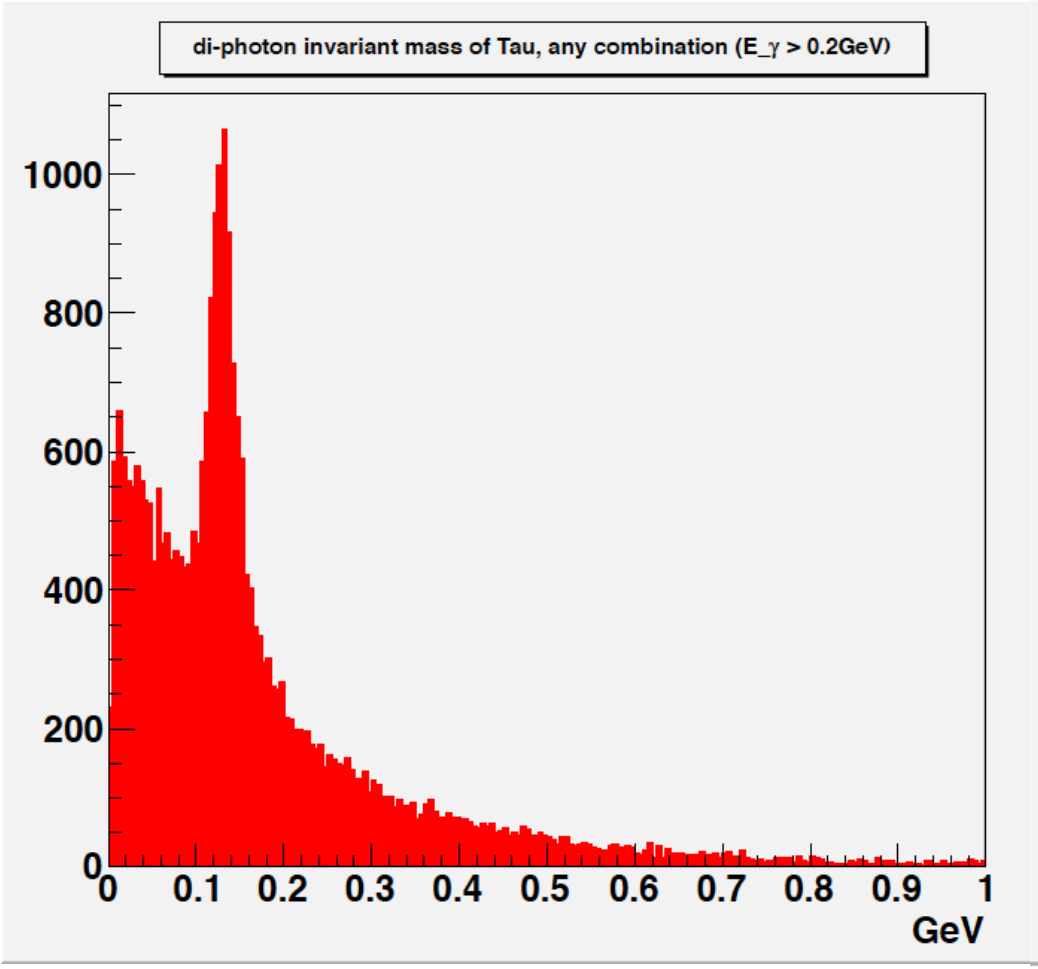
Energy

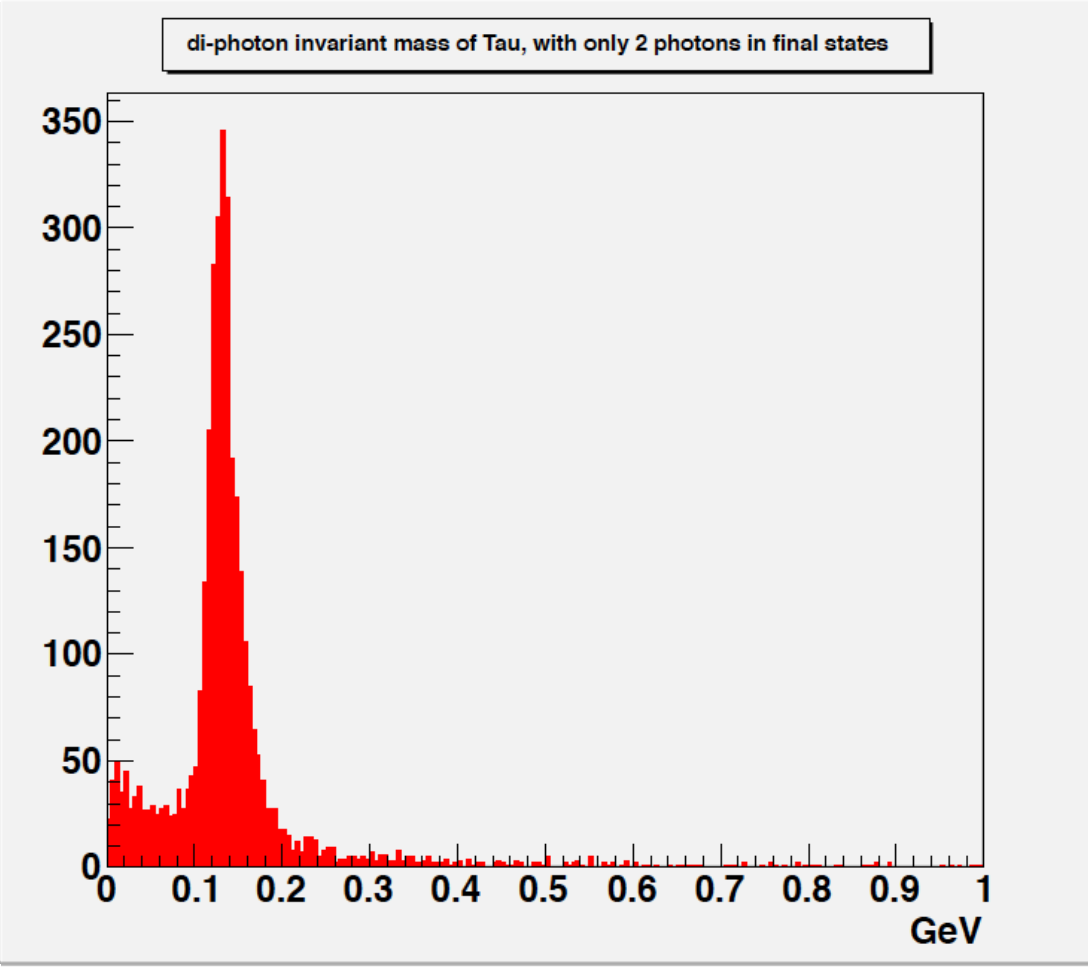




Off peak event in fiducial region: what are they?

