

Update on Calibration Activity

D.Banfi



Calibration activity for the next weeks:

- COM note has been submitted --> working on referee comment to make it INT. Maybe a PUB note will be extracted from the INT one. Luciano is the Editor of all these notes...
- Calibration of region of the calorimeter with a missing sampling read-out (more details later on): proposed method seems to work quite well, we are discussing with egamma people on how to better implement it inside Athena
- Study of low energy photons calibrations: try to extend Cluster Calibration to very low energy photons ($E < 5\text{GeV}$) and not only producing a Pi^0/Eta dedicated calibration.
- Study of the performance of the CaloCluster Calibration on simulation with different geometries (19 different tag): Ruggero will start working on this to become familiar to Cluster Calibration as soon as data will be available
- Complete review of the code for processing Hit File : big amount of technical job (done mostly by Leonardo) required to make our old code work on newer simulations
- Complete review of the code for extract CaloCluster Correction, for make it more general and easy to use (thanks to Ruggero for his help!)

“The measurement of the energy of electrons and photons in the ATLAS electromagnetic calorimeter”

D.Banfi, L.Carminati, J. del Peso, N.Kerschen, L.Mandelli, D.Nebot, E.Paganis

ATL-COM-PHYS-2010-068

The performance of Calo Cluster Calibration are tested on single particle simulation, electrons and photons, with energy from 5 GeV to 1 TeV, simulated with 14.1.0.2 and reconstructed with 15.3.1.6 and ATLAS-GEO-05-00-00 (tag s439).

Both Calibration Hits and Longitudinal Weigh have been used (v6_calh and v6_lwc). Calibration coefficients are tested for:

- electrons
- converted photons : reconstructed conversion at $r < 800\text{mm}$
- unconverted photons : no conversion reconstructed at $r < 800\text{mm}$

Results are presented for clusters that pass the tight selection (*) :

- Barrel Region : 3x7 for electrons and converted photons, 3x5 for unconverted photons
- Endcap Region : 5x5 for all particles type

Symmetry in azimuth and in pseudorapidity with reference to the ATLAS center is assumed

(*) In Athena are available calibration coefficients for 3x5, 3x7, 5x5 for all particles and calorimeters.



ATLAS NOTE
February 8, 2010



The measurement of the energy of electrons and photons in the ATLAS electromagnetic calorimeters

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Abstract

In the present note the performance of the ATLAS electromagnetic calorimeters in measuring the energy of electrons and photons are summarized. Two different algorithms are used: the “calibration hit” and the “longitudinal weight” and the results are compared.

