

SusyAnalyzer vs. PAT

- IPM@CMS



Electron ID

- 2 Different variables for electron ID :
 - Sigma Eta Eta
 - Sigma iEta iEta
 -
- Sigma Eta Eta needs a correction in EndCap region :

if (fabs(eta) >= 1.479)

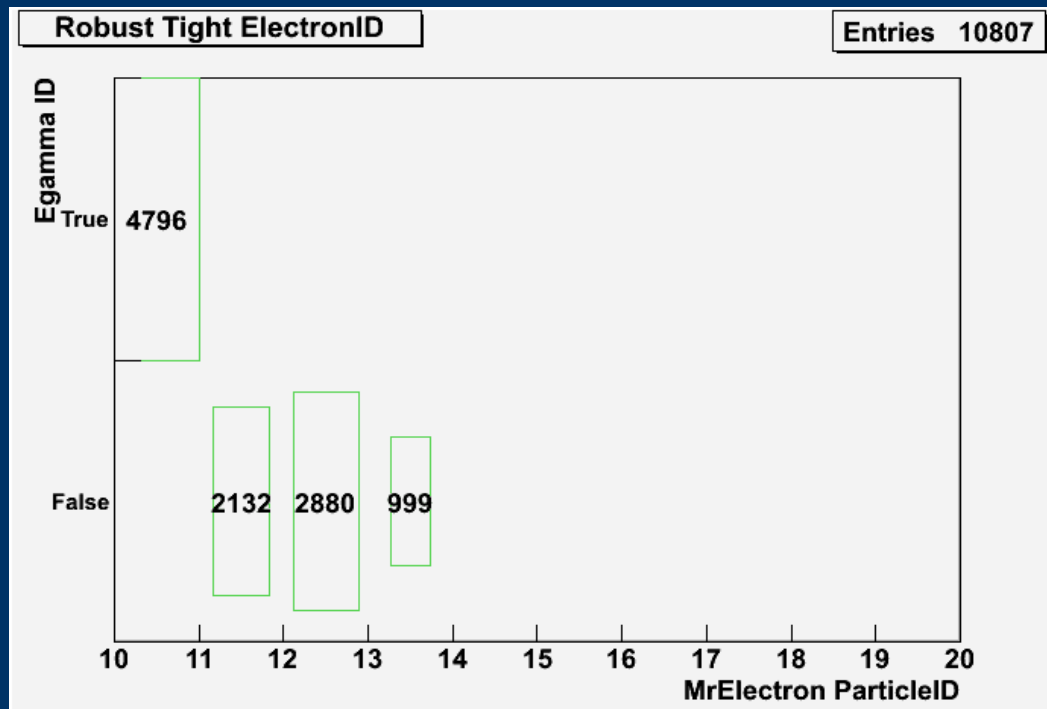
 sigmaee = sigmaee - 0.02*(fabs(eta) - 2.3);

Electron ID

- I found that in SusyAnalyzer SigmaIEtaIEta is being used, while in standard identification SigmaEtaEta (From CMSSW_3 they will use the new variable)
- A bug in SusyAnalyzer :
 - The correction needed for old variable is applied on SigmaIEtaIEta !!

