
Non-Prompt J/psi Analysis

PbPb @ 5.02 TeV



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ALICE

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IFJ - ALICE Meetings

- QA for filtered trees
- Analysis on filtered tree and comparison with standard analysis for MC

Motivation : To use Same data samples for ML and standard analysis for MC and Real Data.

Selection Criteria for MC:

Track Cuts

p_T (1,30) GeV/c

$|\eta| < 0.9$

$|DCA_{xy}| < 1$

$|DCA_z| < 3$

TPCnClusters (70,160)

Reject Kinks

ITS Refit Requested

TPC Refit Requested

Requested SPD any layer

TPC χ^2 (0.1,4)

ITS χ^2 (0, 36)

TPCnClsShared Ratio < 0.3

TPCCrossedRows/FindableCls (0.8,2)

Track Prefilter Cuts

p_T (0.9,100) GeV/c

Pair Cuts

M (2,4) GeV/c²

p_T (0,100) GeV/c

$|\eta| < 0.9$

Pair Prefilter Cuts

Mass > 50 MeV/c²



Track Cuts

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p_T (0,100) GeV/c

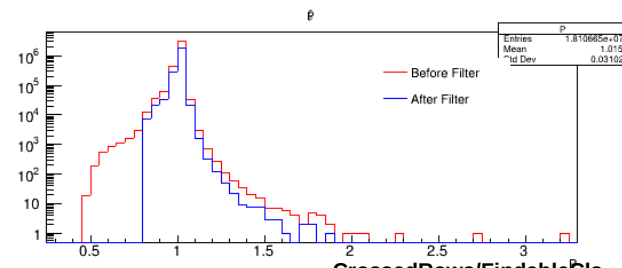
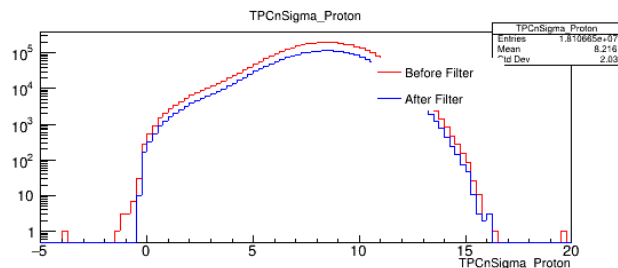
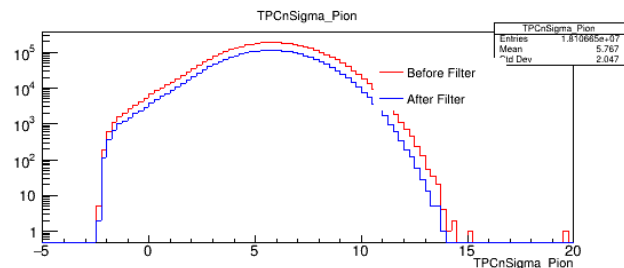
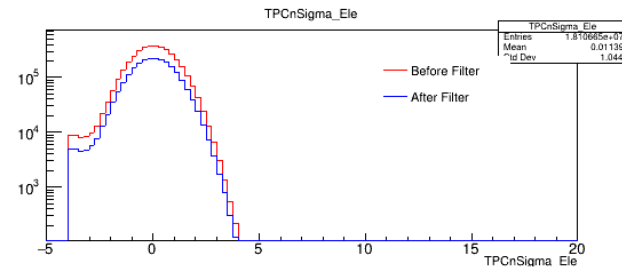
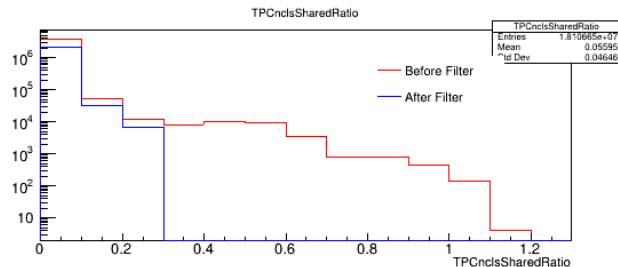
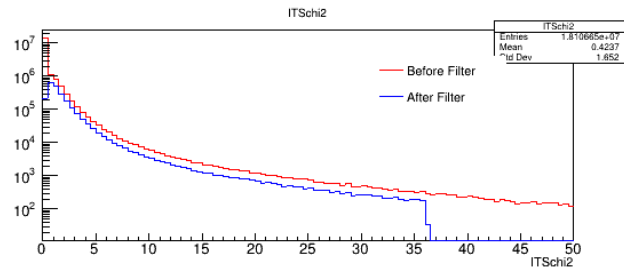
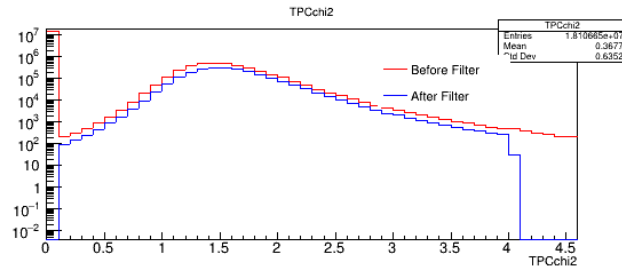
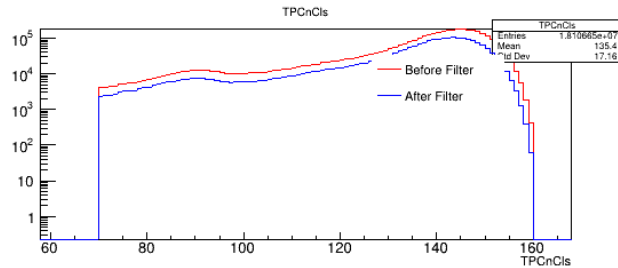
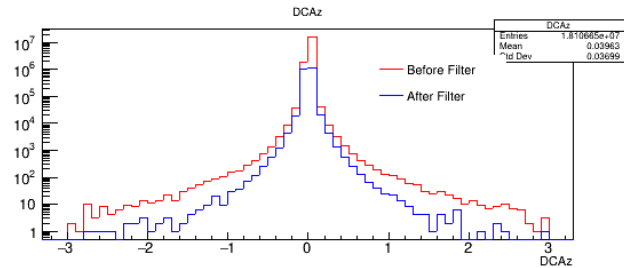
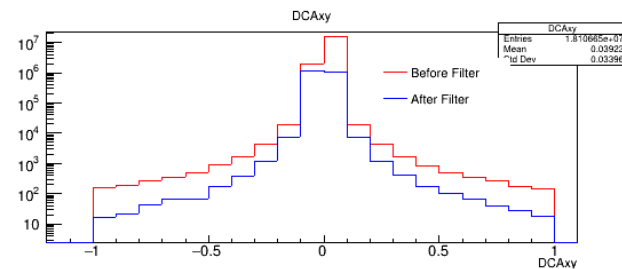
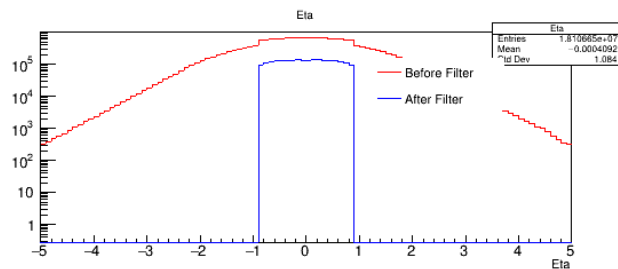
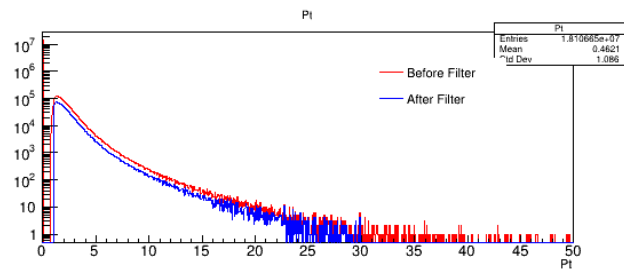
$|\eta| < 0.9$

