CASTOR-TOTEM event displays

CMS Collaboration

Abstract

Common CASTOR+TOTEM event displays of electron and charged hadron candidates detected in T2-minus and CASTOR detectors obtained in proton-proton collisions at center-of-mass energy of 2.76 TeV.
CASTOR & T2
Electron and charged hadron candidates
Event displays for approval

Common triggers in 2013 (pA and pp):

- RP related triggers based on tech 52
- tech 53 – T2 MinBias
- algo 99 – CASTOR EM & T2 LowMultiplicity

CASTOR EM:
EM $\text{sec} > \text{thr1}$ and (HAD $\text{sec} < \text{thr2}$ for any sec)

T2 LowMultiplicity:
$N_{\text{trk}} \leq 4\,(2)$ for + or - side
(UPC for pA, resonance->forward e+e- for pp)

=> these triggers are return to TOTEM via L1SA
Performance check using **algo 99** (electrons):

- CASTOR “single” EM sector, total HAD deposition < thr
  only 1 EM sector (mod1+mod2) energy > 15 GeV
  (one of neighbours also allowed to be >15 GeV, but less than E_sum/3)
- single primary track in T2− (TOTEM standard selection)

for a fixed CASTOR sector T2− track distributions:

prove of the trigger performance

solution for CASTOR alignment
Electron candidate based on the above selection:

(TOTEM event display adopted for CASTOR)

CASTOR  T2-

CMS & TOTEM preliminary

Electron candidate
Run 211752/9048
Event 421031219/22

Castor: sector 12, E = 322.624 GeV
(2 neighbour sectors and 3 modules)

T2: \( \phi = -1.90424, \\eta = -5.97295 \).
Charged hadron candidate based on T2 MinBias

(TOTEM event display adopted for CASTOR)

Selection:
- localized HAD energy above a threshold,
- low corresponding EM energy
- corresponding T2- track

CMS & TOTEM preliminary

Run 211752/9047   Event 281708122/144817

Castor:  central (most energetic) sector 9
E=205 GeV (sectors 8,9,10)
T2:  phi=-2.935; eta=-5.69
Displays for approval
Electron candidate
Run 211752/9048
Event 421031219/22
CMS & TOTEM preliminary

Electron candidate
Run 211752/9048
Event 421031219/22
Charged hadron candidate

Run 211752/9047  Event 281708122/144817
Charged hadron candidate

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