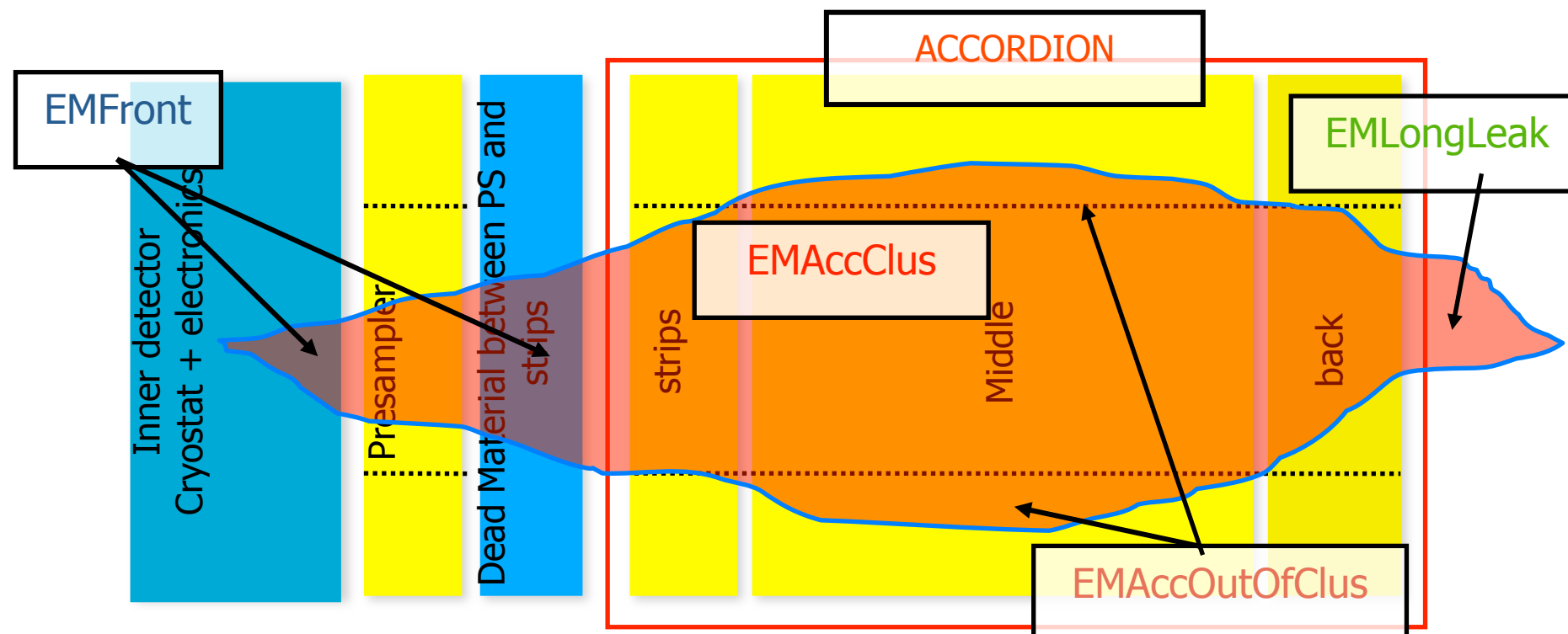
Calibration of region with Dead OTx

Some (18 by now...) of the OTx (optical transmitter located on the LArg FEB) are not working: this imply that regions of the detector are not read-out.

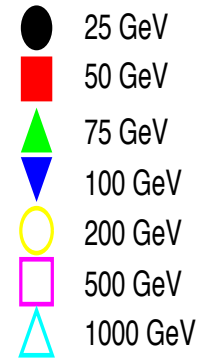
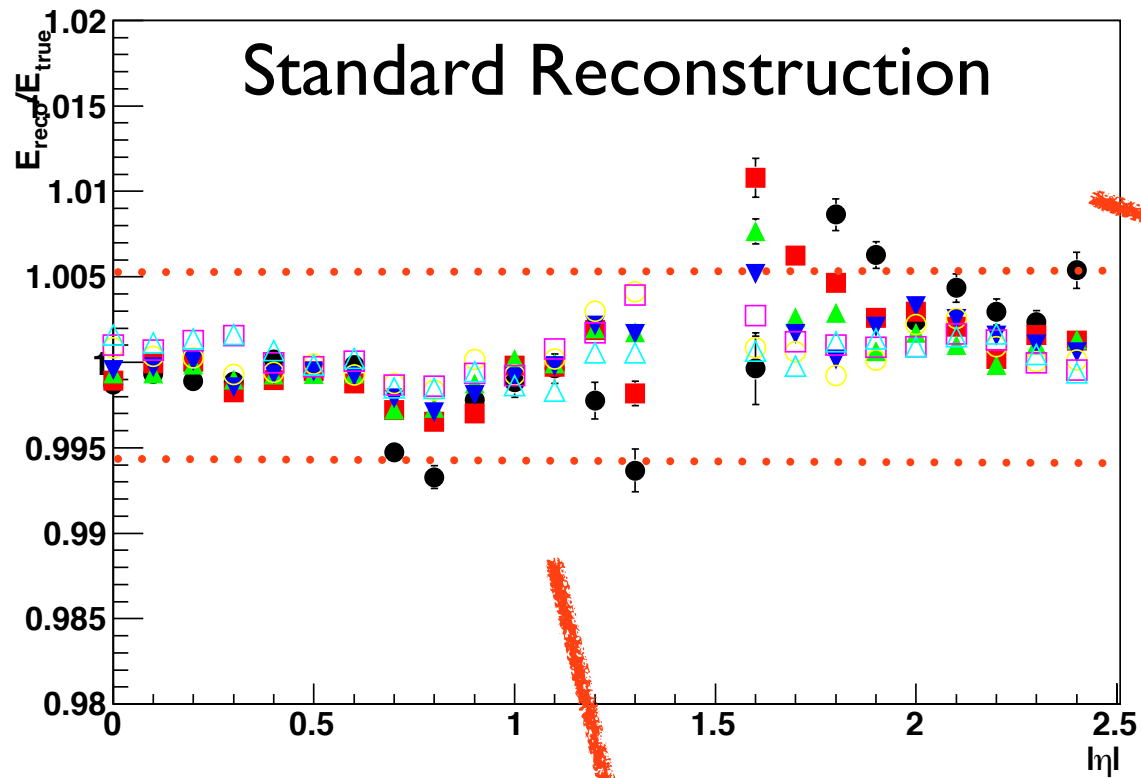
Possible scenario:

1. No Strip or Middle : cluster calibration is not recovered
2. No PS: reconstruction of the energy deposited in front is parametrized as a function of the longitudinal barycenter (like we already do for region $|η| \geq 1.8$)
3. No Back: reconstruction of the E behind the middle layer is performed with as a function of the longitudinal barycenter (like the present longitudinal leakage correction)
4. No PS & No Back : 2 + 3

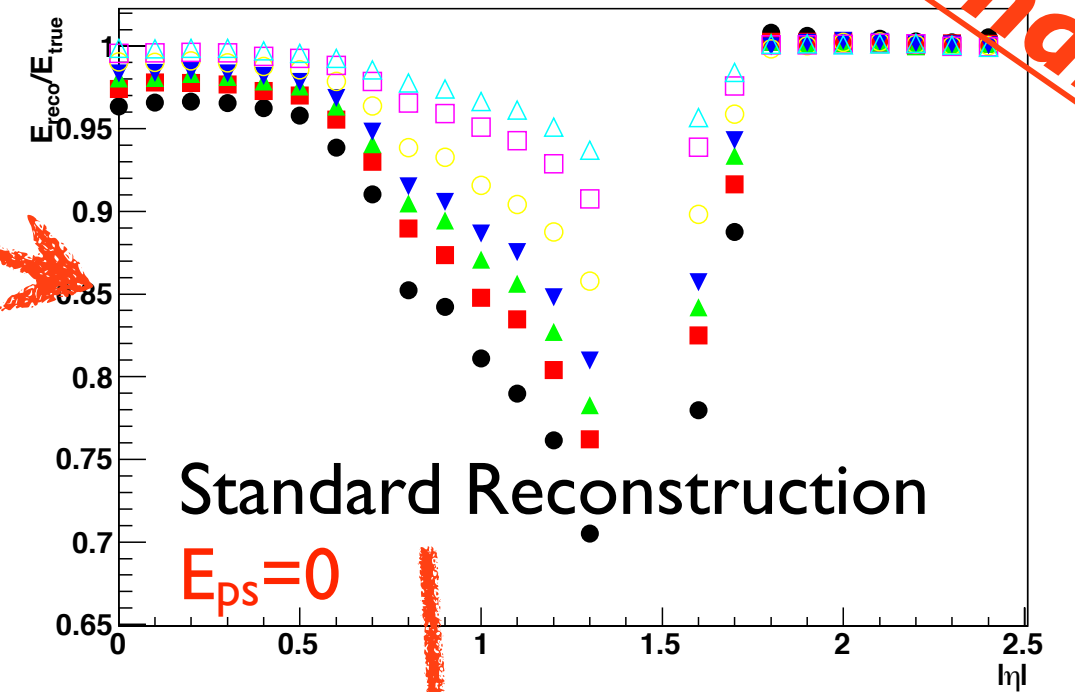
Coefficients need to be provided for all 3 configuration (multiply by particles and cluster size...).
At present no modification to Accordion and Out of Cluster parameters is computed.



