Quick report on top efforts

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Outline

- First part: A brief look at the electron ID variables and comparing the results with QCD
- Second part: Looking at different electron properties in TopTree and trying to correct the isolation variables
- Third part: Ongoing tasks …

Part I: Introduction

- The goal:
  - A simple check to see if the current cuts on eId variables, are good enough to reject the QCD background
- Signal is SemiElectronic ttbar:
  - /TTbar/Summer09-MC_31X_V3-v1/GEN-SIM-RECO (skimmed to signal decay channel using genInfo)
- Background sample:
  - /QCD_EMEnriched_Pt30to80/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
- The currently used variables in eId Cut-Based and their cut values :

	H/E		$\sigma_{i\eta i\eta}$		$\Delta\eta_{in}$		$\Delta\phi_{in}$	
	Barrel	EndCap	Barrel	EndCap	Barrel	EndCap	Barrel	EndCap
robustTight	0.01	0.01	0.0099	0.028	0.004	0.0066	0.025	0.020
robustLoose	0.075	0.083	0.0132	0.027	0.077	0.01	0.058	0.042

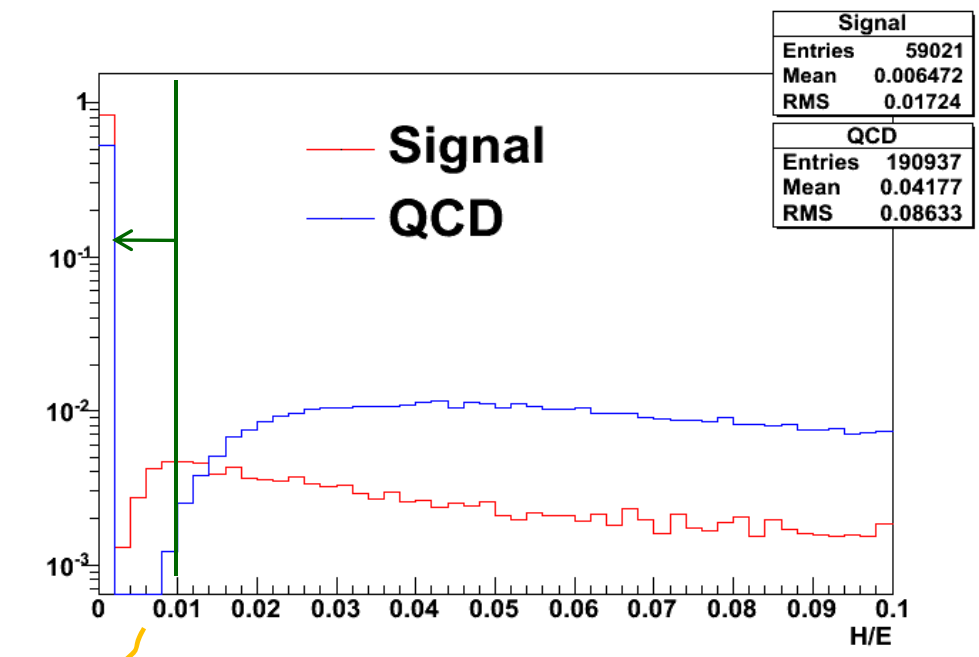
- The isolation variables (definitions/cut values):

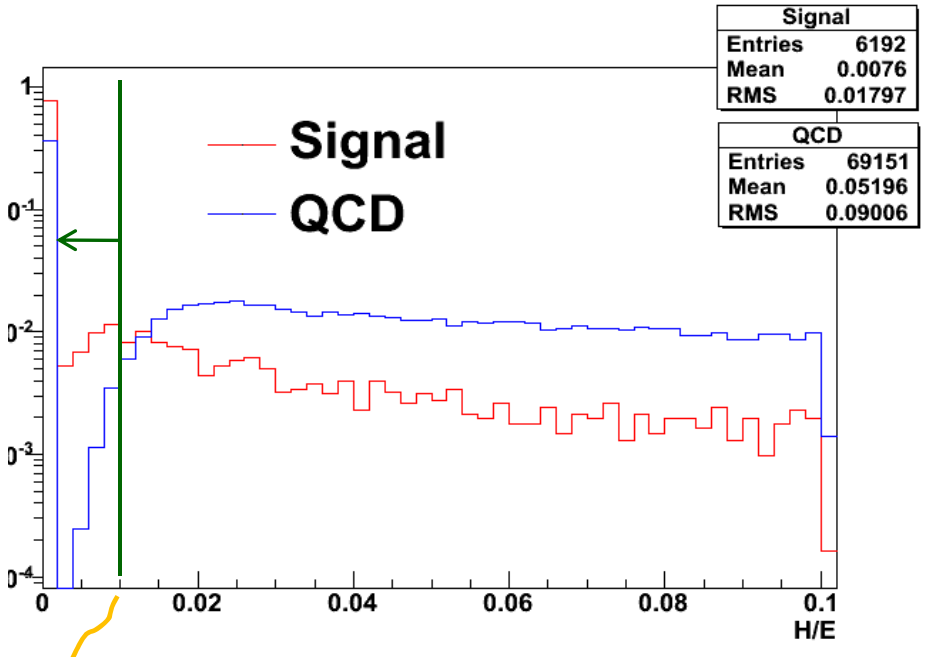
Combined relative isolation (trk+calo)/et	
Trk cone: 0.3, Calo cone: 0.4	0.1
All cones: 0.3	0.1

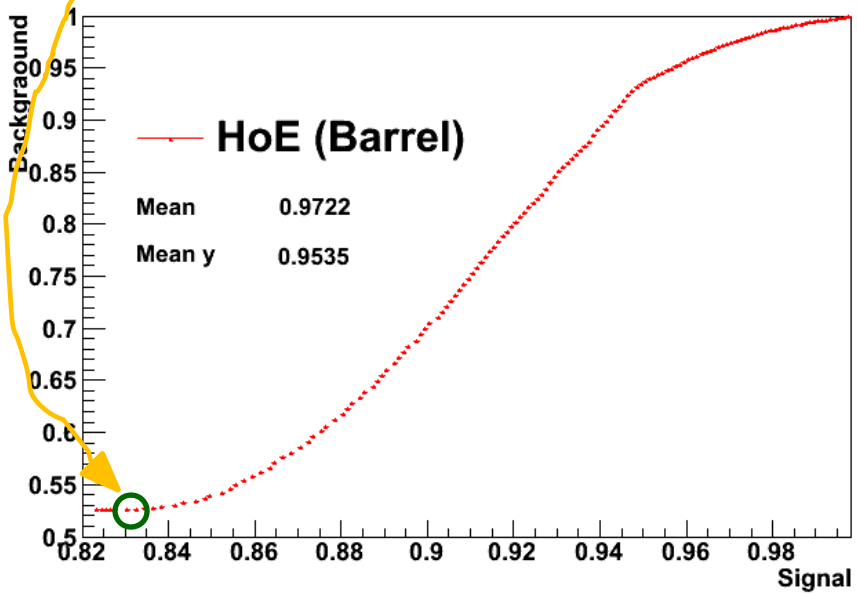
robustLoose criteria are almost nothing.

