

Electrons with EMCal photon trigger in 2011 PbPb collisions

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Overview

- ▶ Looked at electrons in LHC11h pass2
- ▶ EMCal photon trigger (EMCEGA)
 - ▶ Shower trigger (sum up cluster energies)
 - ▶ Trigger threshold --- centrality dependence
- ▶ Used HFE package + LEGO train
 - ▶ First attempt to use HFE on Grid
 - ▶ Used LEGO train framework
 - ▶ Run without Tender Supply
 - ▶ Not necessary for EMCal in pass2
 - ▶ TPC need to tender to correct dE/dx ?

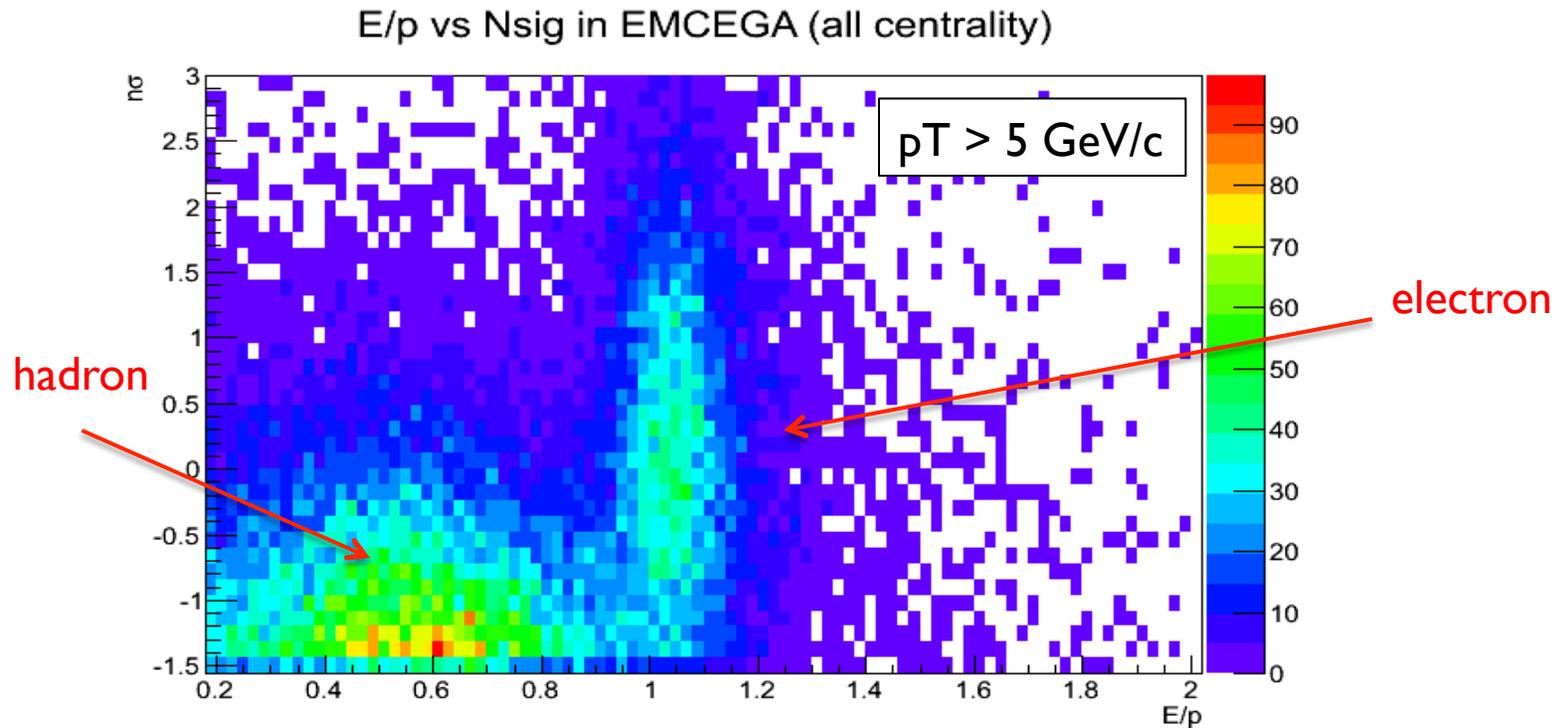
Electron identification cut

- ▶ **Events ; EMCEGA (EMCal photon trigger)**
 - ▶ Selected global quality = 1 (55)
 - ▶ 3 runs fail & 30% jobs were failed
 - ▶ ~2M events after Z cuts
- ▶ **Z vertex cuts ; ± 10 cm**
- ▶ **Track cuts (almost same as pp at this moment)**
 - ▶ # of TPC cluster > 120
 - ▶ # of ITS clusters > 3
 - ▶ SPD hits ; kAny
 - ▶ nSigma cut ; -1.5 to $3 \sigma_{\text{TPC-dE/dx}}$
 - ▶ E/p cut ; 0.85 to 1.3