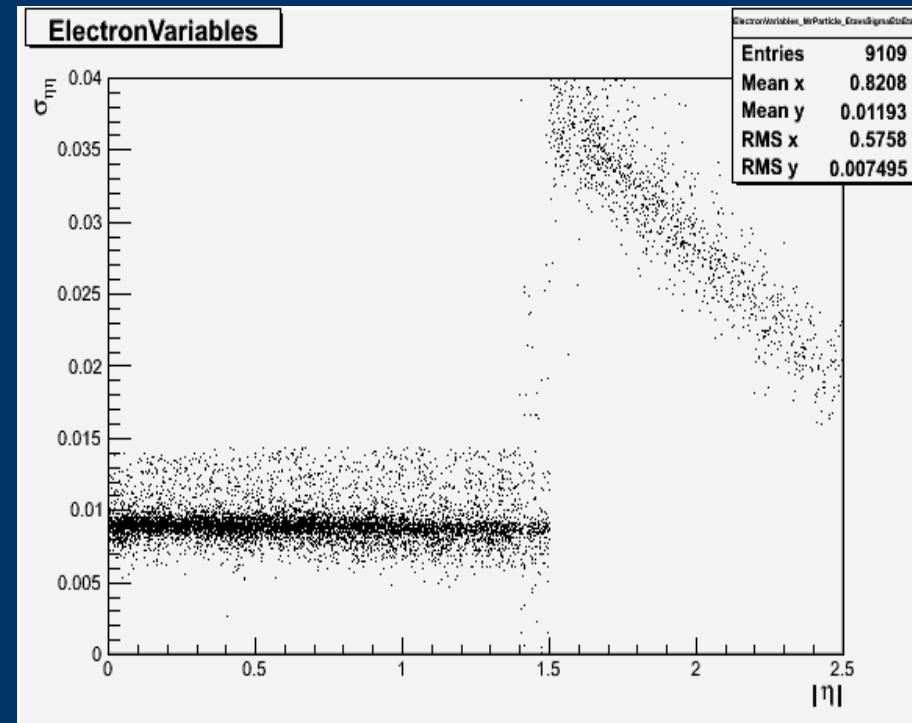
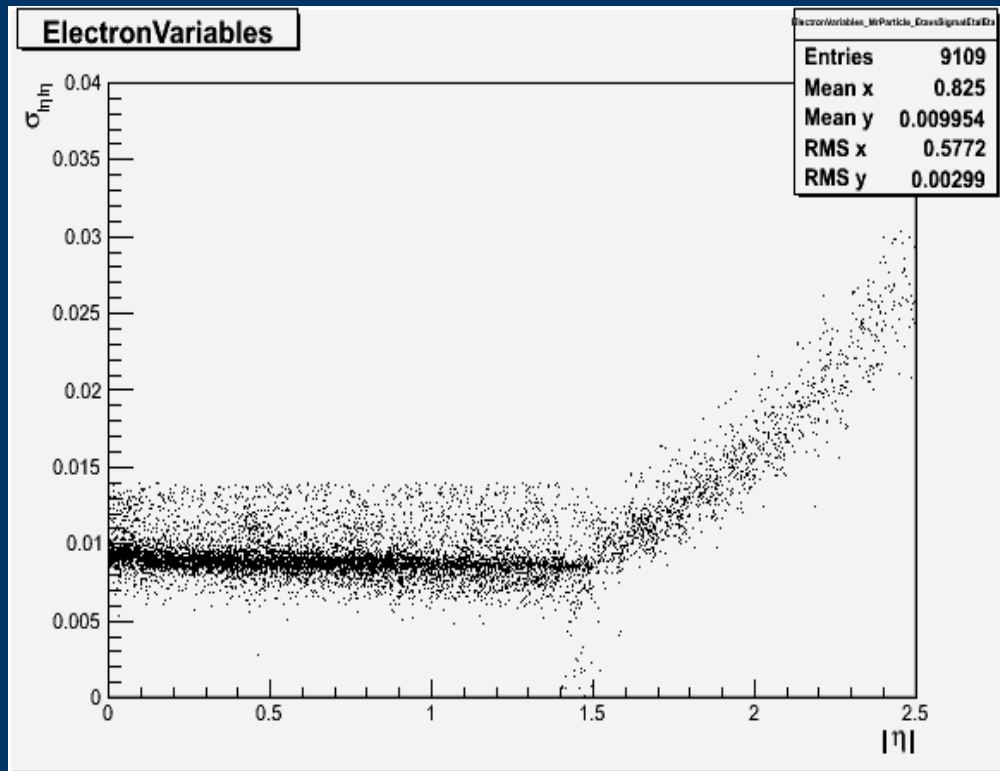
Electron ID

- After forcing SusyAnalyzer to use SigmaEtaEta, a complete agreement with POG ID is achieved :