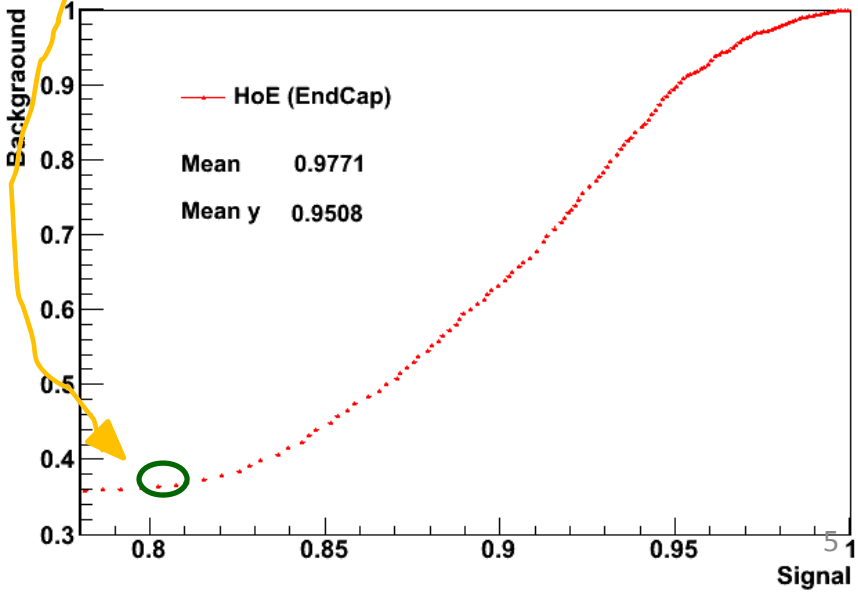
So, in the consequent pages, the **robustTight** criteria are studied

Part I: Id variables (H/E)