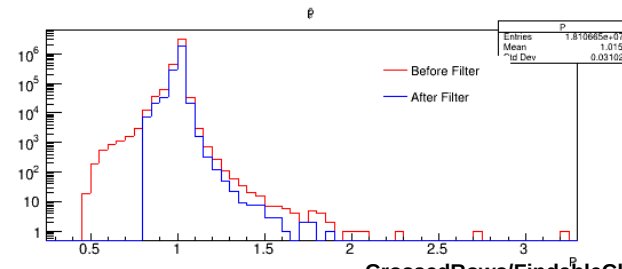
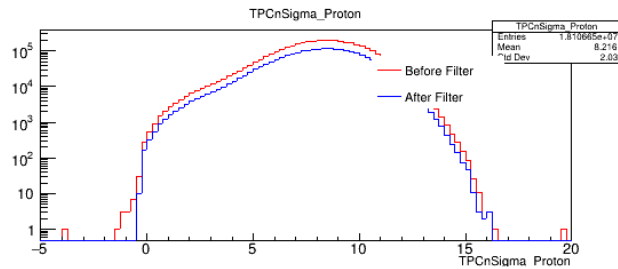
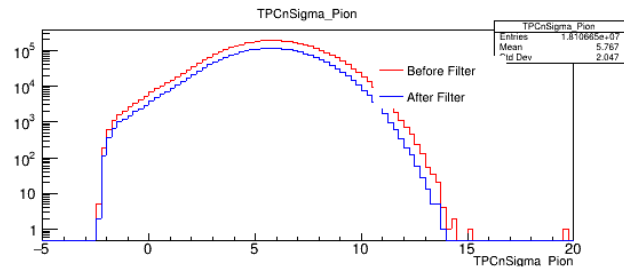
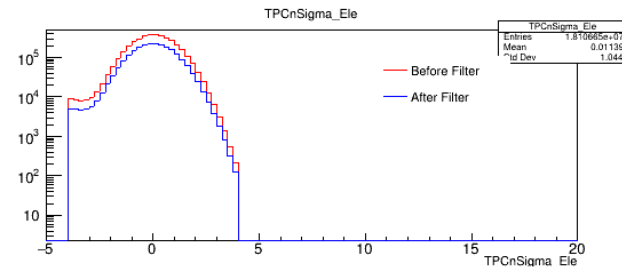
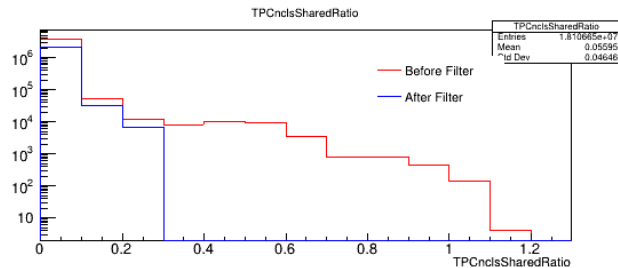
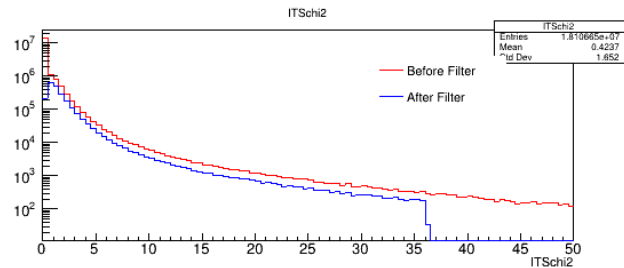
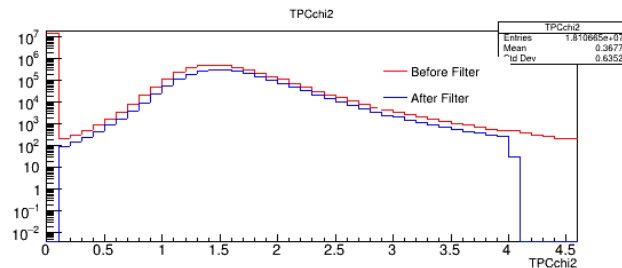
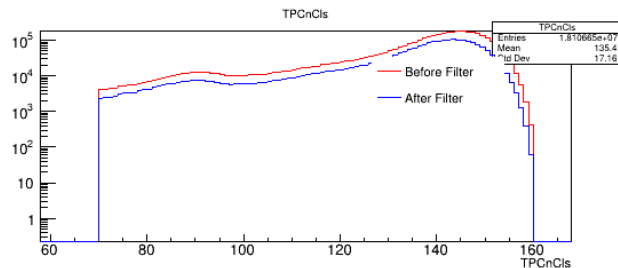
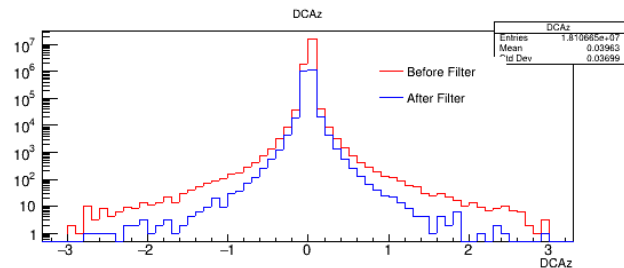
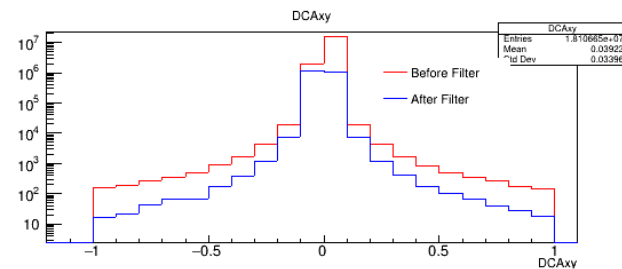
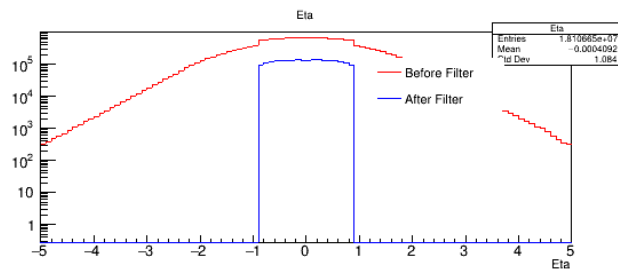
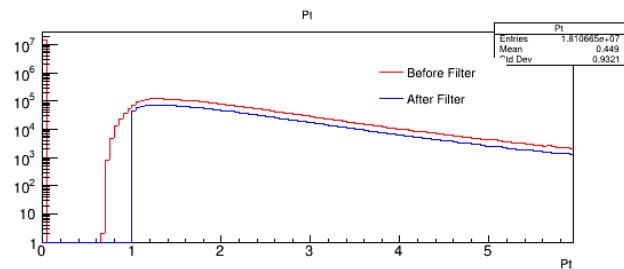
Pair Prefilter Cuts

Mass > 50 MeV/c²

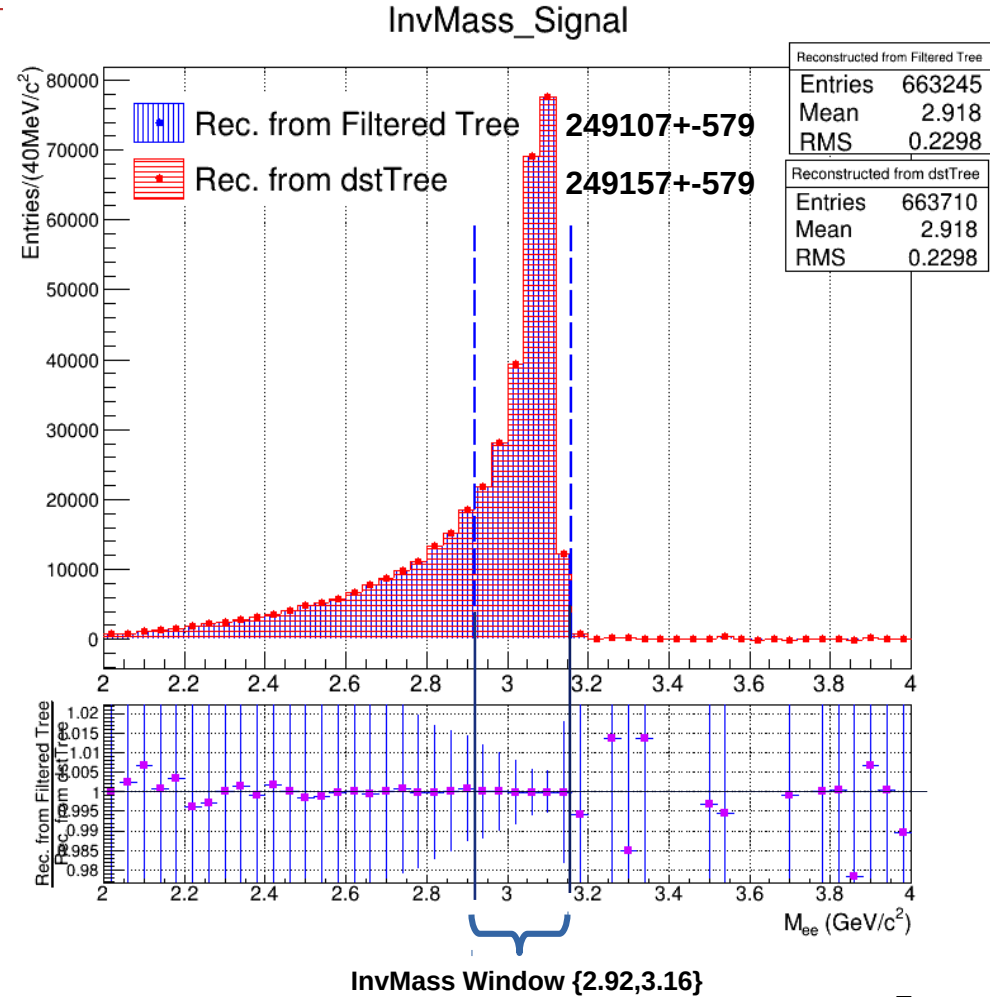
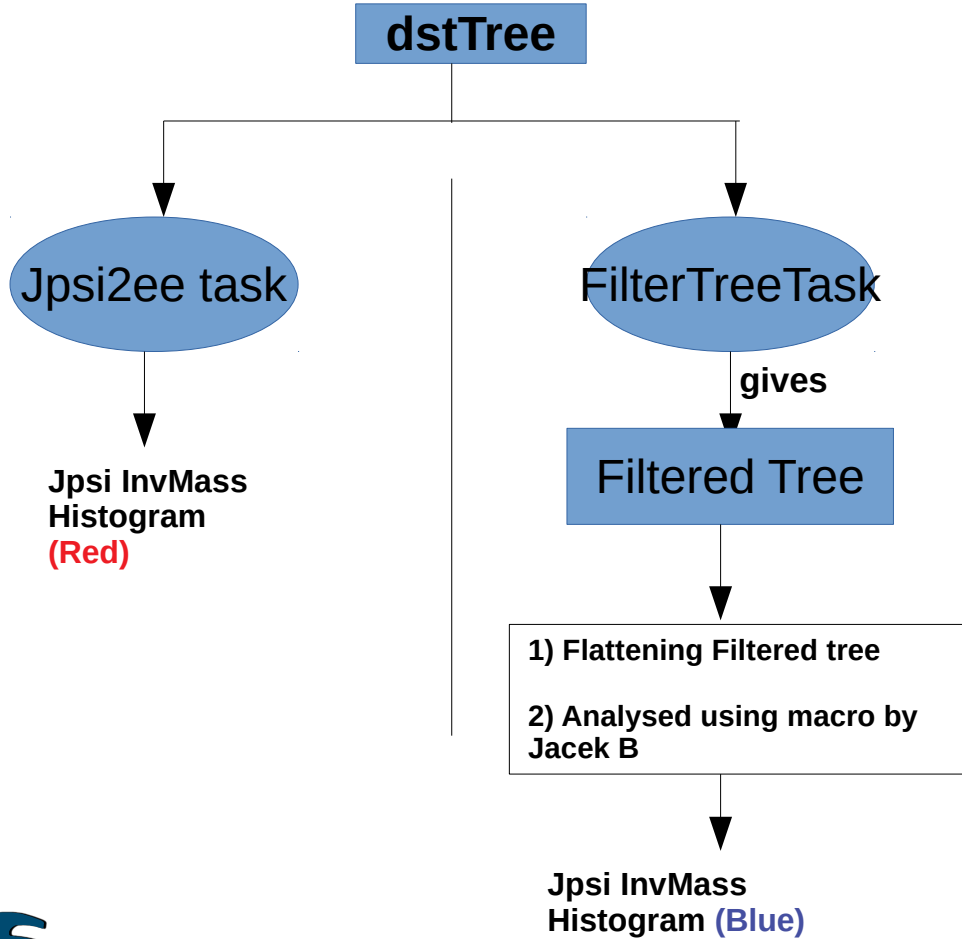
**QA results after the
selection criteria**