Di-photon invariant mass



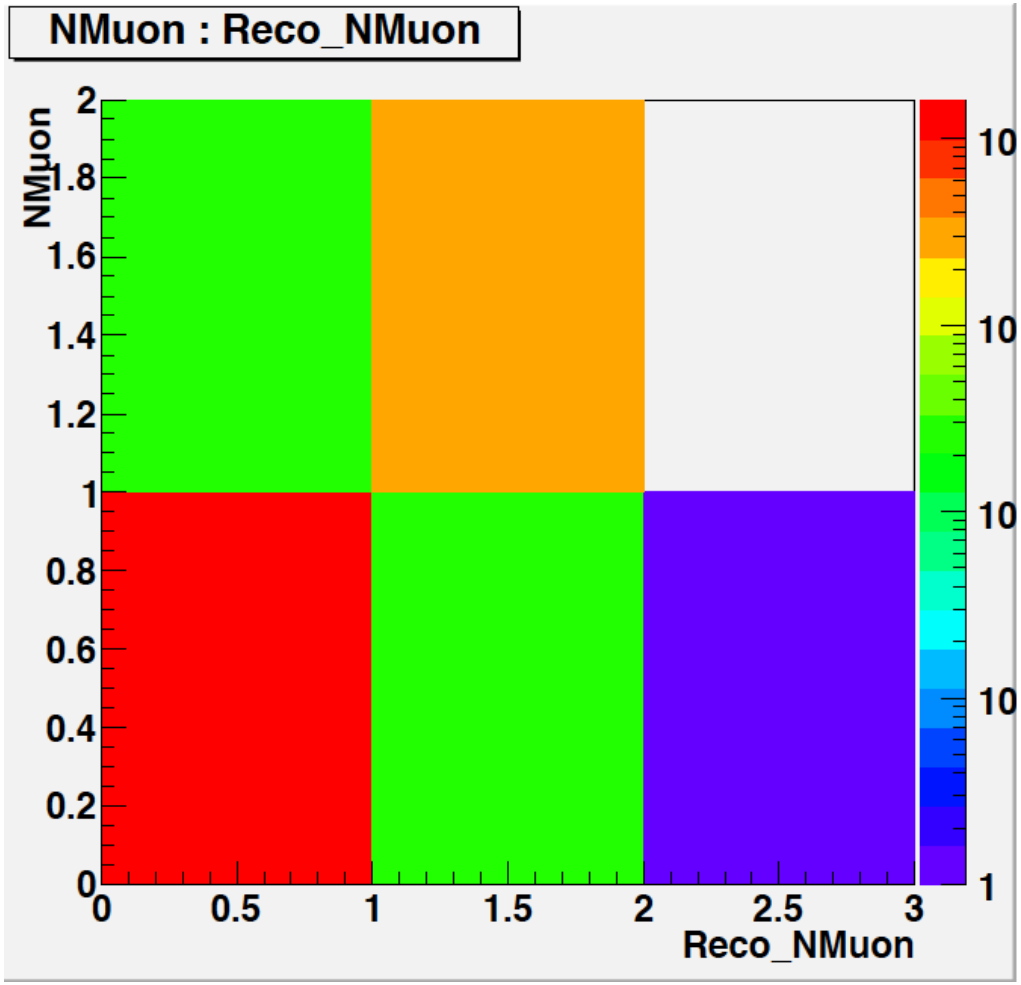


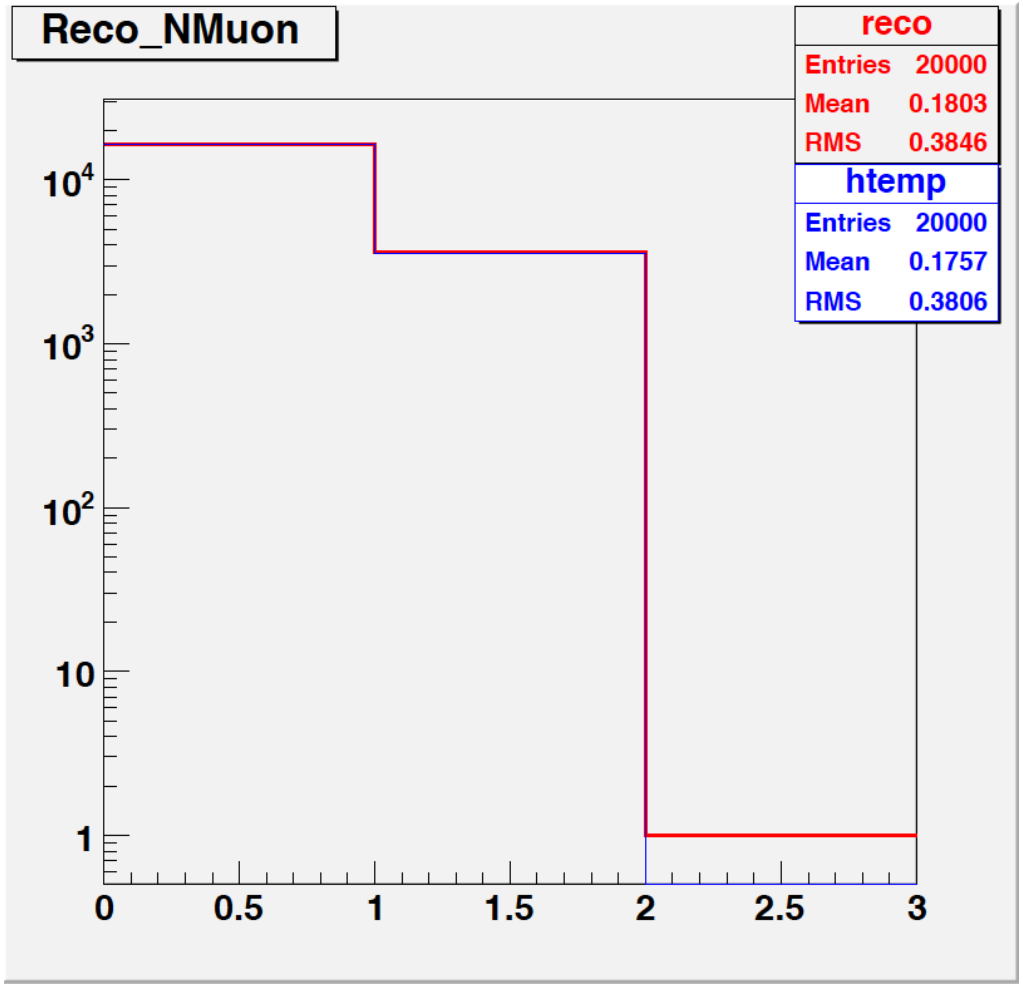
Photon direction resolution can be significantly improved