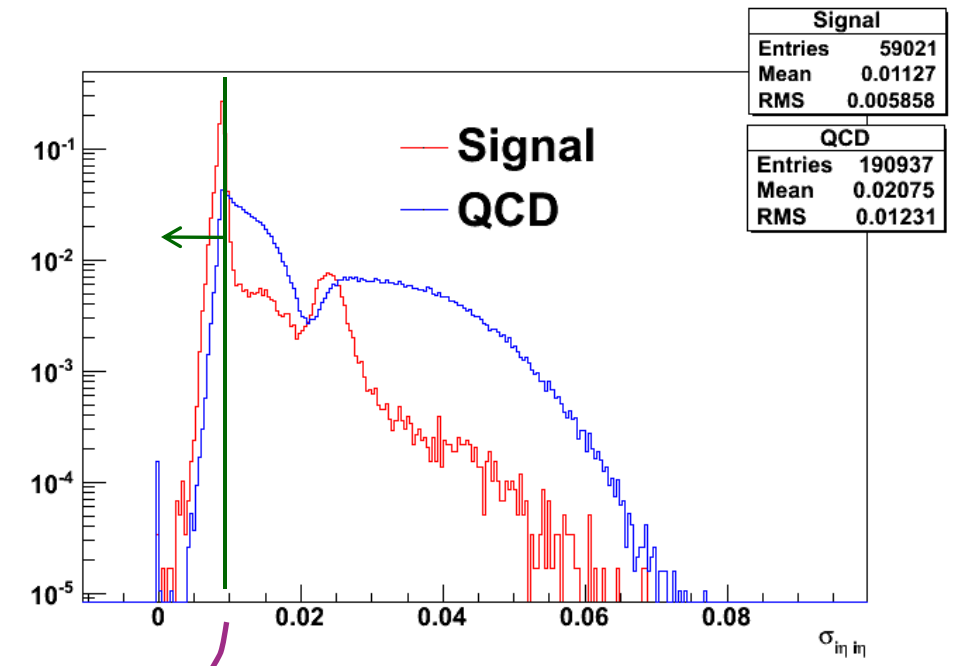


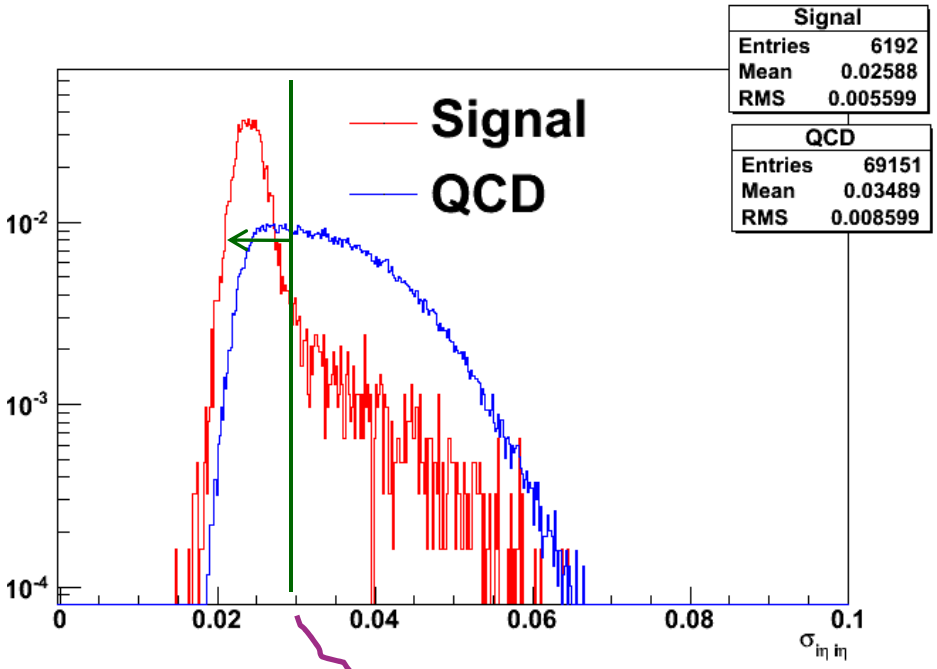


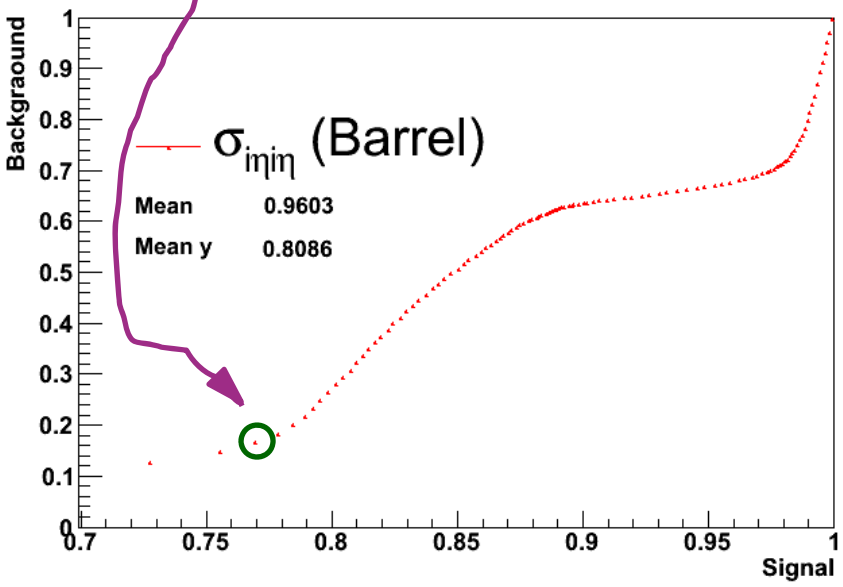


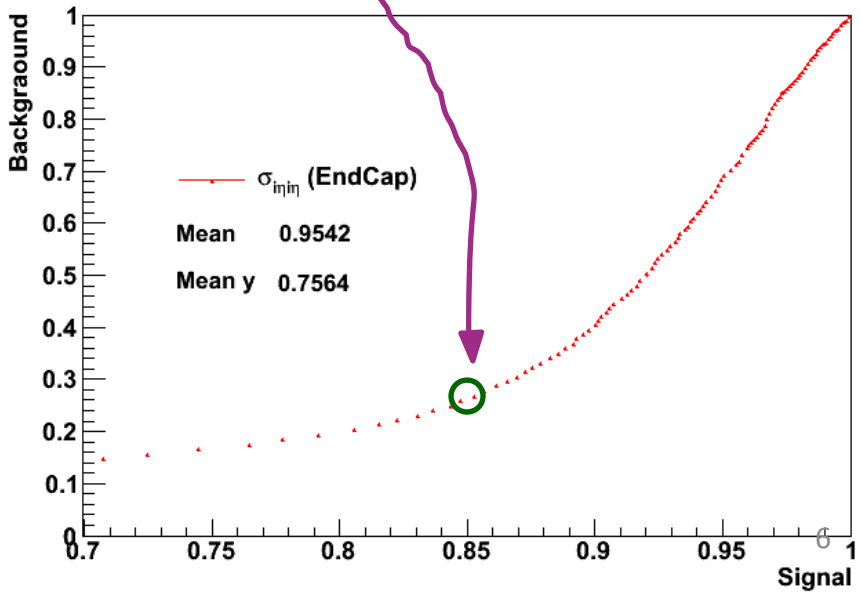


Part I: Id variables ($\sigma_{i\eta i\eta}$)