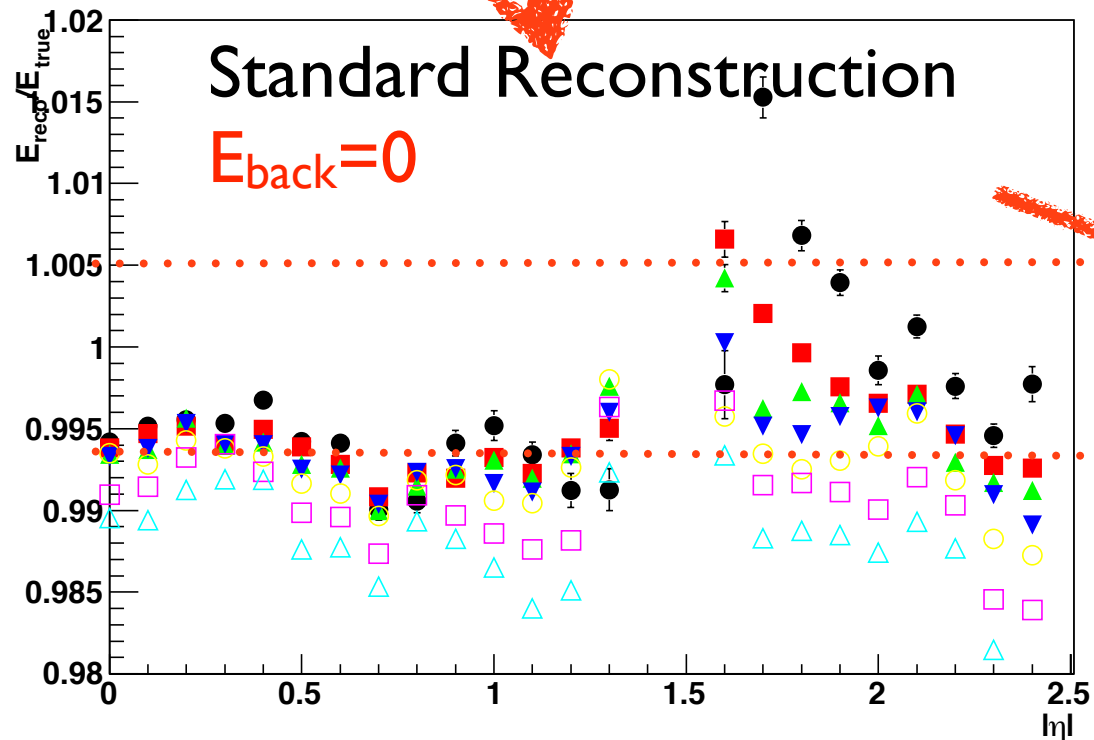
Linearity



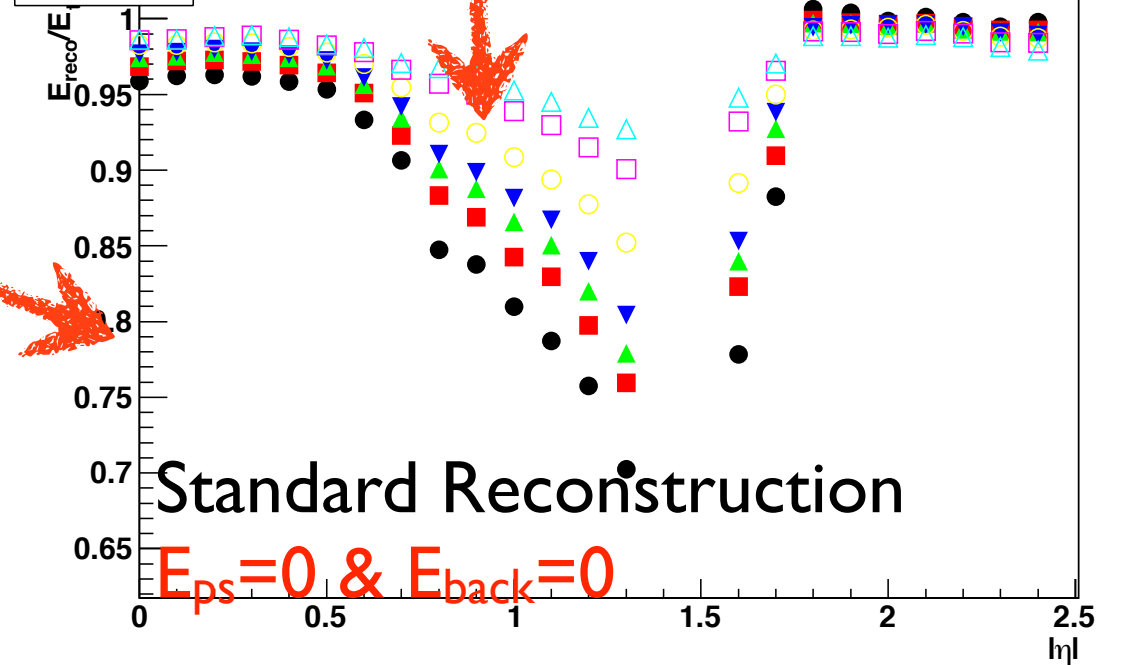
Linearity



Linearity