Using bayoncenter instead of seed position...

Object finding:

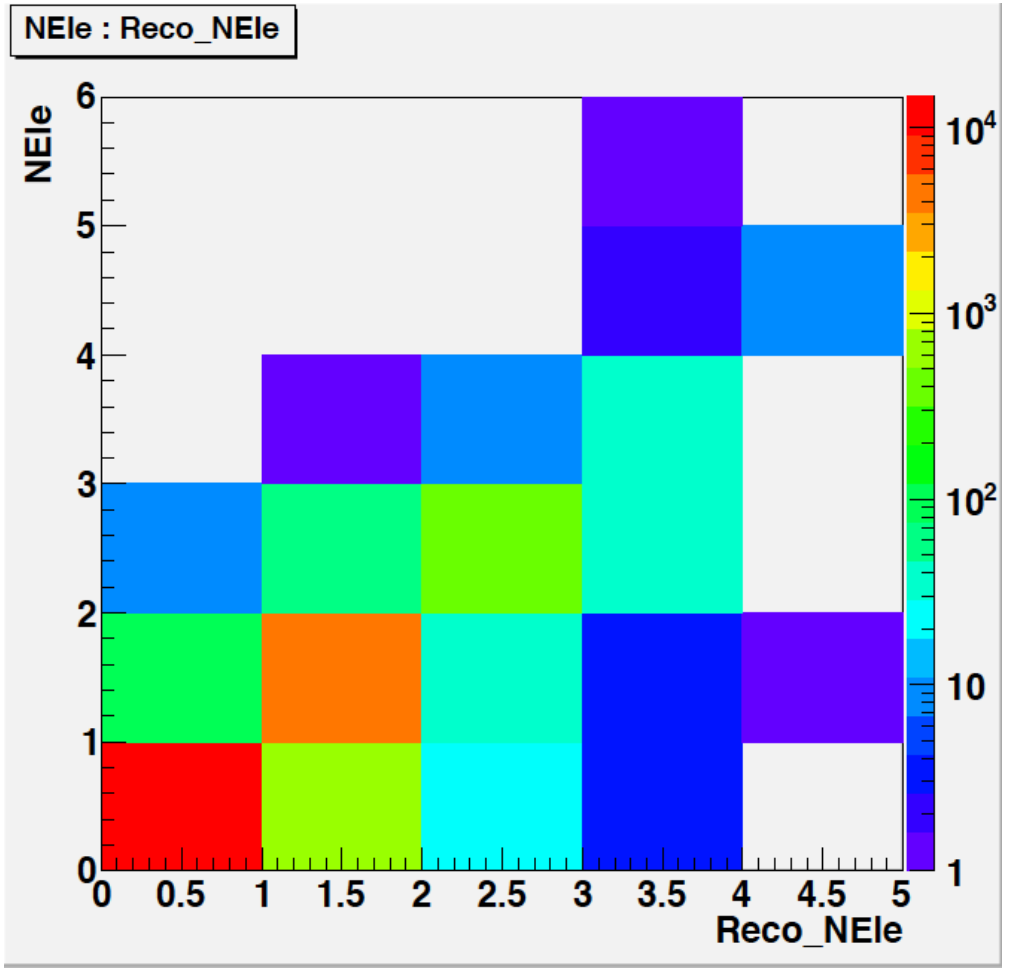
- Compare the number of
  - Pion, Muon, Electron with En > 1 GeV;
  - Photons
- Goal: 1 – 1 correspondence..