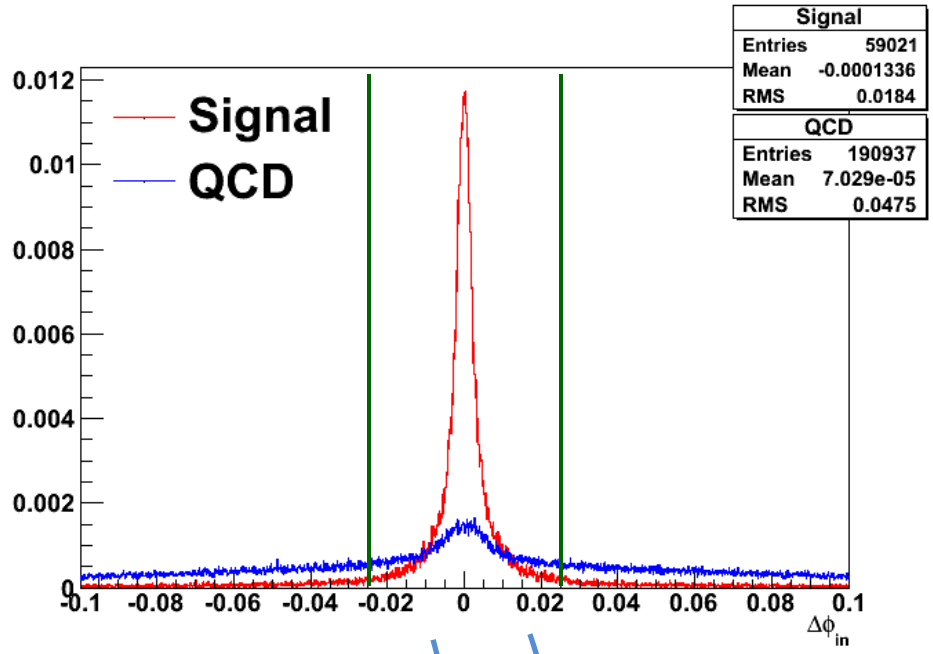


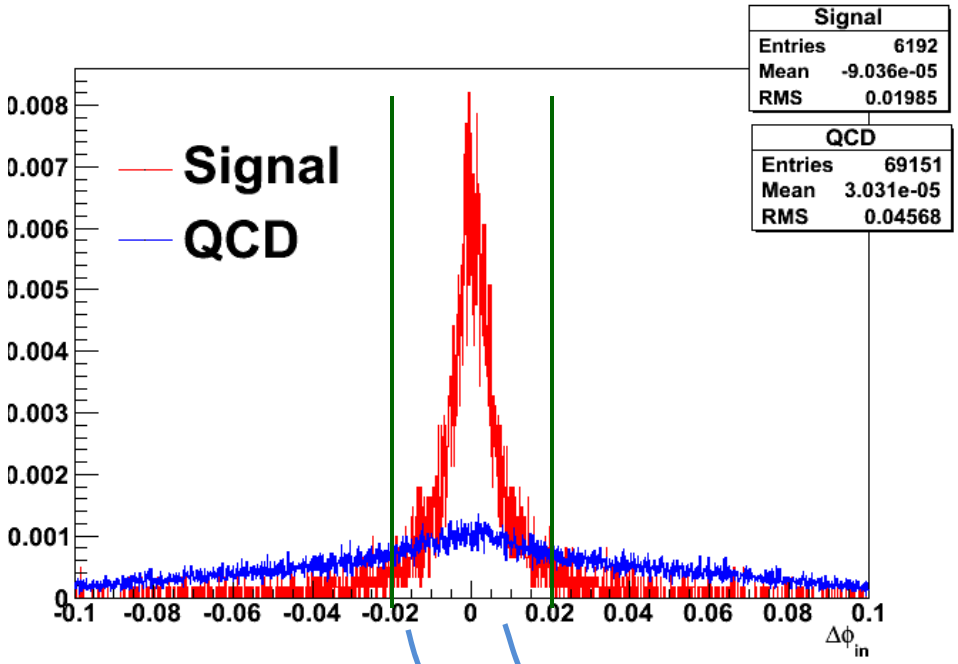


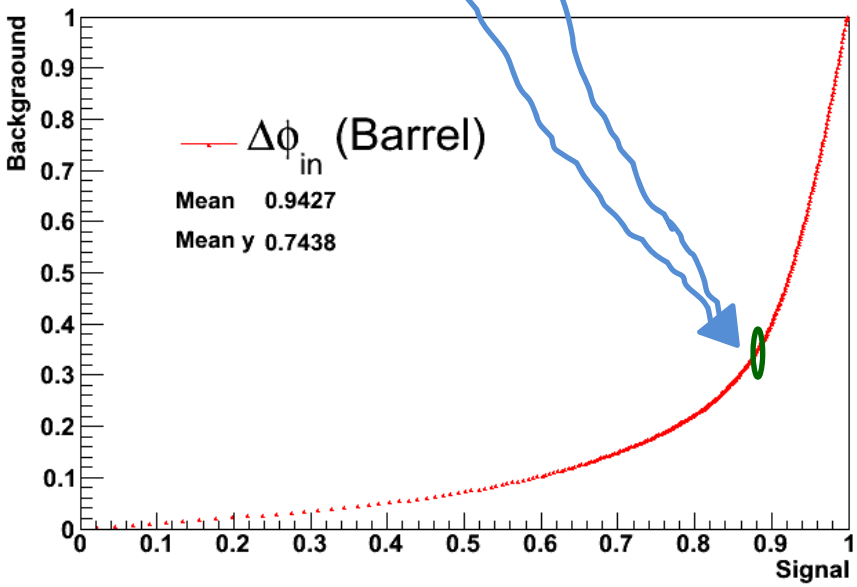


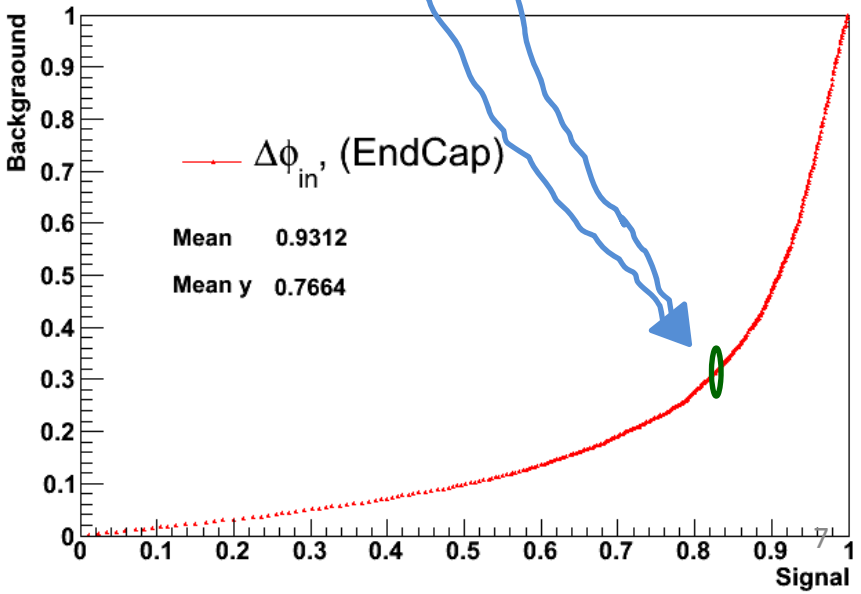


Part I: Id variables ($\Delta\phi_{in}$)