J/psi Reconstruction for MC (Standard vs Filtered)



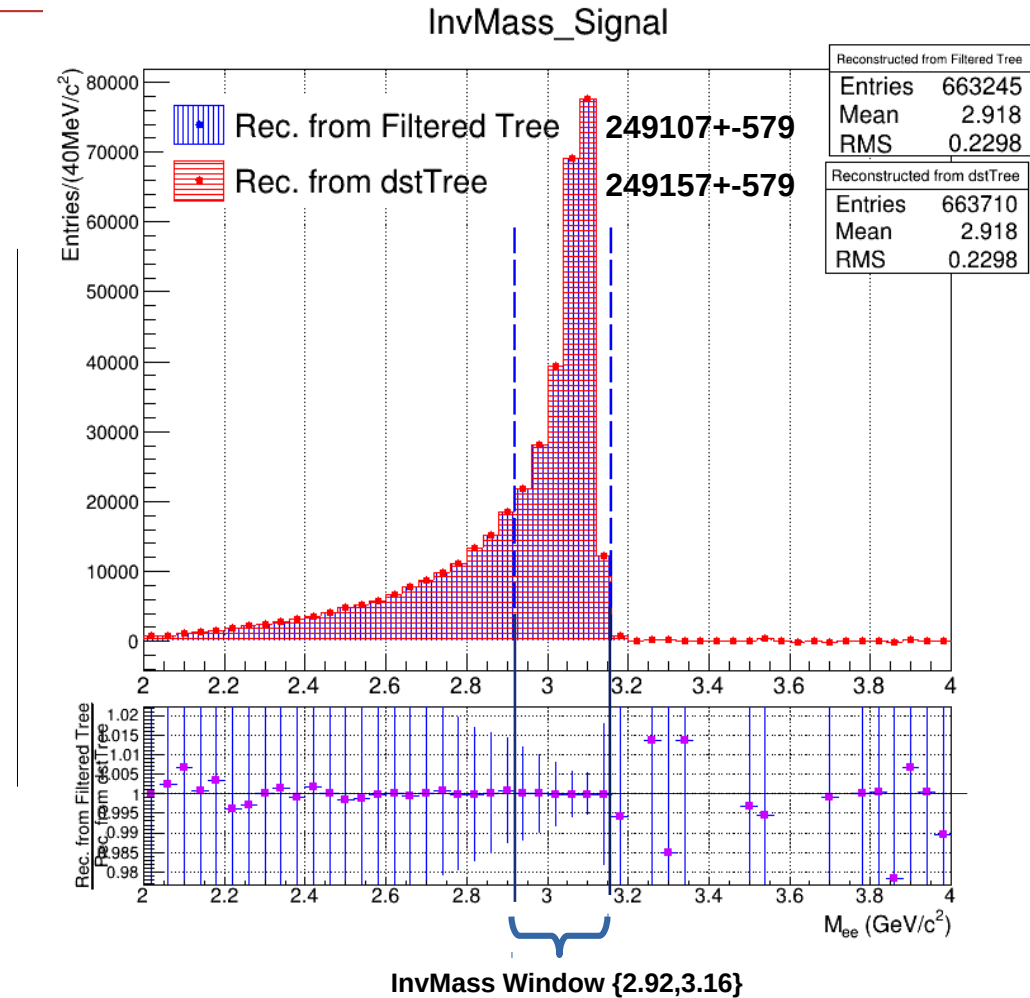
J/psi Reconstruction for MC (Standard vs Filtered)



- **DataSet :**
 - MC injected Jpsi (PbPb)
 - 0 – 10 % (Central)
 - ~2M events
- Same selection criteria applied in both cases.
- In case of filtered tree, I got 50 Jpsi less than standard.
- Difference between both = 0.02 %

Number of Tracks in Filtered Tree and tracks analysed in standard analysis are exactly same.

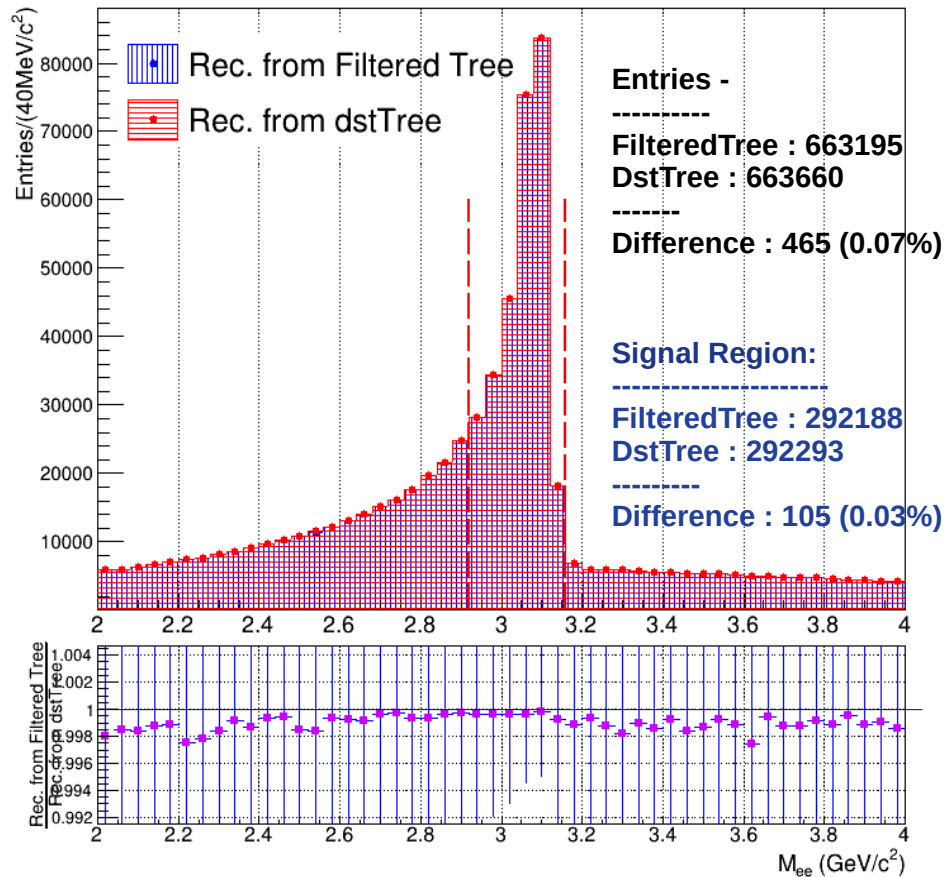
=> It means the track Selection criteria is exactly same for both cases