More deeper on SigmaEtaEta maybe a bug in POG Electron ID

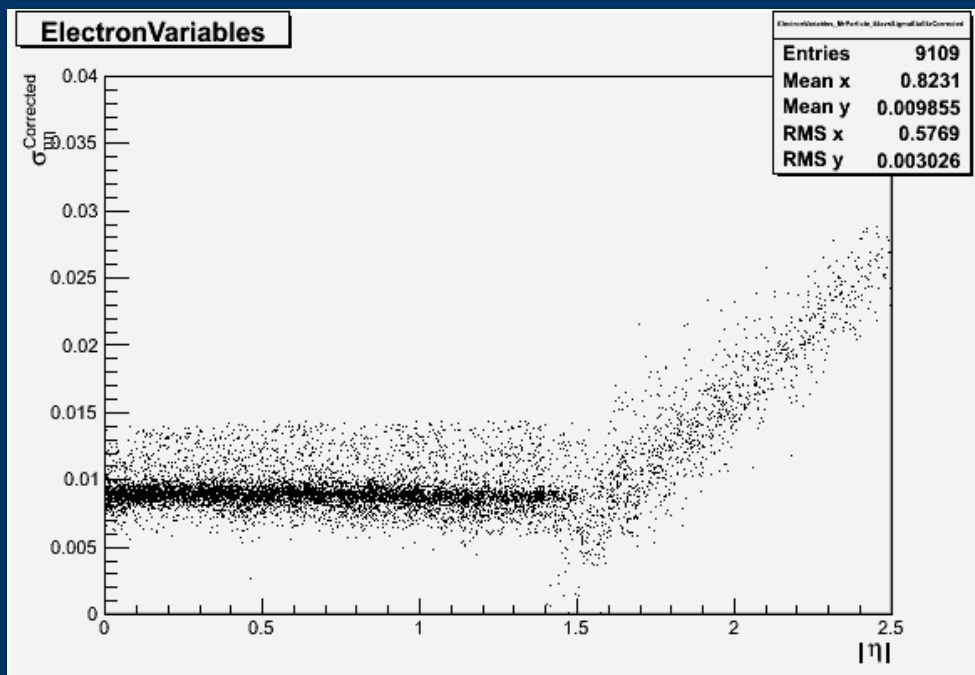
- Is the correction correct ??



The negative slope is obviously
from the formula used

A correct correction :

- This correction can be better :
if $(f_{abs}(\eta) \geq 1.479)$
 $\sigma_{\eta} = \sigma_{\eta} + 0.02 * (f_{abs}(\eta) - 2.3);$

