Validation of the TAU Triggers

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Trigger Validation Module

Call

Lepton+track trigger/dataset validation is a part of tau trigger/dataset validation.

- **TauTriggerValidation:**
  - **CEM8Track5Validaiton**
  - **CMUP8Track5Validation**
  - **CMX8Track5Validation**
  - **TauMetValidation**
  - **DiTauValidation**

BaseTauTrigger Validation

- **Code validation with recent data was done.**
- **Deposited on ExoticMods/Validation.(v4.5.0)**

Written by ***lepton-track trigger*** group

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TAU_ELECTRON8_TRACK5_ISO Path

- **Level 1:**

  L1_CEM8_PT8

- **Level 2:**

  L2_CEM8_PT8

- **Level 3:**

  L3_ELECTRON8_TRACK5_ISO

Definition of efficiency

1) Select events with back-up path bit

e.g. ELECTRON_CENTRAL_4 (CEL4)

2) Apply offline cuts relevant to

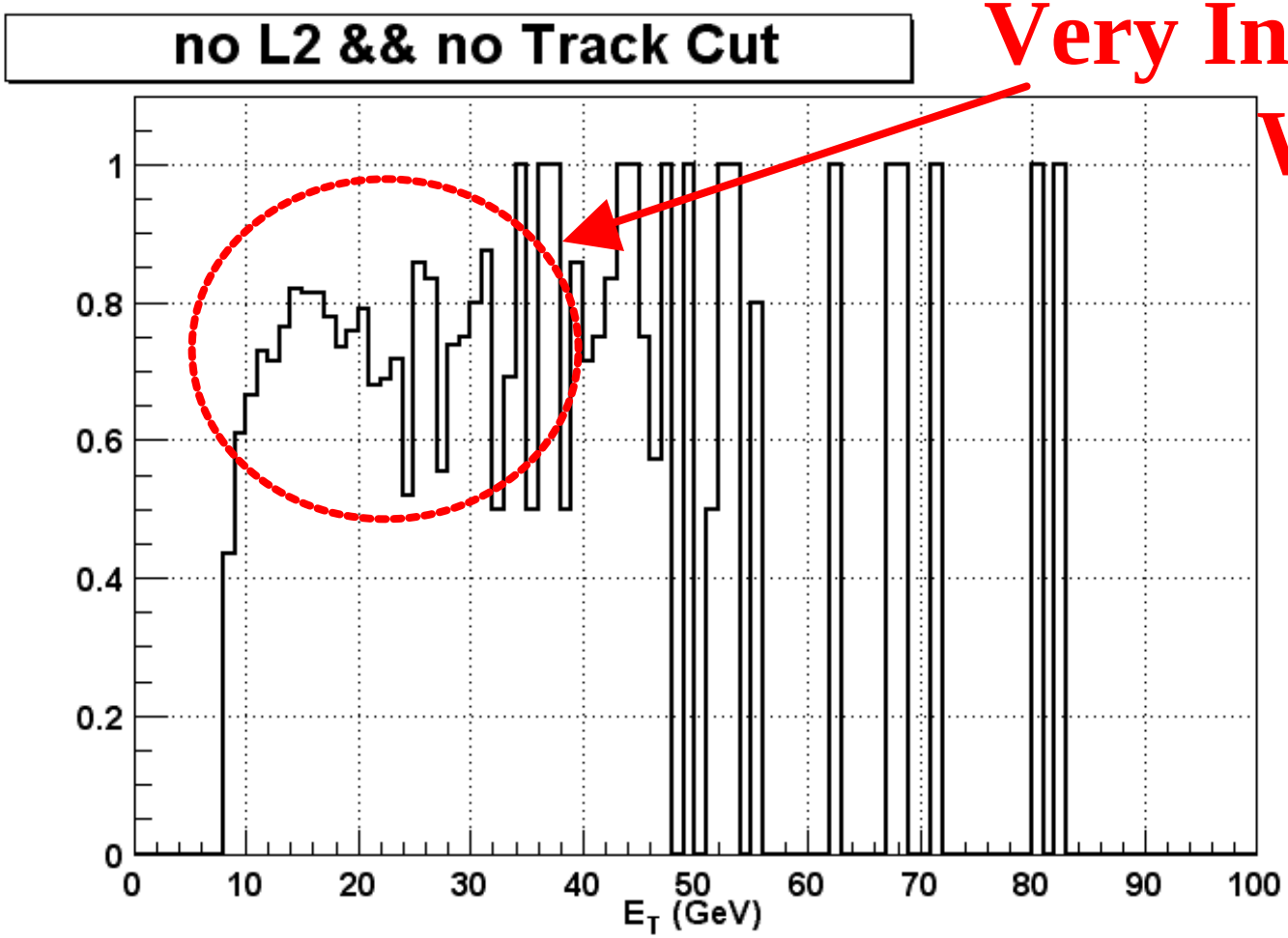
TAU_ELECTRON8_TRACK5_ISO (EL8TRK5)