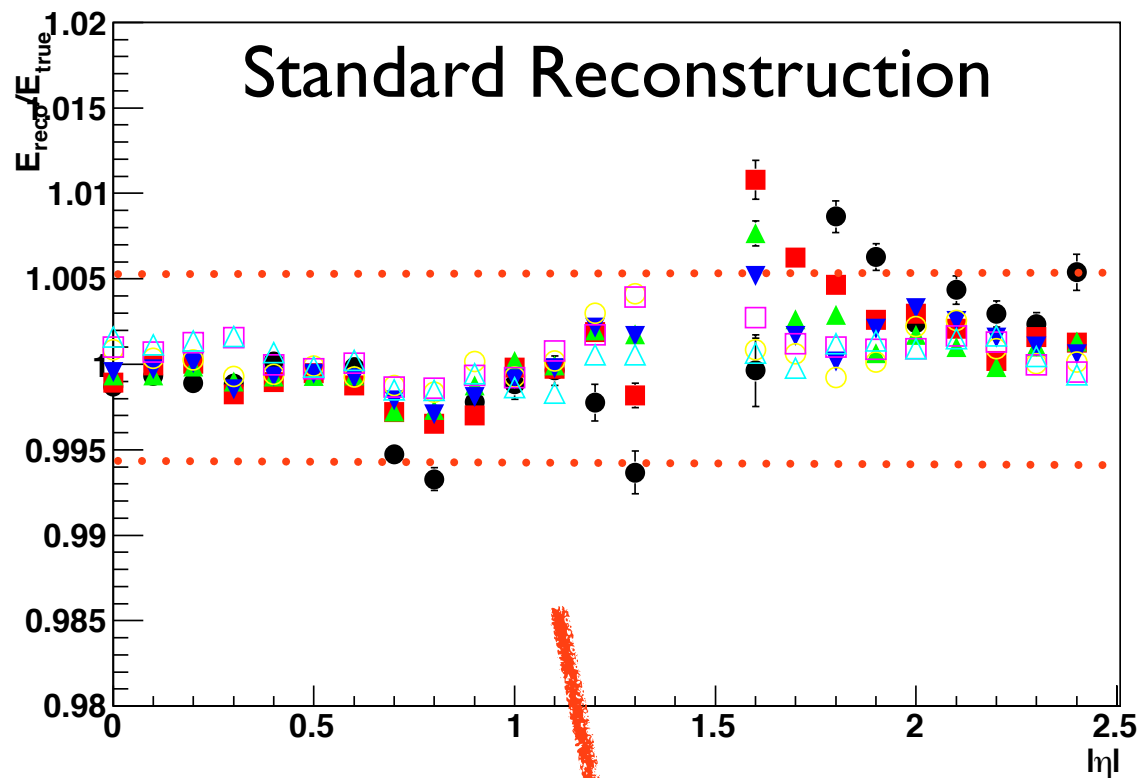


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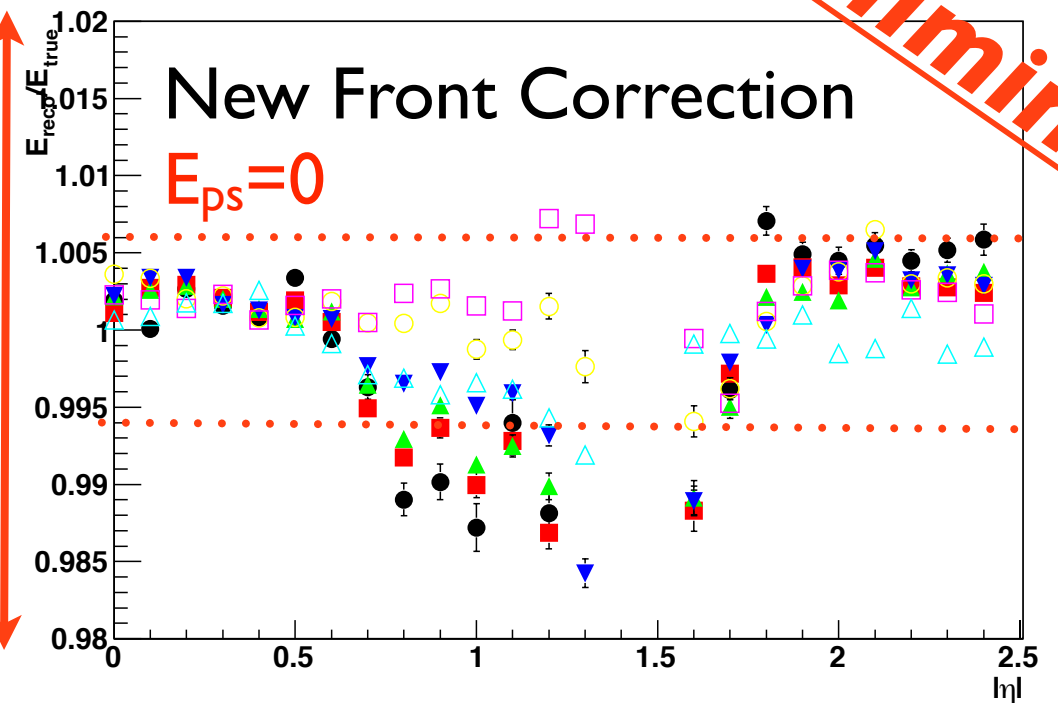