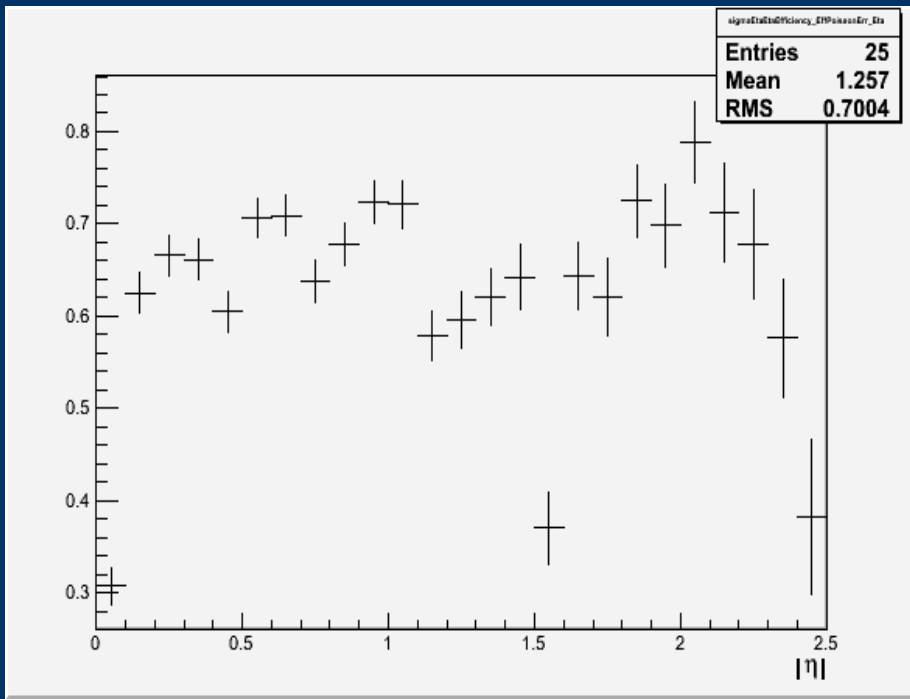


Now it is more similar to
SigmaIEtaIEta

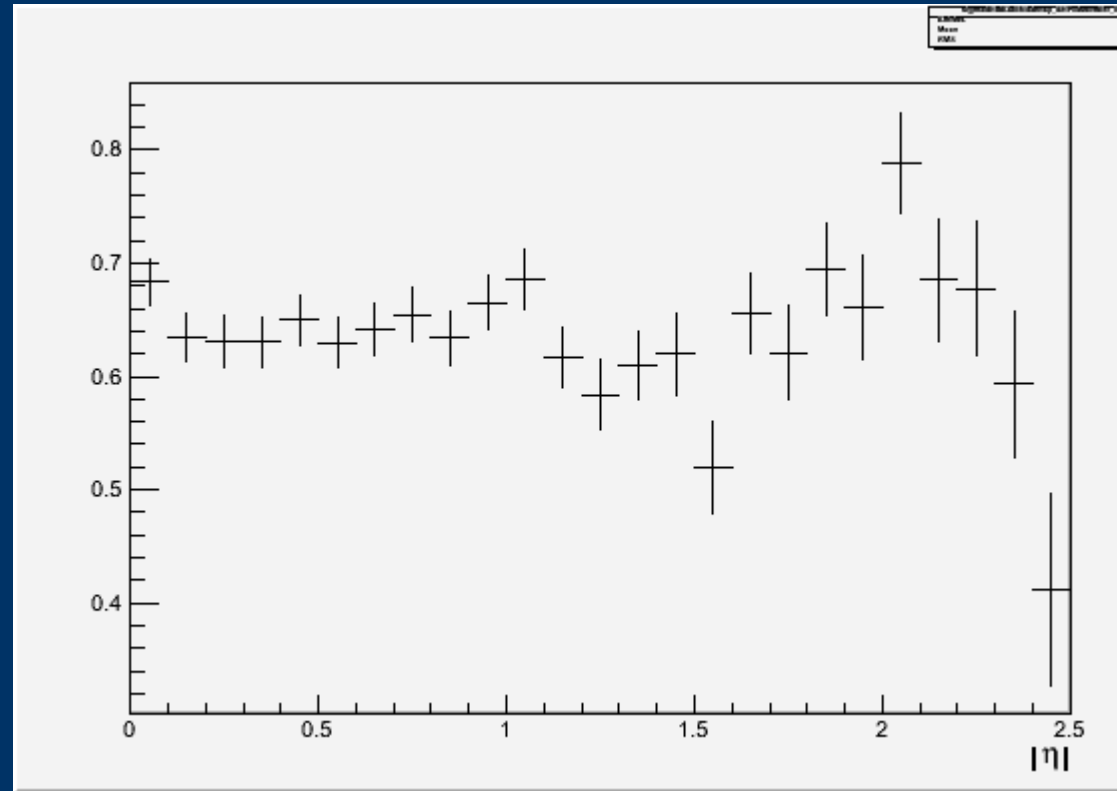
Sigma Eta Eta

- To verify which variable works better, the efficiency of electron ID vs. Eta is plotted.
 - Efficiency is :
All Identified(Robust Tight) and Isolated electrons which have a matched gen-particle divided by the number of Isolated Electrons with a matched gen-particle.
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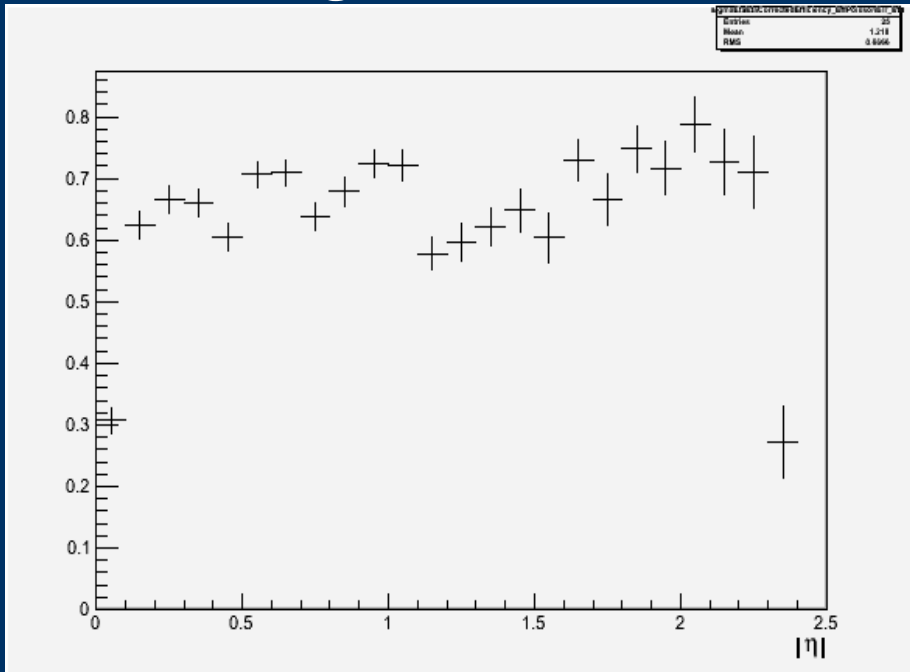
SigmaEtaEta