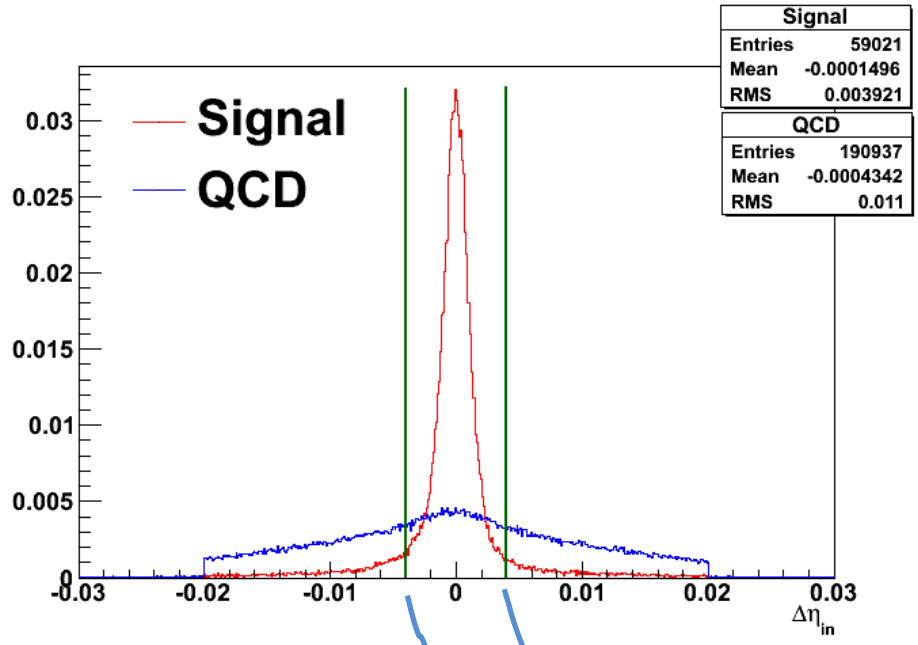


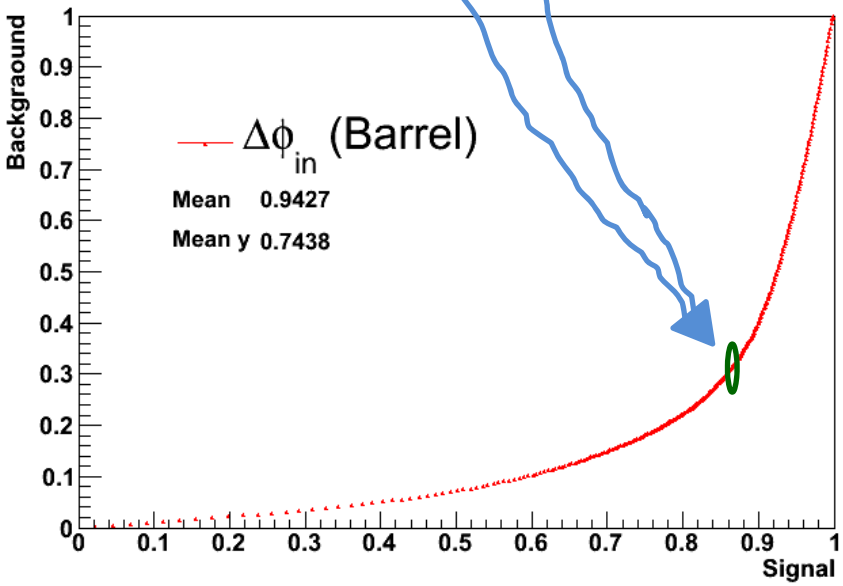


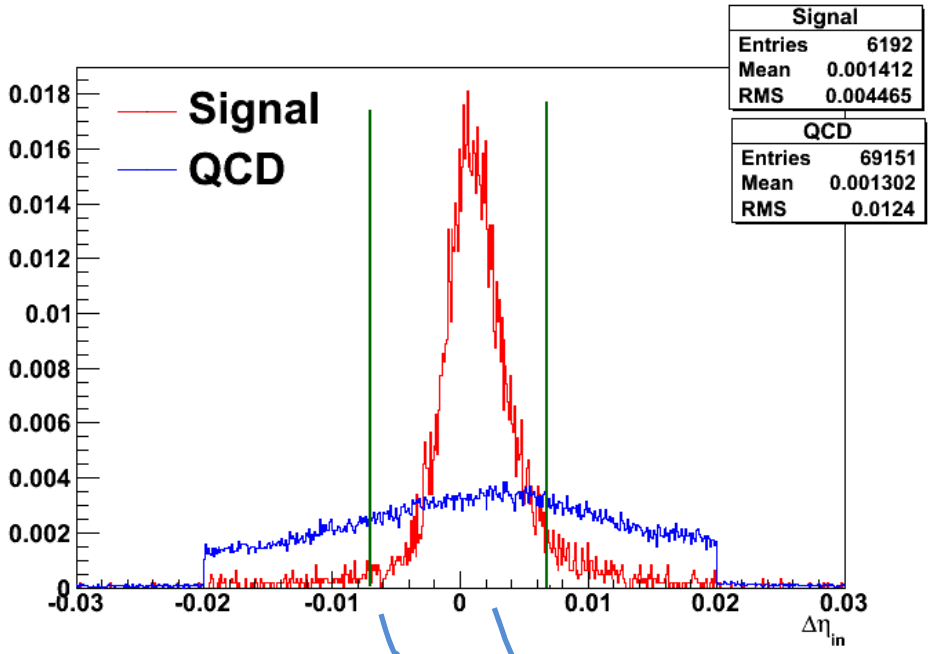


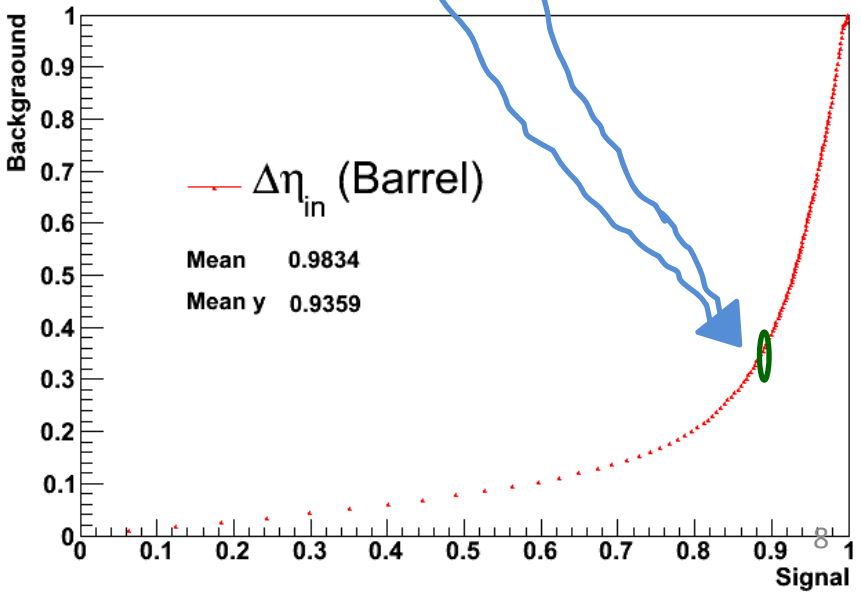


Part I: Id variables ($\Delta\eta_{in}$)