Nobject: muons

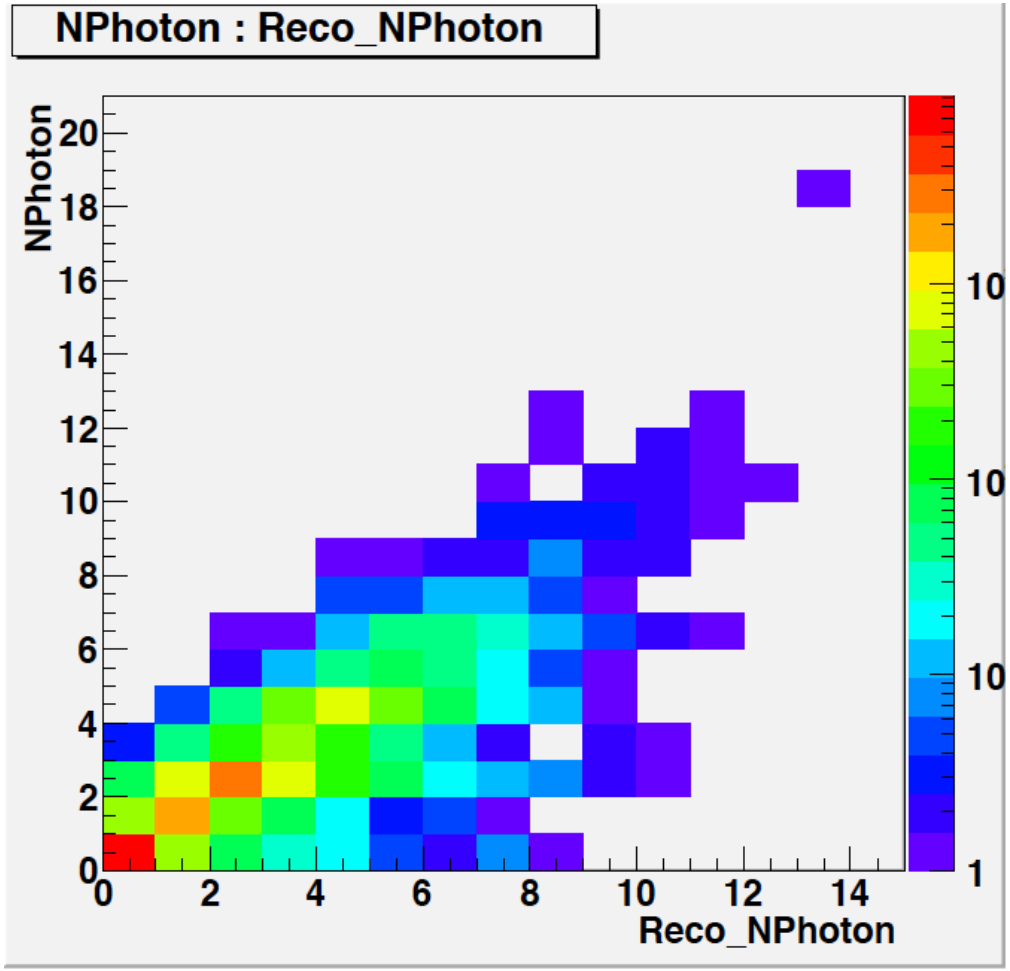


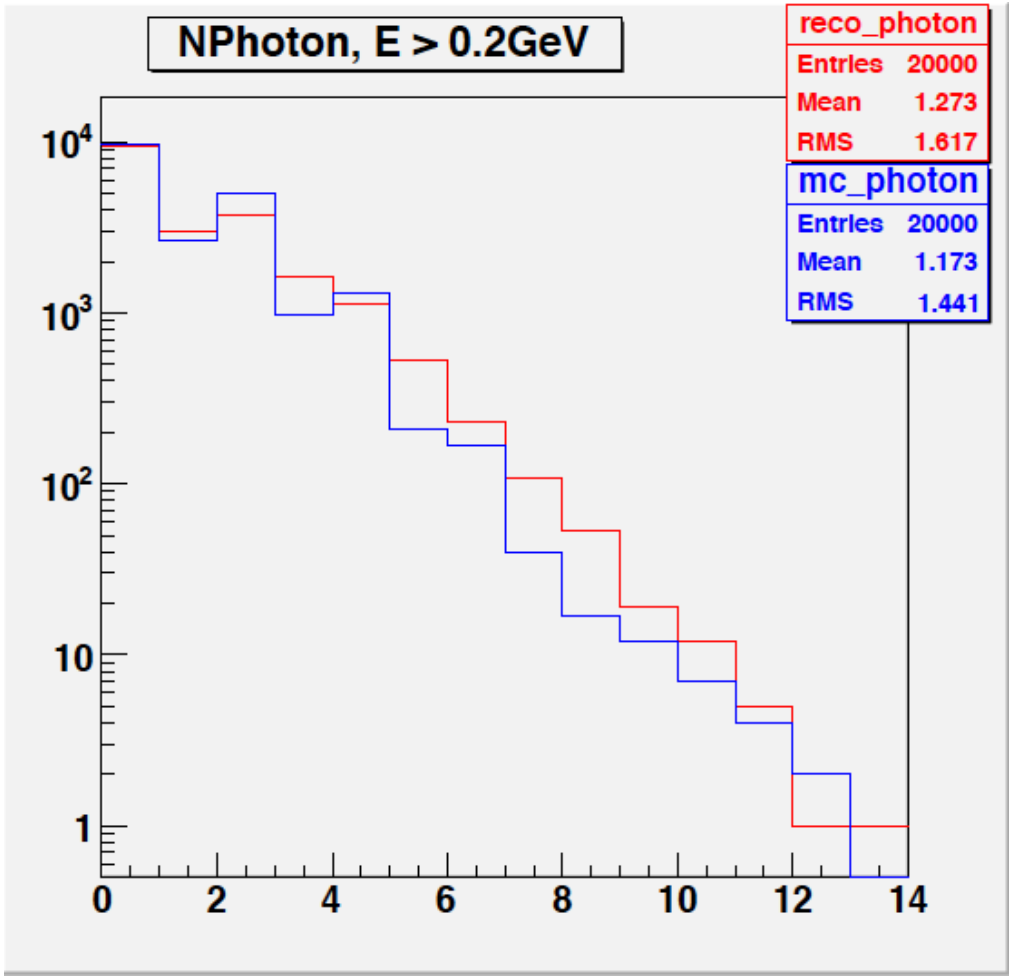


Electron/Positrons



Nobject: photons





Nobject: pion(reco)