3) Check EL8TRK5 bit after cut

We define

Eff. = (1& 2& 3) /(1& 2)

Inefficiency of EL8TRK5



Very Inefficient!!

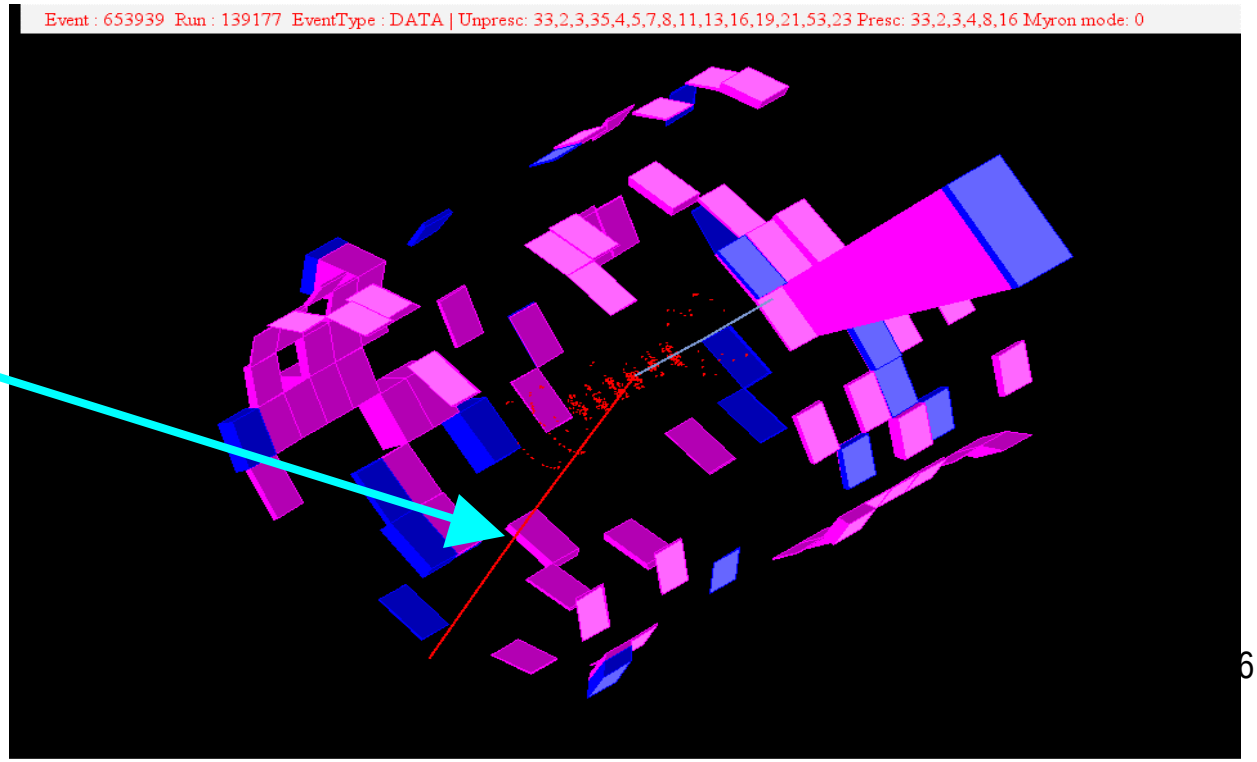
Why??

Problem

- Large fraction of such events also don't have L2_CEM8_PT8.(so didn't process this trigger at L3)
- Some events have track with large eta (>1.2) or no COT hits.