Preliminary

Linearity

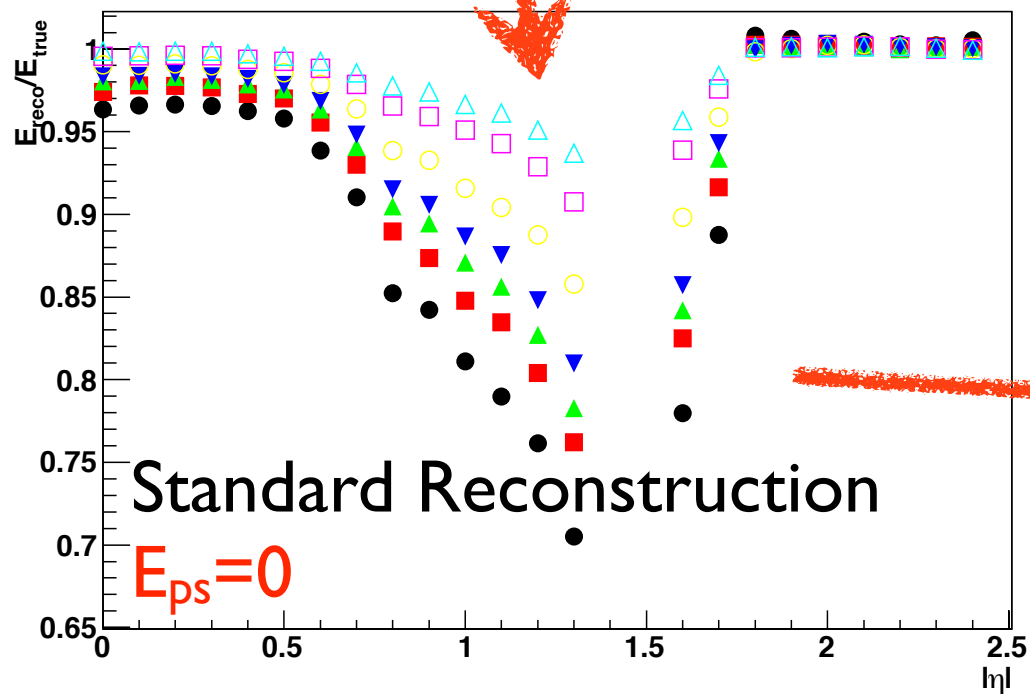


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