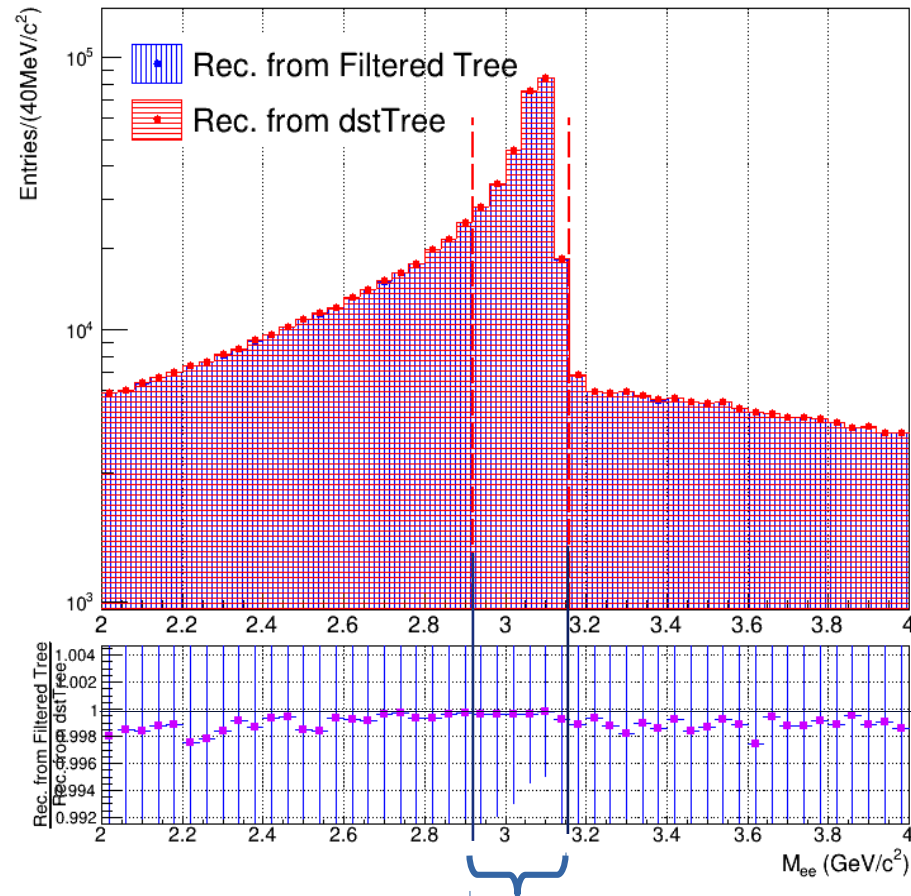
J/psi (Signal+BKG) for MC (Standard vs Filtered)



epem



epem

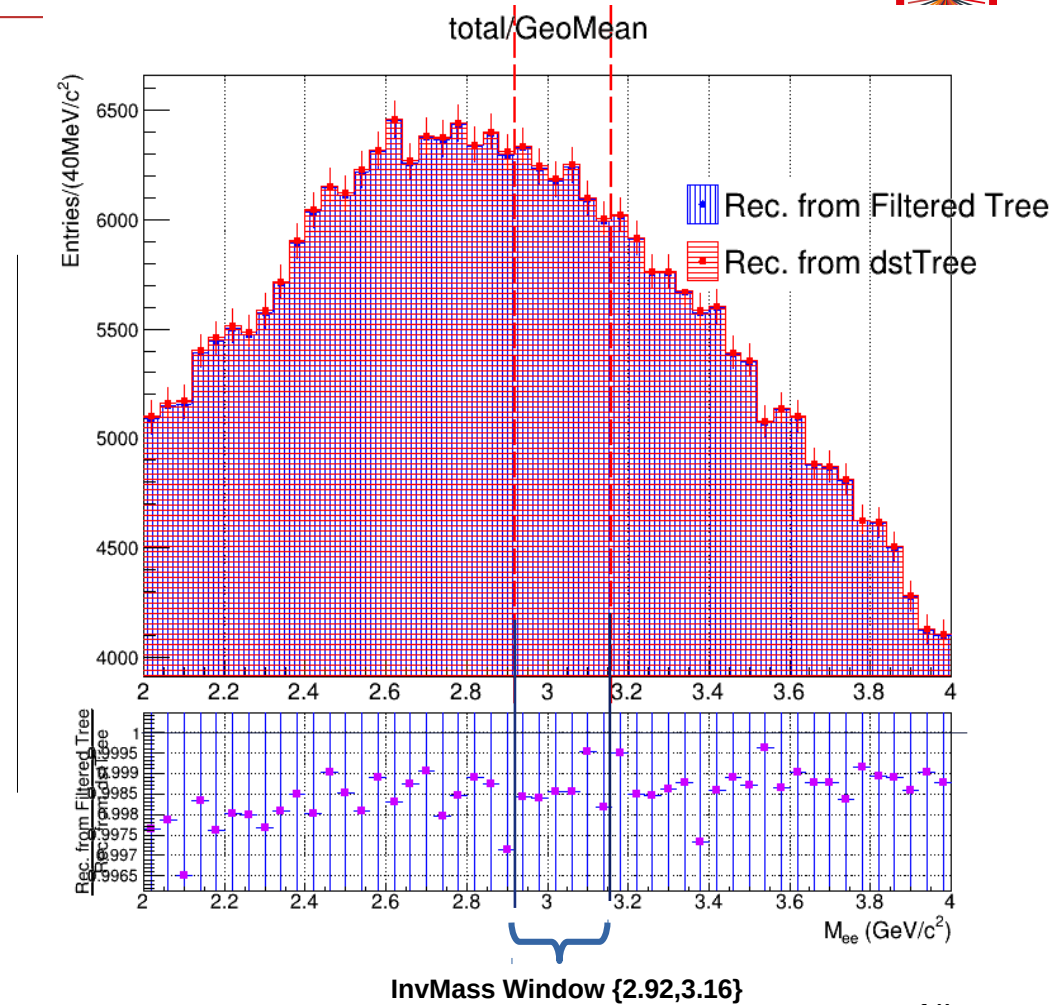


InvMass Window {2.92,3.16}

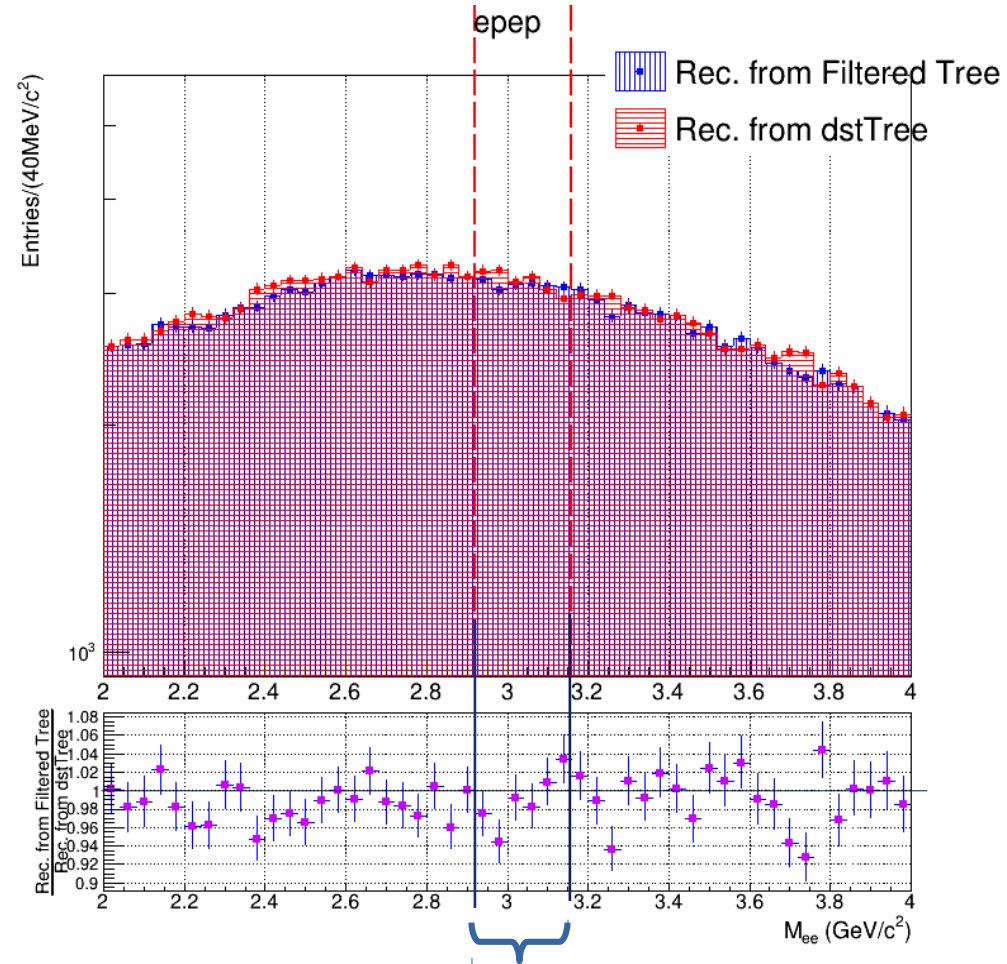
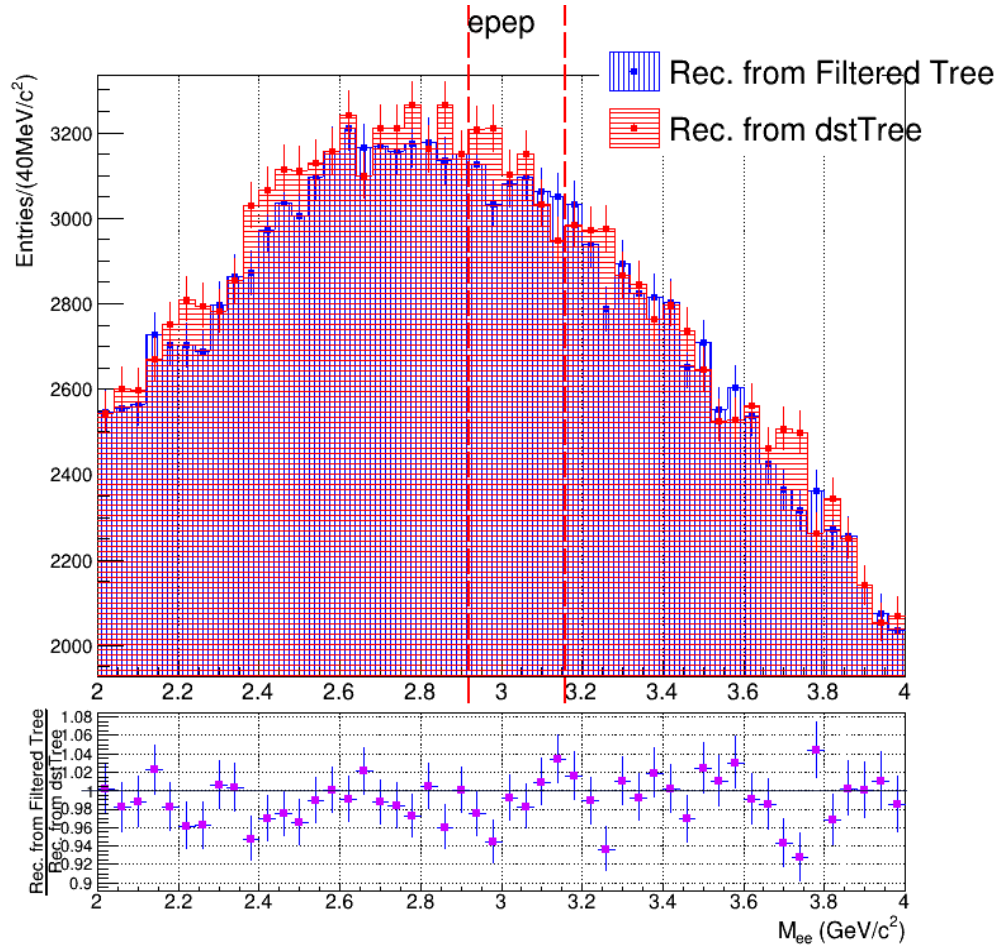