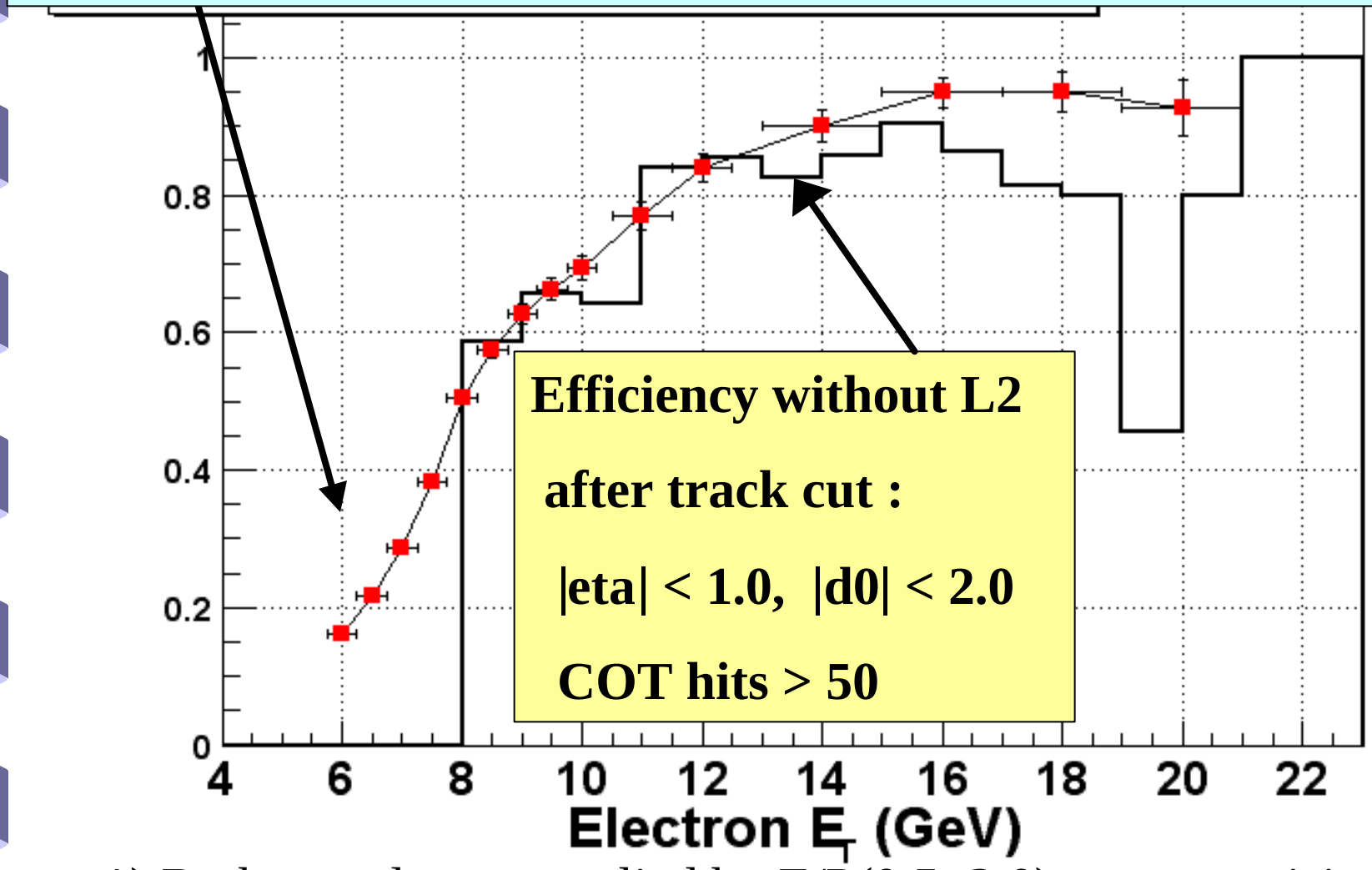
Pt = 5.5 GeV

Eta = -1.21



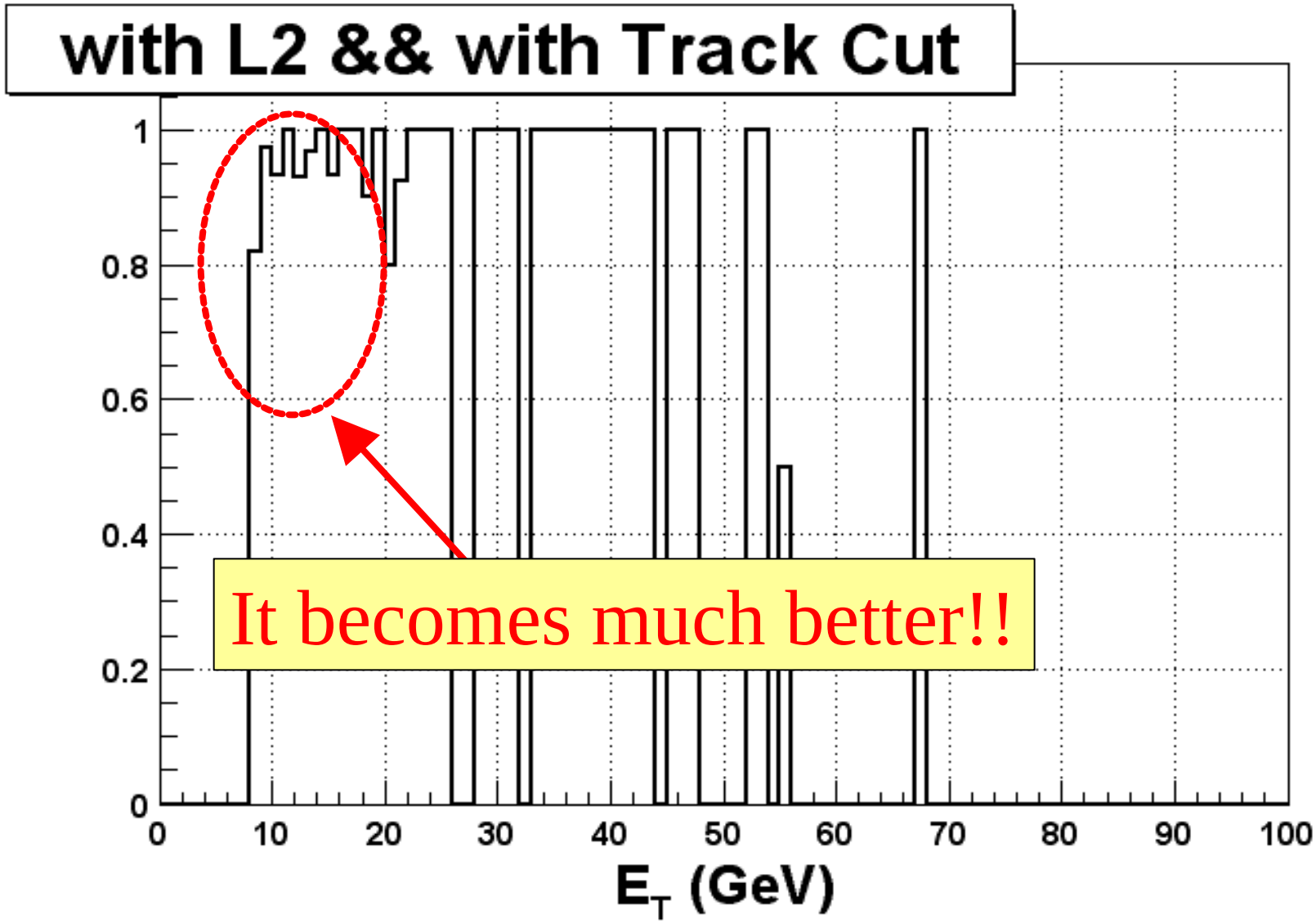
Problem (cont.)

(ELE4 & offline cut & L2_CEM8_PT8) / (ELE4 & offline cut)



*) Both samples are applied by E/P(0.5~2.0) as prerequisite.