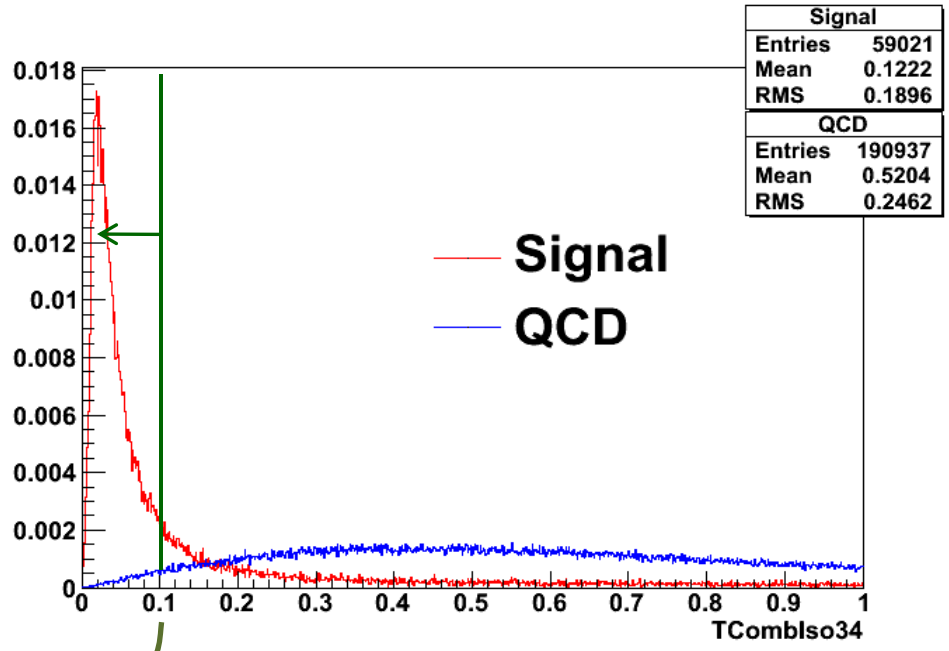


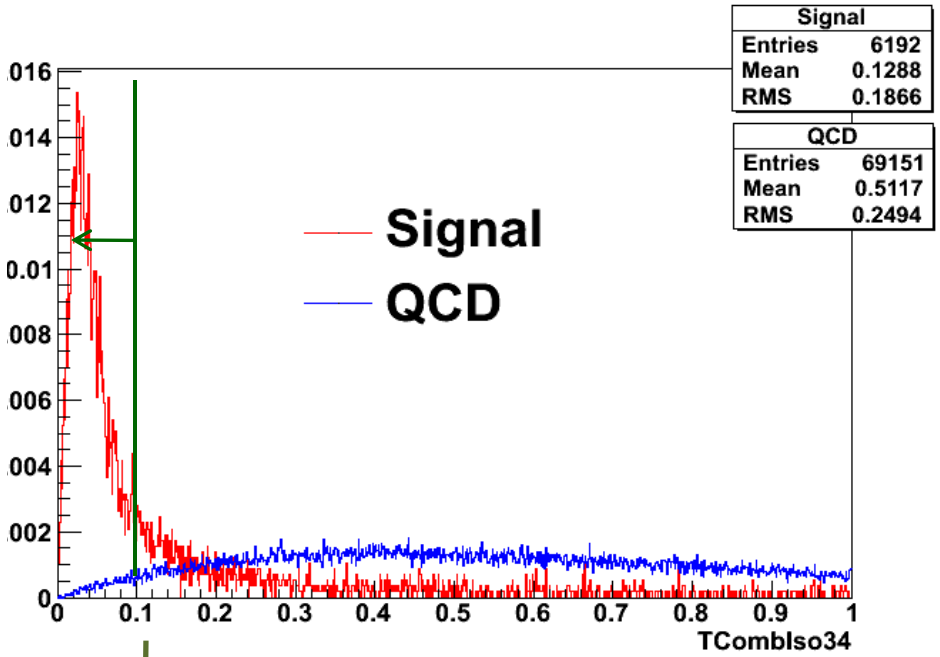


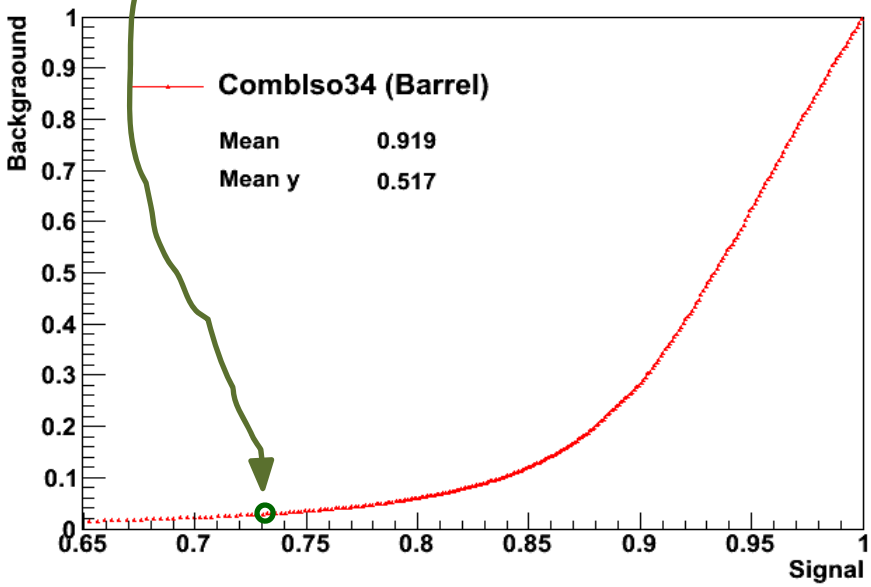
Part I: Id Conclusion

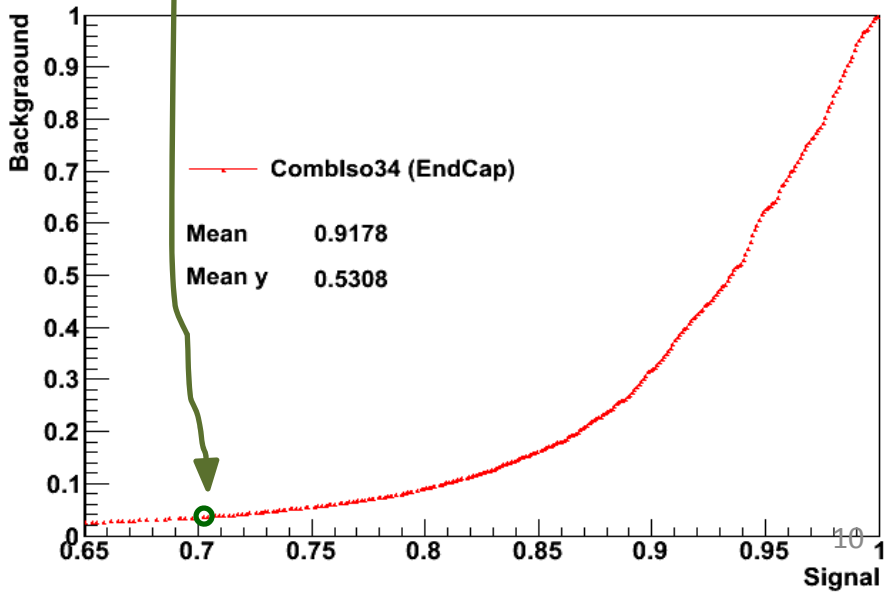
- In the robust tight identification, which is a simple cut-based selection, the cuts are reasonable to reject QCD vs. ttbar.
- A further check is to match the electrons in ttbar with a genElec. The electron in QCD also should be divided in to categories:
  - Having no match (really fake electrons)
  - Having a match with an electron coming from a B meson.

Part I: Iso variable (PAT default)