- **Total Entries :**
 - **Filtered Tree : 280263**
 - **DstTree : 280695**
 - **Difference : 432 counts ~ 0.15%**
- **In Signal region (InvMass Window) :**
 - **FilteredTree:- 43078.7**
 - **DstTree:- 43133.7**
 - **Difference : 55 counts ~ 0.13%**



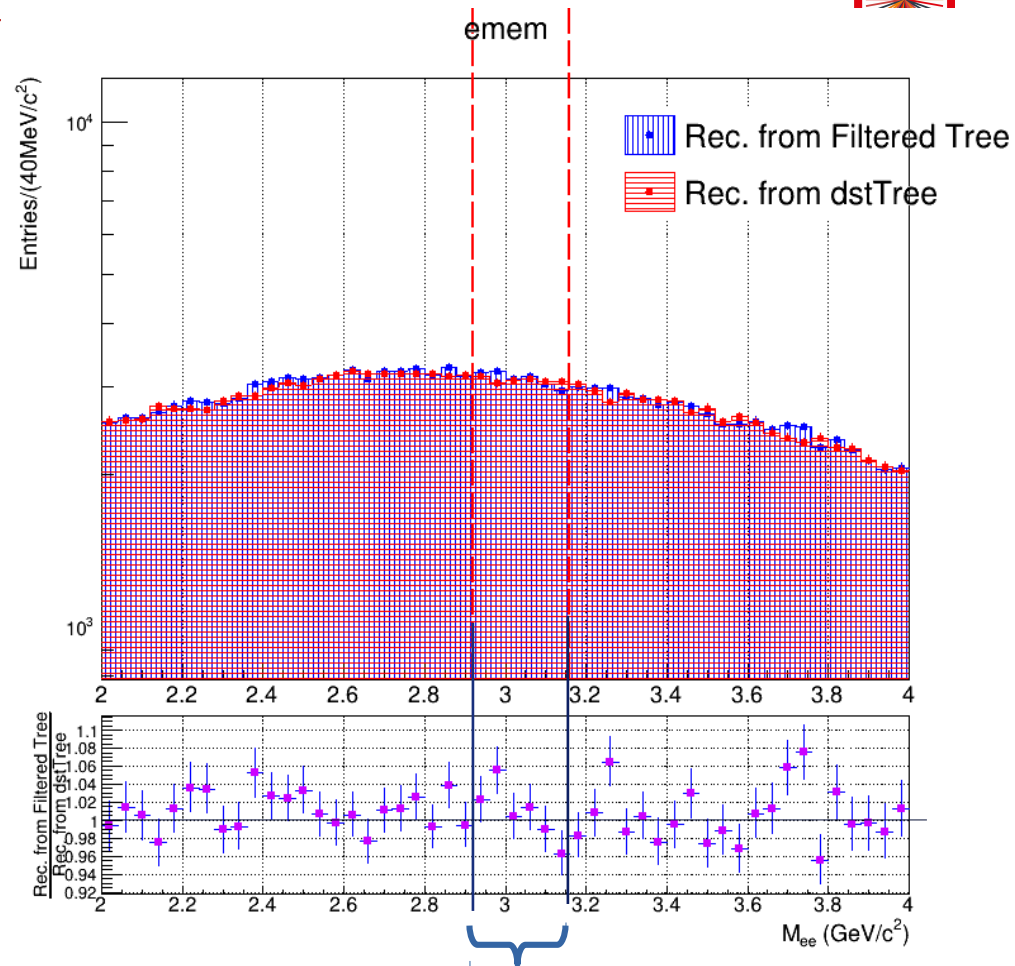
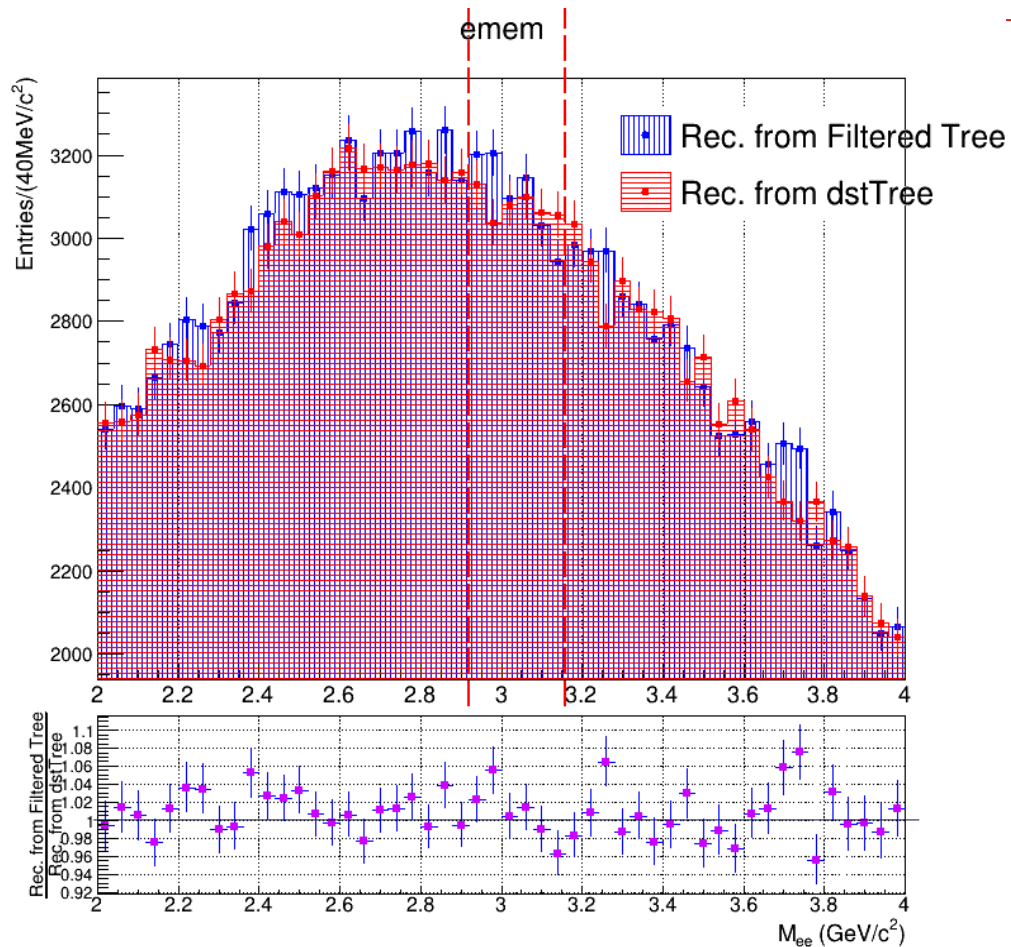
J/psi (PP-LikeSign)