nSigma vs. E/p

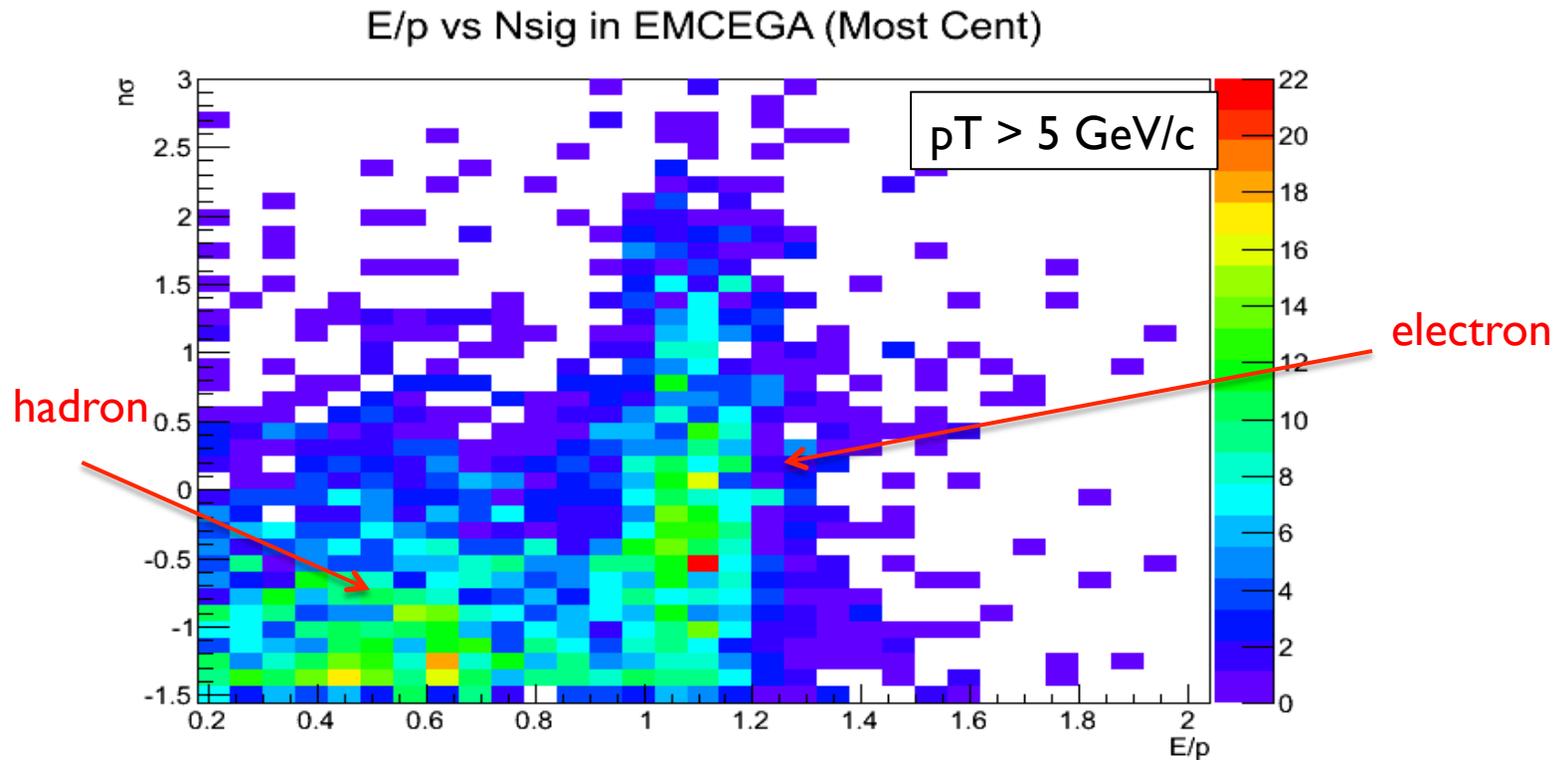
- ▶ TPC nSigma and E/p correlation in all centrality