Sigma IetaIeta :

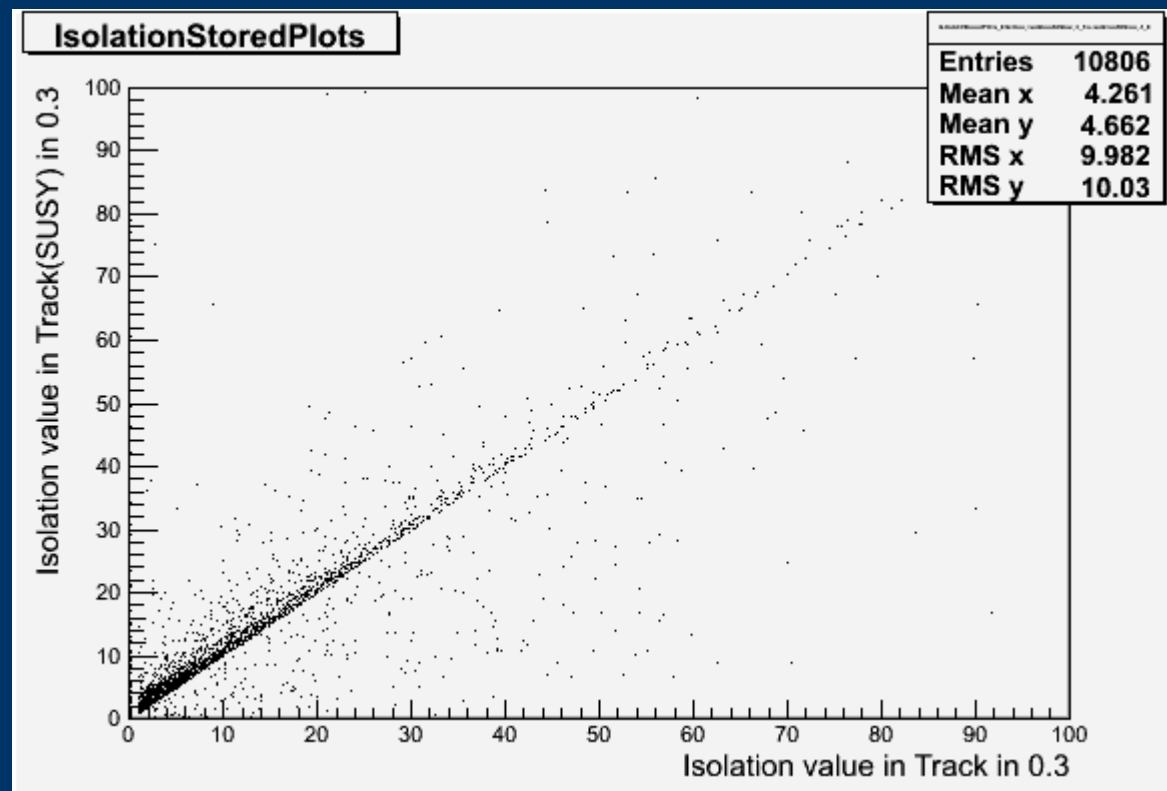


Corrected SigmaEtaEta



Electron Isolation

- In tracker, there is a good agreement between SusyAnalyzer and POG algo:



Electron Isolation

- In calorimeter, SusyAnalyzer uses calotowers, while POG recommendation is Hcal and Ecal rechits. But the plot below shows a good agreement between them :