InvMass Window {2.92,3.16}



J/psi (MM-LikeSign)

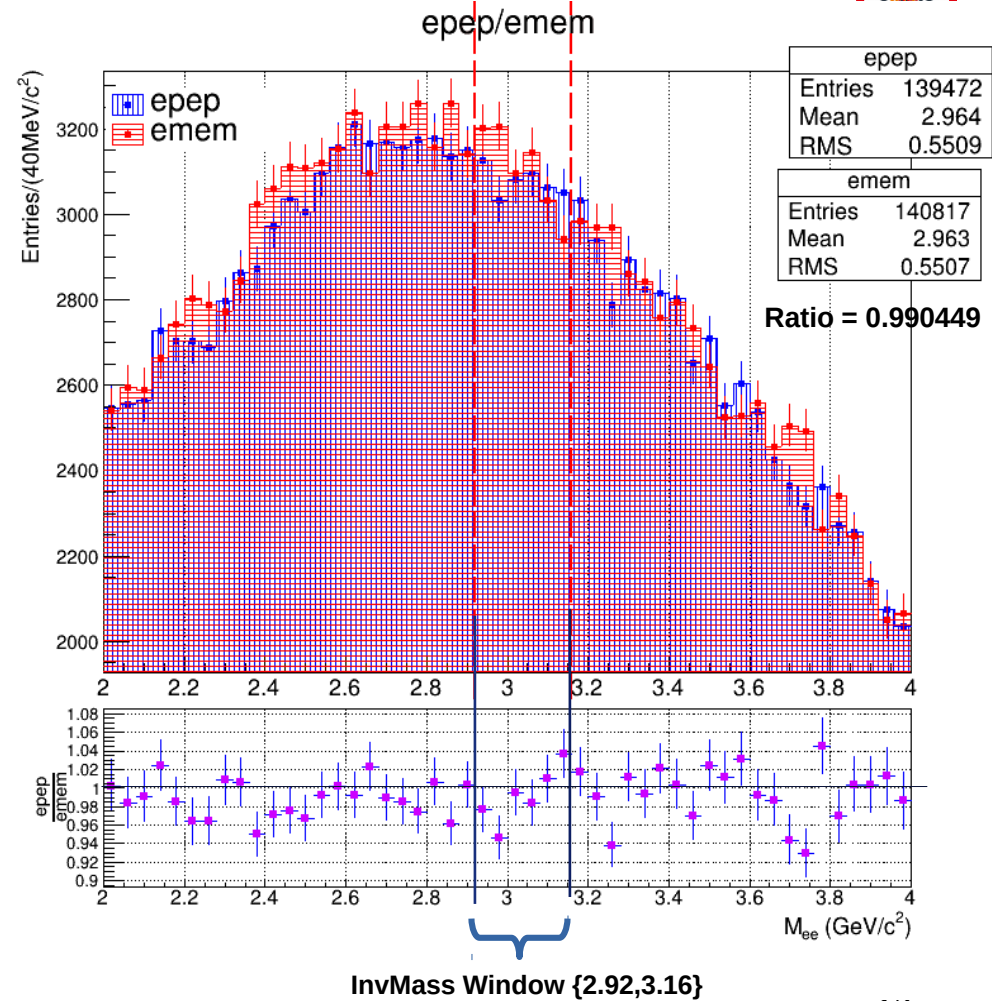
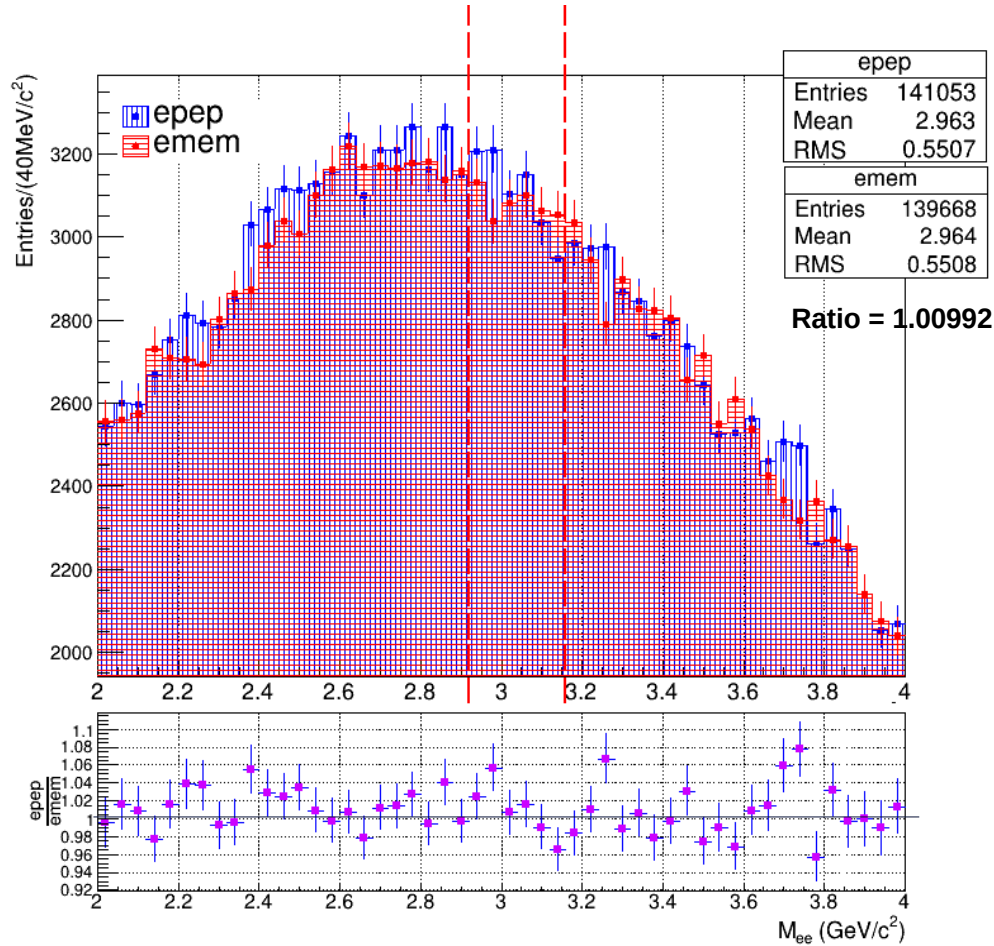


InvMass Window {2.92,3.16}

Standard

vs

Filtered Tree



Conclusions:

- Track cuts gives the same number of tracks in both cases.
- ~ 0.02% less J/psi yield in the Filtered Tree analysis than standard one.
- ~ 0.15% less background in the Filtered Tree analysis than standard one.
- Reduction of both Signal (50 counts) and Bkg (55 counts) in the Filtered Tree analysis case.
- In my opinion, both the methods agrees with the total number of reconstructed Jpsi.

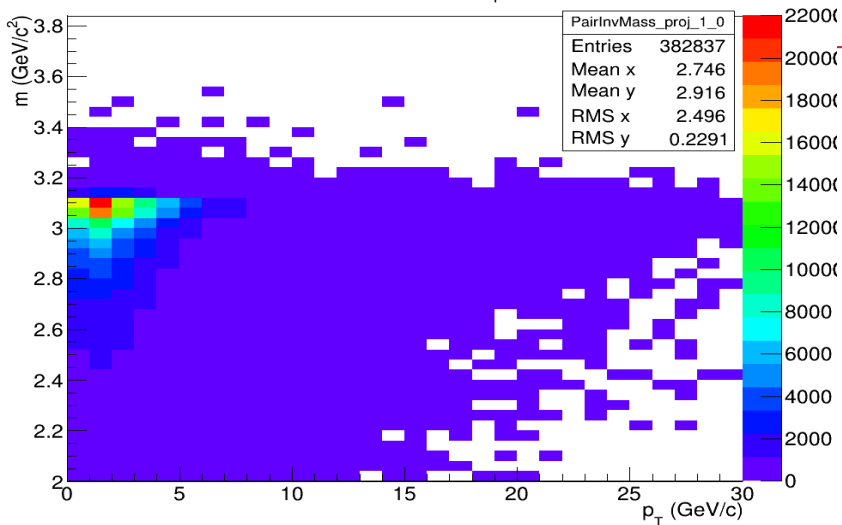
Some Distributions of our interest:



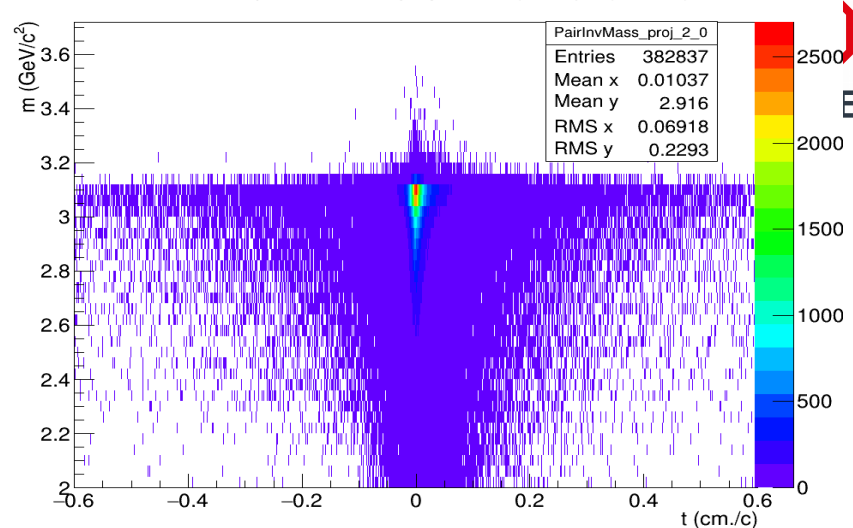
- $P_{s\text{Proper}} \text{DL} - x(p_T)$
- $M(p_T), M(x)$



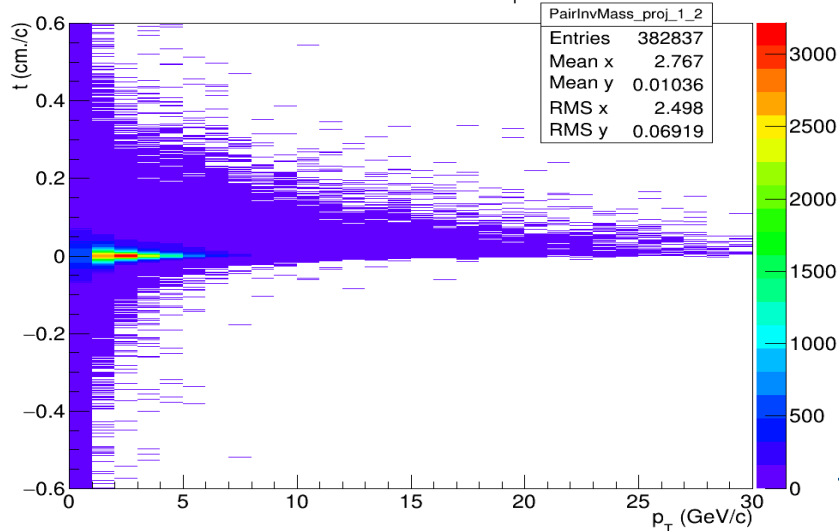
Differential pair inv. mass projection p_T (GeV/c) m (GeV/c²)



Differential pair inv. mass projection t (cm./c) m (GeV/c²)



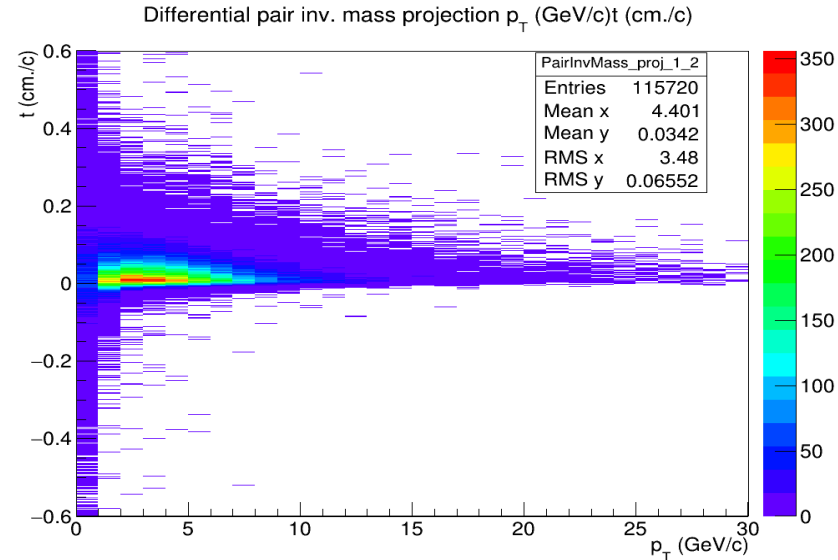
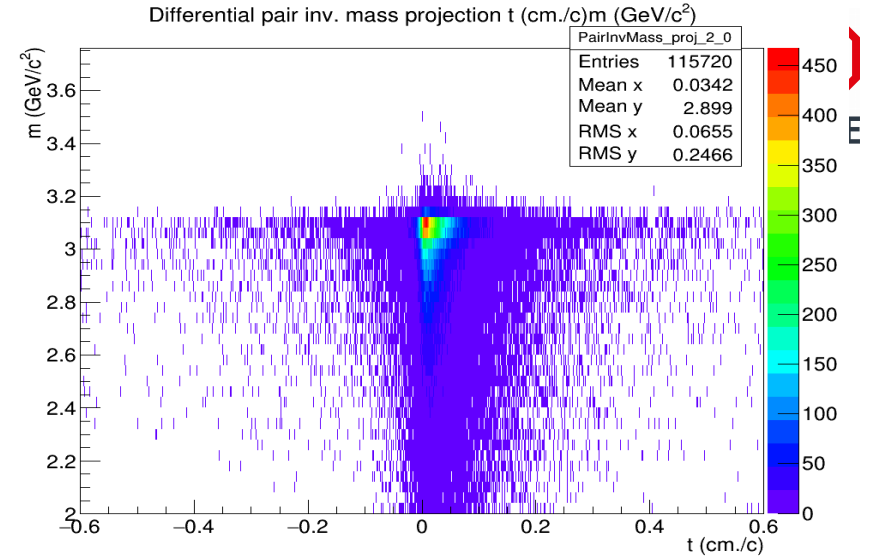
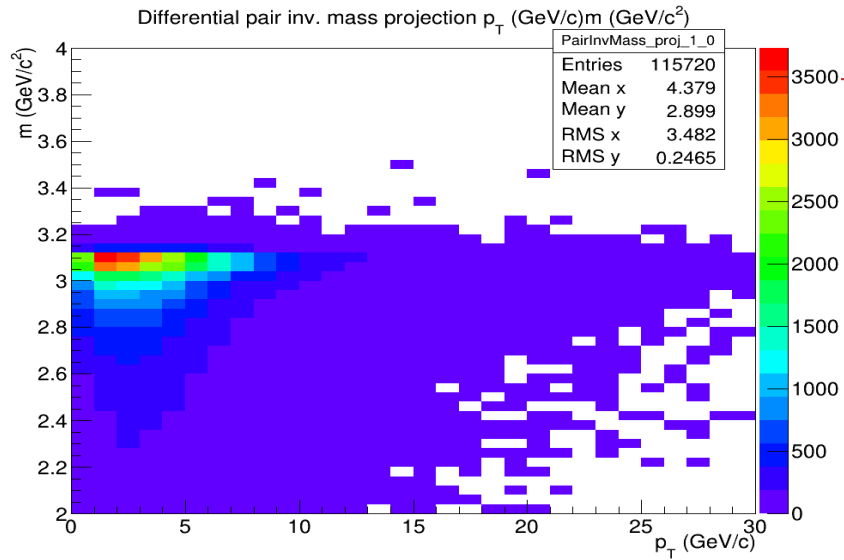
Differential pair inv. mass projection p_T (GeV/c) t (cm./c)