Efficiency after Prerequisite



Look at Z ? e + tau_h

Luminosity

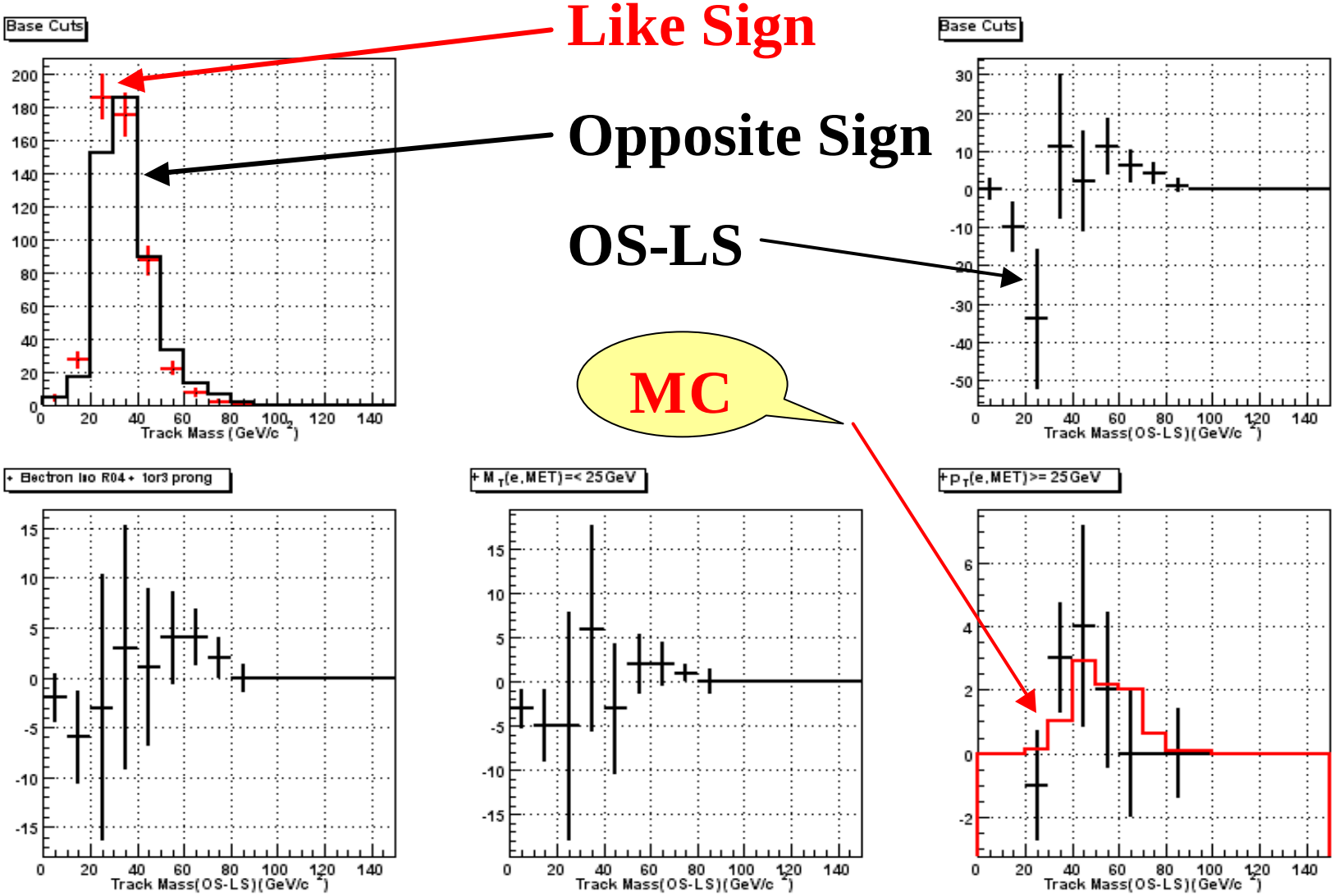
Dec.-Jan. : 2.7 pb^-1

Feb.4- Apr.26 : 11.8 pb^-1 (online luminosity)

Cf.) CDF Note 5251

- **|PrimVtx| < 60cm**
- **(M_T(e,MET) < 25 GeV/c2)**
- **(p_T(e,MET) > 25 GeV/c2)**

Base Cuts for e and tau_h

Electron	Tau
Et > 10 GeV	Cluster Et > 10 GeV
Pt > 8GeV/c	Track Pt > 8 GeV/c
|Eta| < 1.1	|Eta| < 1.0
|Z0 – Z0vtx| < 10.0	|Z0 – Z0vtx| < 10.0
0.5 <E/P < 1.8	Track Mass < 2.0 GeV/c2
Lshr < 0.2	Calo Mass < 4.0 GeV/c2
Had/Em < 0.055+0.00045 x E	EM frac. < 0.95
Chi2strip < 10.0	If 1 prong && Et/Pt < 4,
? Z < 3.0	EM frac. < 0.9
? X < 1.5	Track Iso. < 1.0 GeV, no 10~30deg
(Iso R0.4 < 4GeV)	(1or3 prong)

Track Mass of Z? e+tau_h