- ▶ Electron signal ; $E/p \sim 1$ & TPC nSigma ~ 0
- ▶ Clear hadron and electron separation

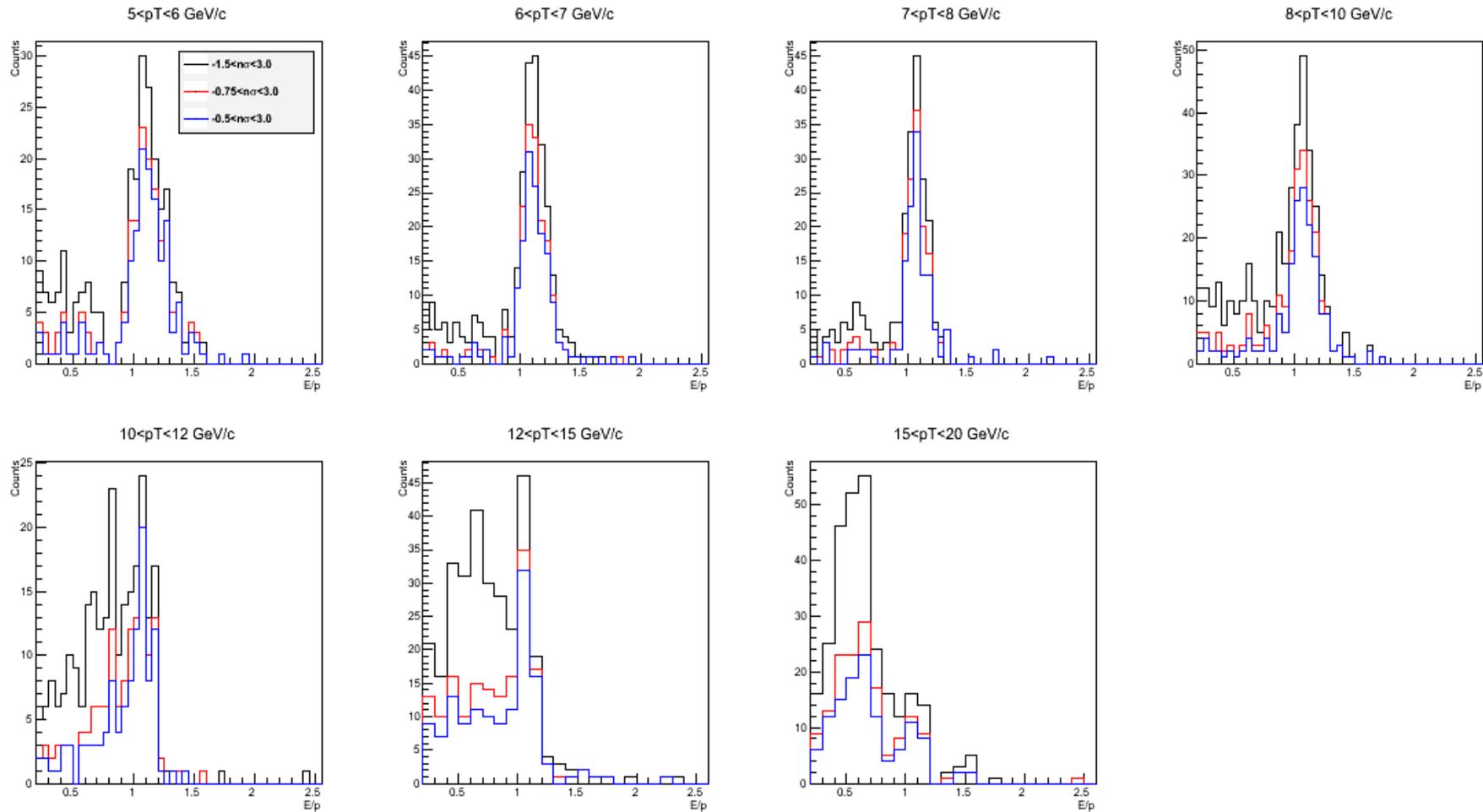
nSigma vs. E/p

- ▶ TPC nSigma and E/p correlation in the most central



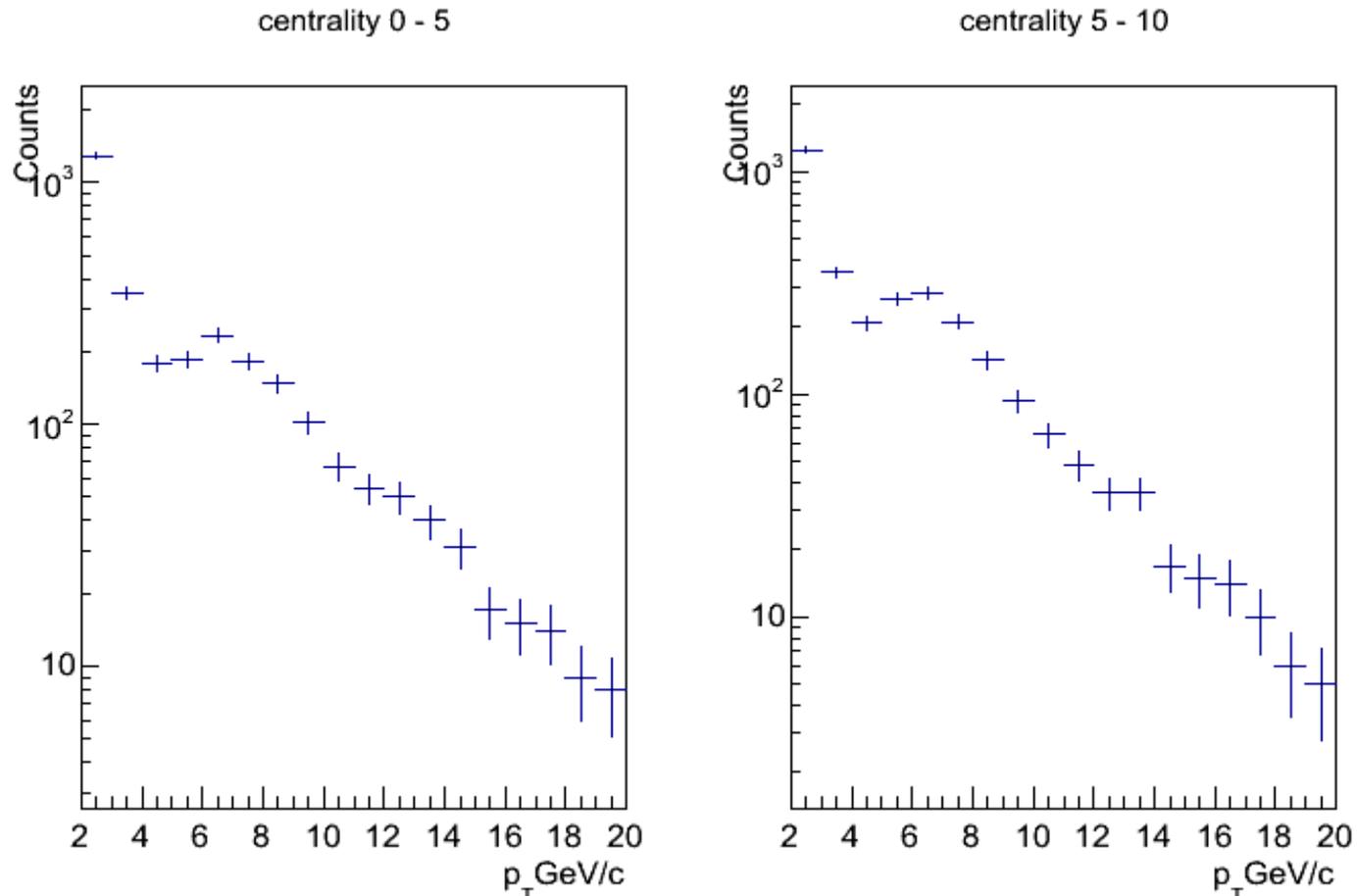
- ▶ Electron signal ; $E/p \sim 1$ & $nSigma \sim 0$
- ▶ Clear hadron and electron separation

E/p distribution in the **most central** collisions with several nSigma cuts



- $N\sigma > -1.5$ reject many hadrons around 10 GeV/c
- $p_T > 10$ GeV/c prefer titer σ cut due to merge of dE/dx bands

Raw electron yields



- nSigma > -1.5
- Not subtracted hadron contamination



Summary & Outlook

- ▶ Looked at Electrons in EMCal trigger (photon trigger) in LHC11 pass2
 - ▶ HFE package on Grid with LEGO train
- ▶ TPC nSigma & E/p correlations
 - ▶ Observed clear electron signal ; TPC nSigma ~ 0 & E/p ~ 1
- ▶ E/p distribution in the most central collisions
 - ▶ Observed clear electron signal above 10 GeV/c
 - ▶ Titer nSigma cut suppress hadron $p_T > 10$ GeV/c
- ▶ Outlook
 - ▶ Further study for the electron identification
 - ▶ Compare with central trigger events