For Reconstructed
TrueElectron

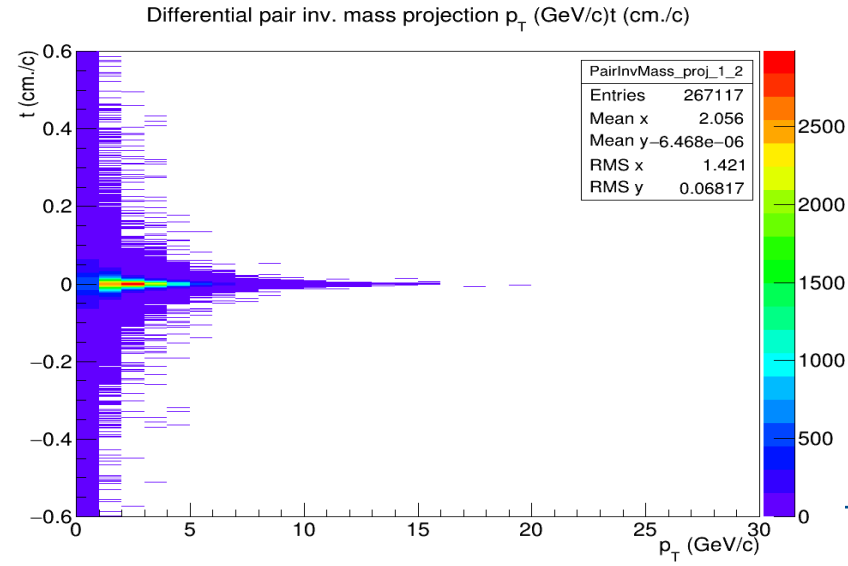
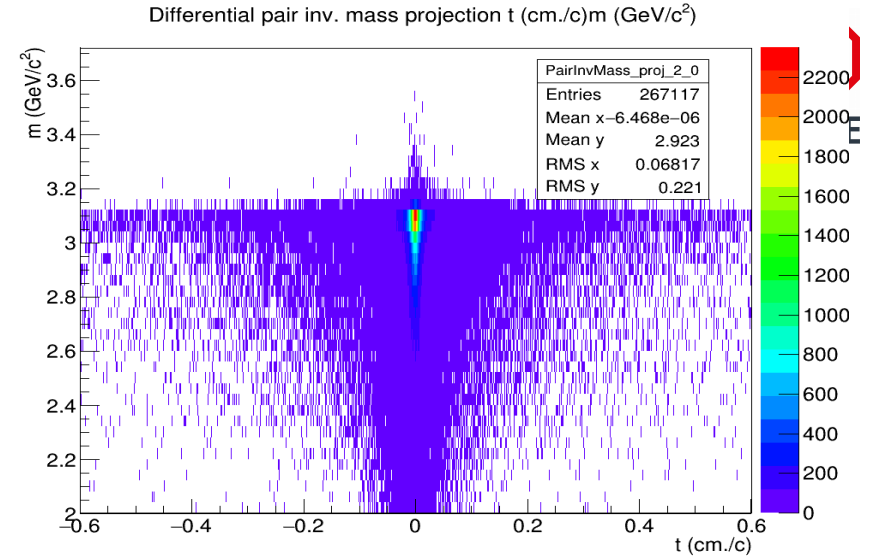
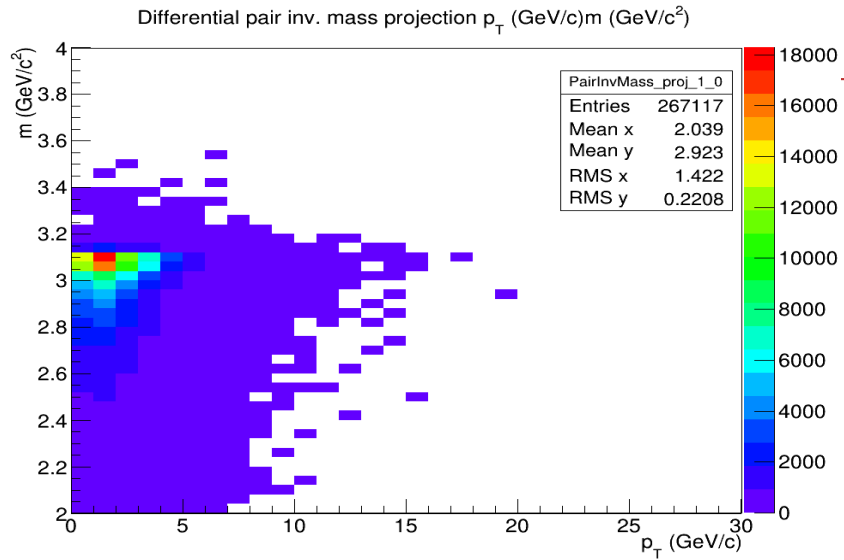
$t(\text{cm./c}) \sim \text{PsProper}$
Decay length





**For Reconstructed
True Electron
NonPrompt**





**For Reconstructed
TrueElectron Prompt**



Next Plan:



- QA for Data
- Same Comparison for Data
- There are additional selection for Data (For example: PileUp rejection, PID-postcalibration)

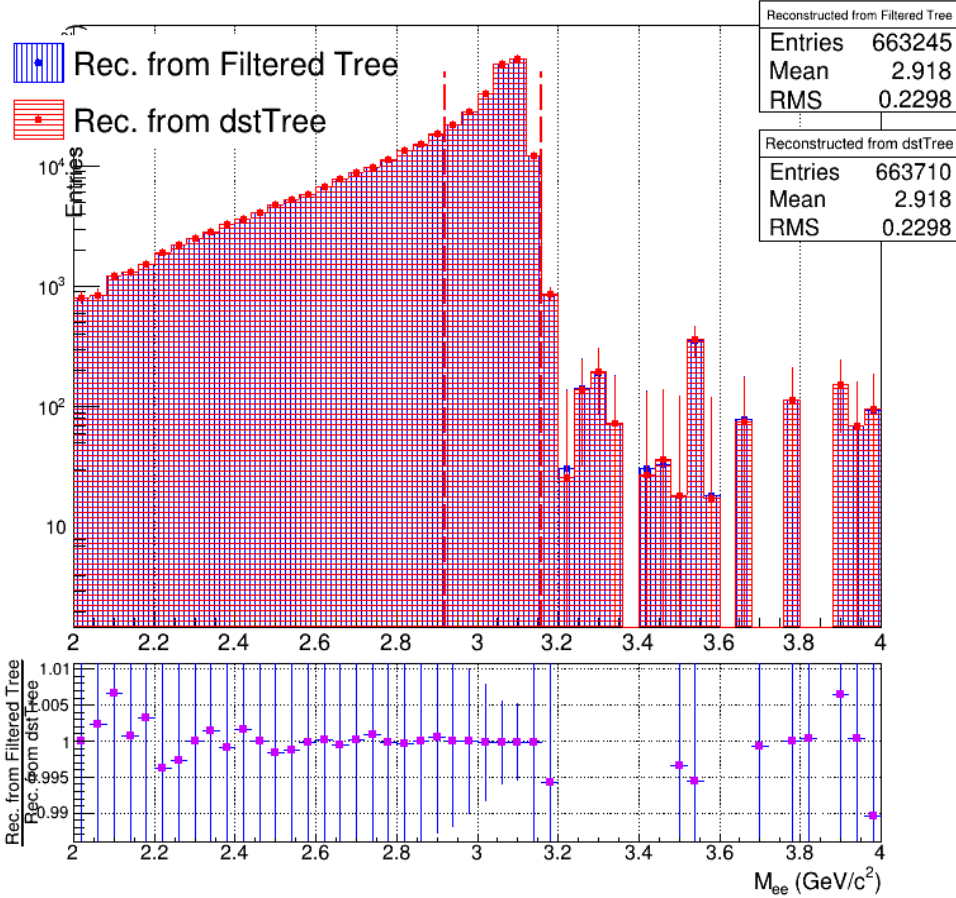


Backup

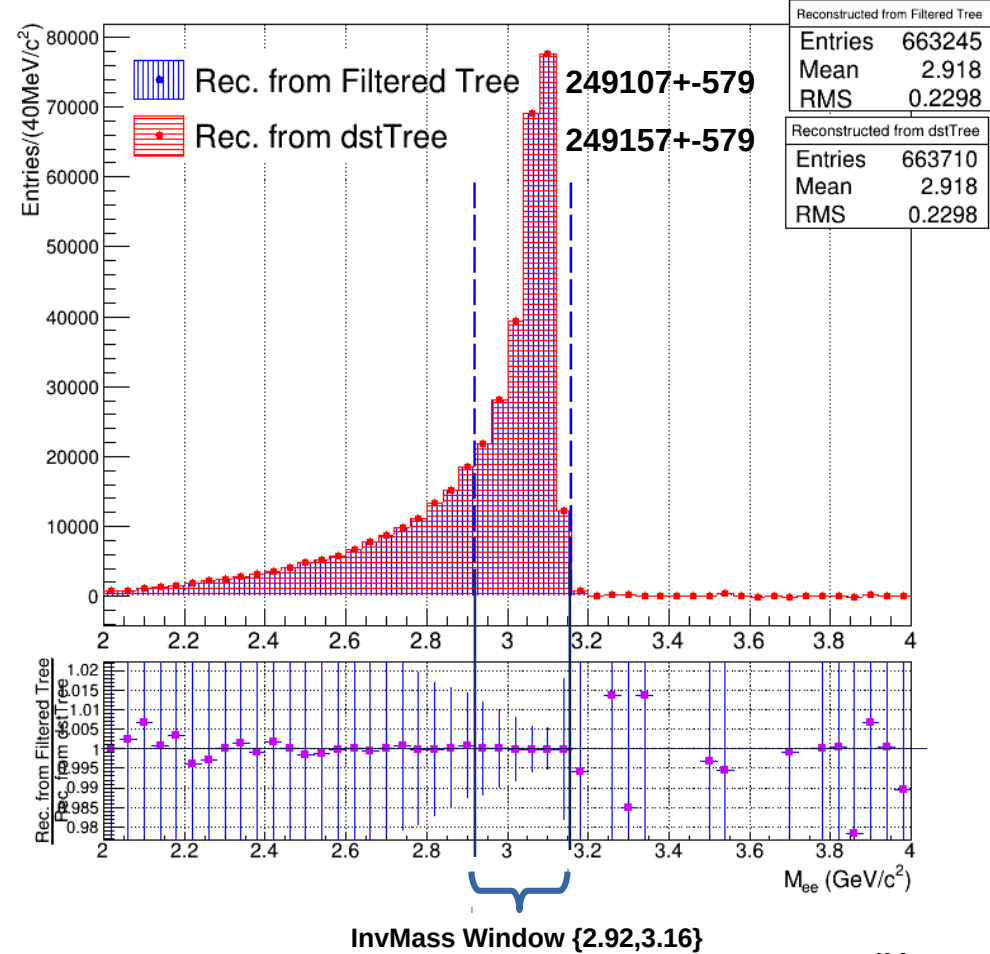
J/psi Signal for MC (Standard vs Filtered)



InvMass_Signal



InvMass_Signal



J/psi Reconstructed True Electron for MC