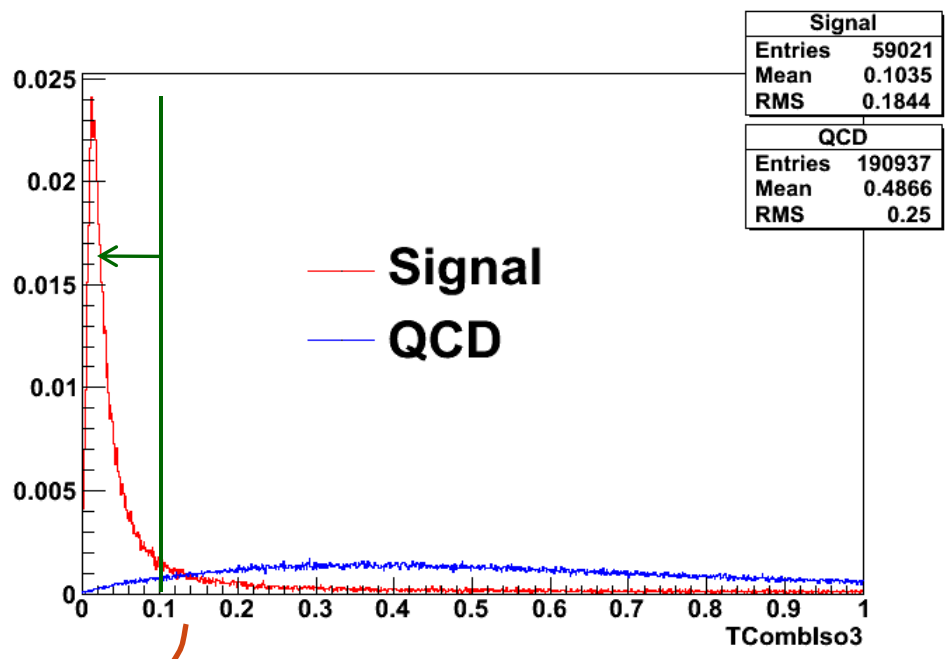


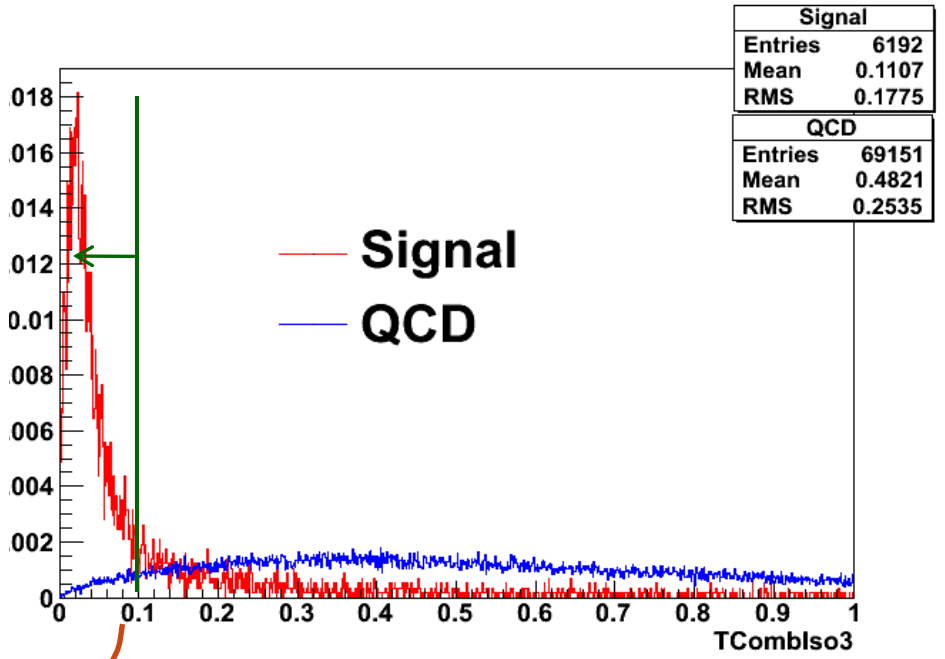


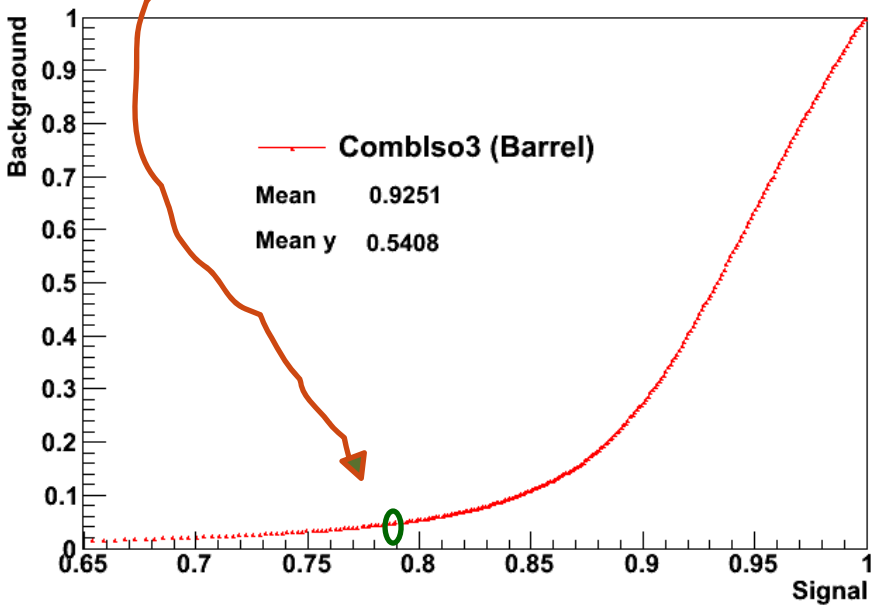


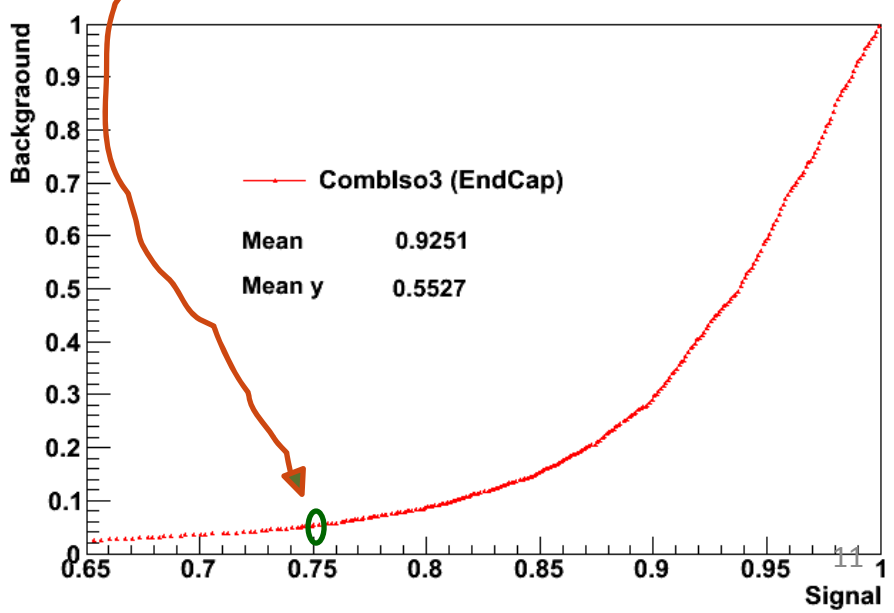


Part I: Iso variable (all cones: 0.3)









Part I: Iso Conclusion

- The cone size of 0.4 is too large (PAT default). It introduces a lot of noise in HCAL and reduces the electron efficiency.
- Comparing with the cone size of 0.3, the 0.4 cone size does not help in QCD rejection

Part II: Introduction

- **The Brussels people are working with a private package called TopTree.**
- **To be integrated with them and being able to share the codes, we are supposed to work with this package.**
- **All the analyses in Brussels have been in muon decay channel so far. So the electron part is not well developed.**
- **In the next slides, the problem with the electron isolation is shown. The corrected definitions are now tested and implemented in the package.** *(see backup slides)*
- **GenJet information is now accessible in the TopTree** *(By Maryam)*

Part III: Ongoing tasks with ttbar

Getting data from GRID:

Together with Maryam, we shared the task of getting data for the signal:

/TTbar/Summer09-MC_31X_V3-v1/GEN-SIM-RECO

and different backgrounds:

/QCD_BCtoE_Pt20to30/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
/QCD_BCtoE_Pt30to80/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
/QCD_BCtoE_Pt80to170/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
/QCD_EMEnriched_Pt20to30/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
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/QCD_EMEnriched_Pt80to170/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
/WW/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
/WZ/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
/Wenu/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
/Wgamma/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
/Wtaunu/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
/ZZ/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
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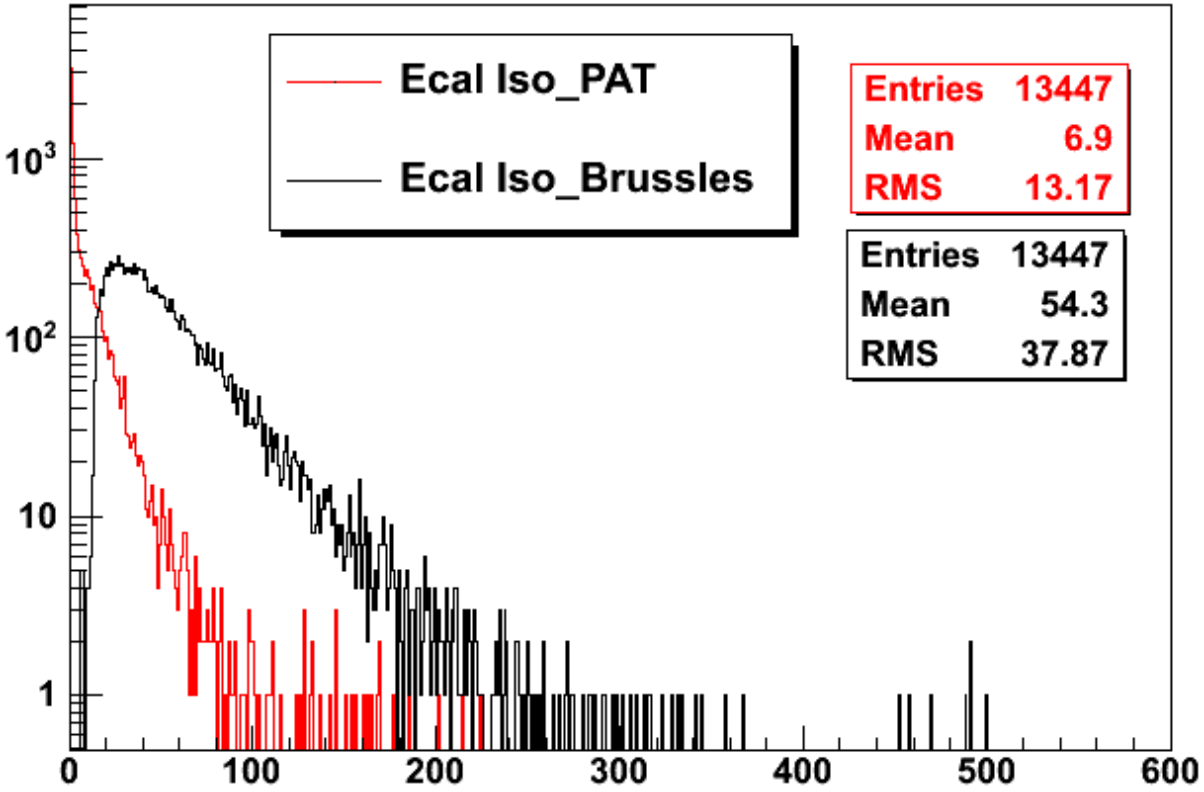
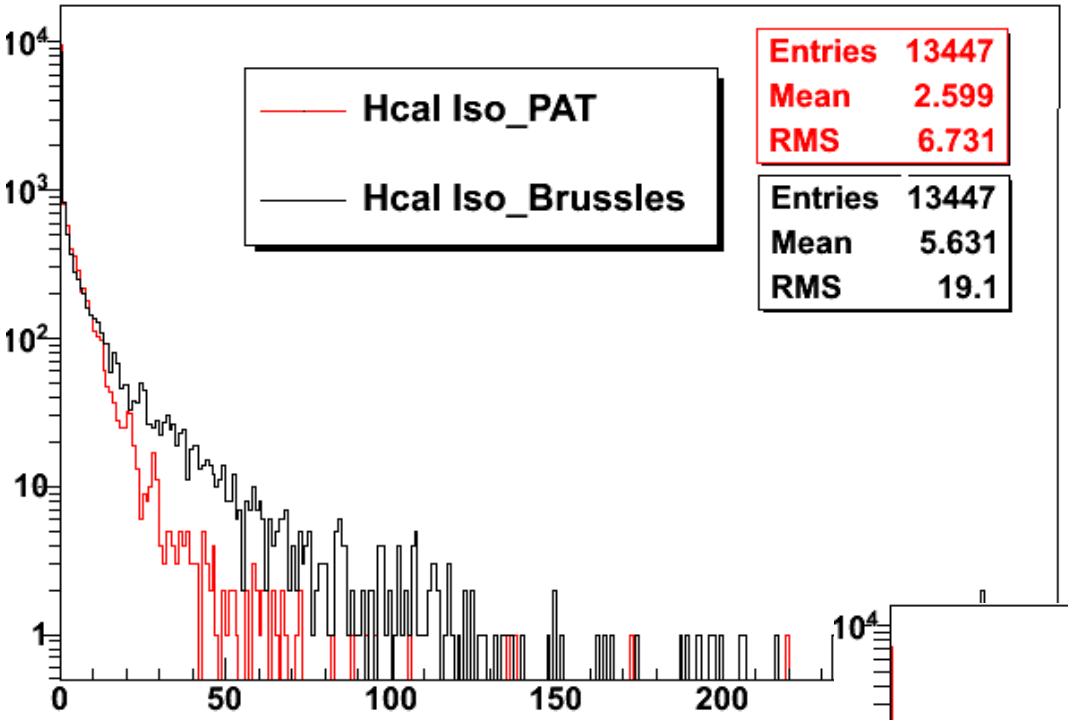
/Ztautau/Summer09-MC_31X_V3-v1/GEN-SIM-RECO
/ppEleX/Summer09-MC_31X_V3-v1/GEN-SIM-RECO

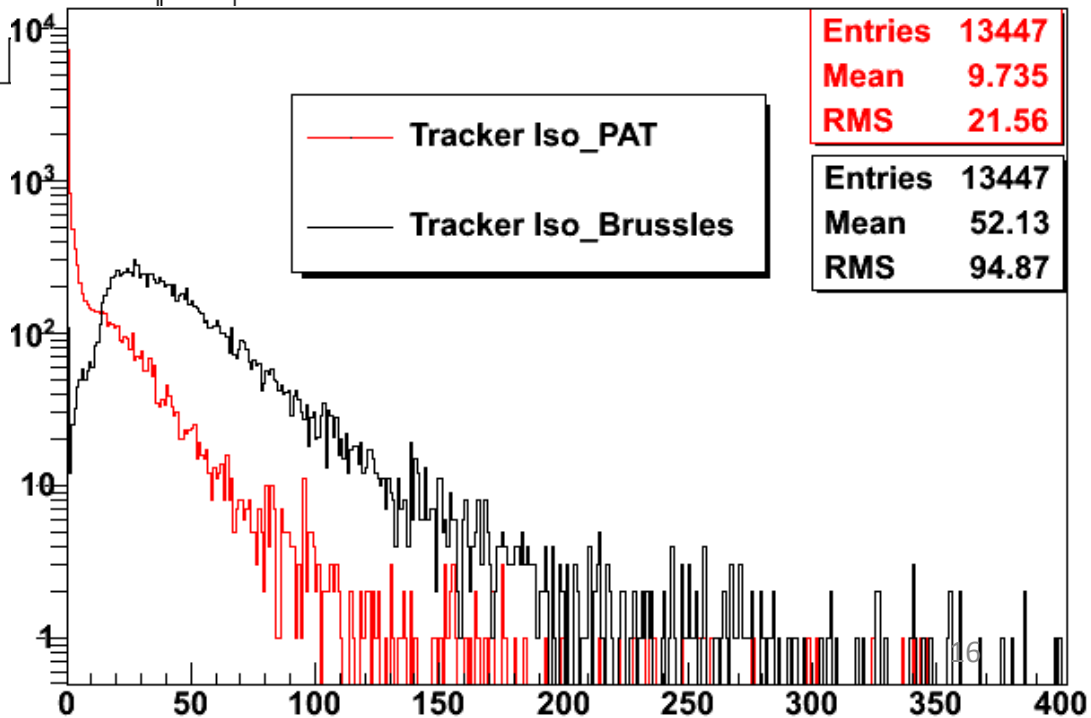
Part II: backup

- **The isolation definition and cut:**
  - **(ecalIso+hcalIso+trkIso)/et <0.1**
- **No electron was able to pass this cut!!**
- **A comparison with PAT showed that the isolation variables are filled without any veto...**



Part II: backup





The detail of the technicalities can be discussed in Friday meetings. If needed