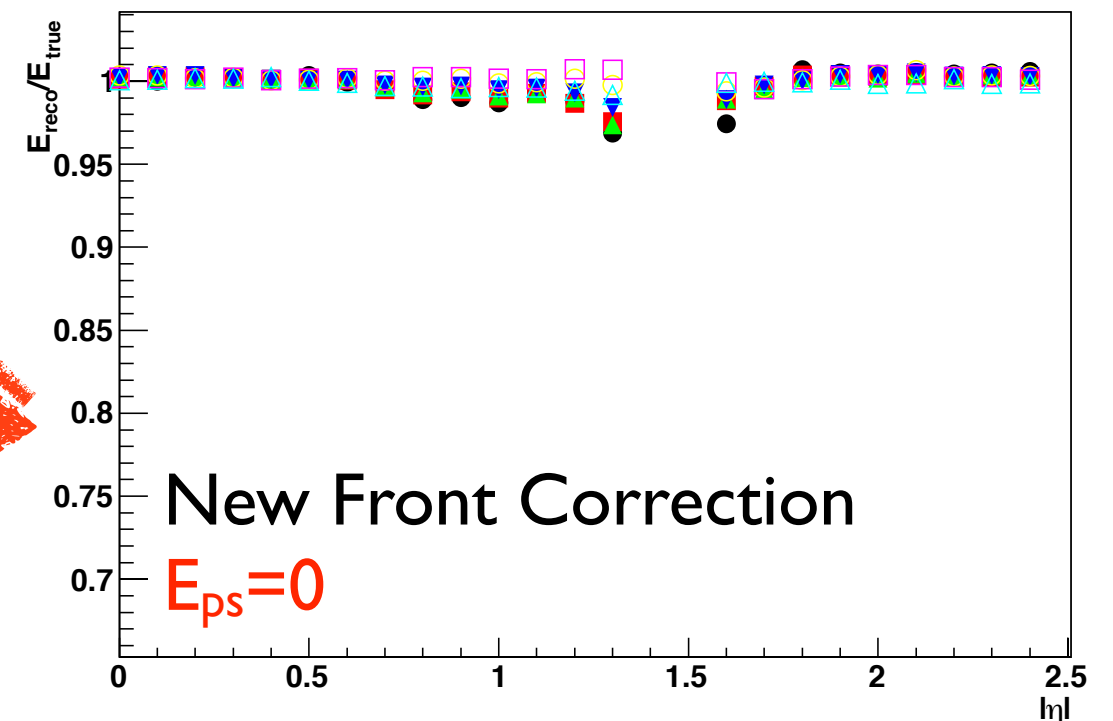


Zoom

Linearity

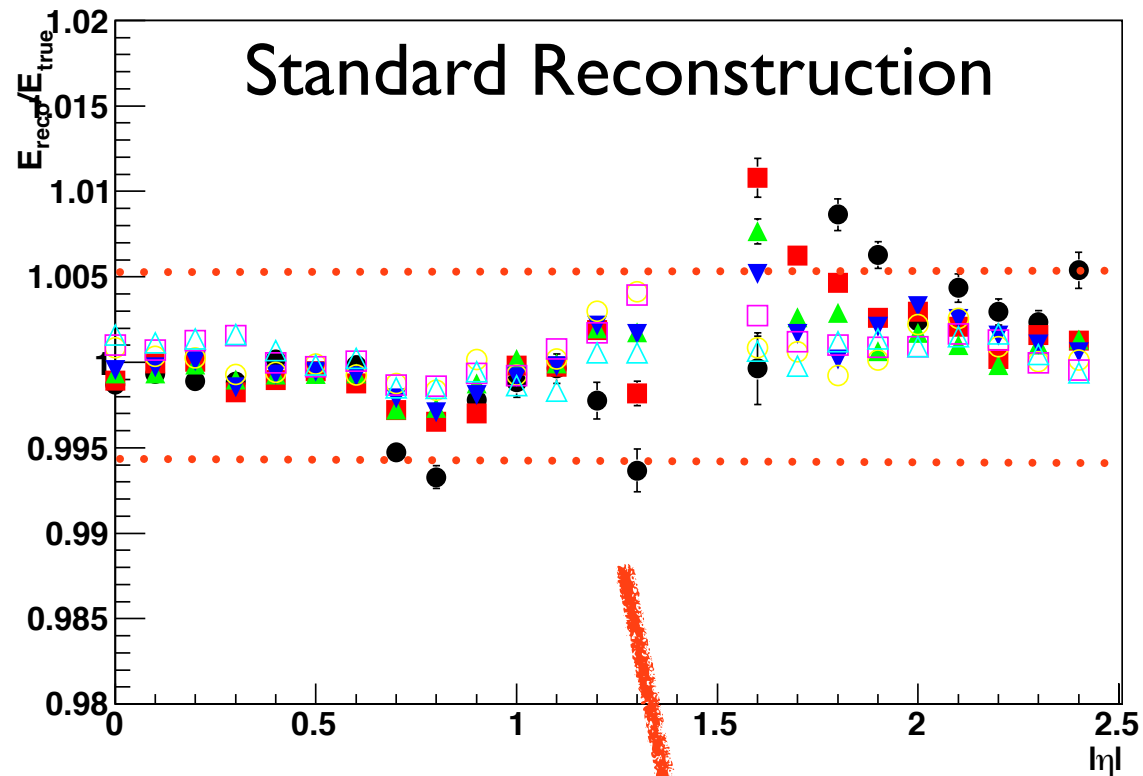


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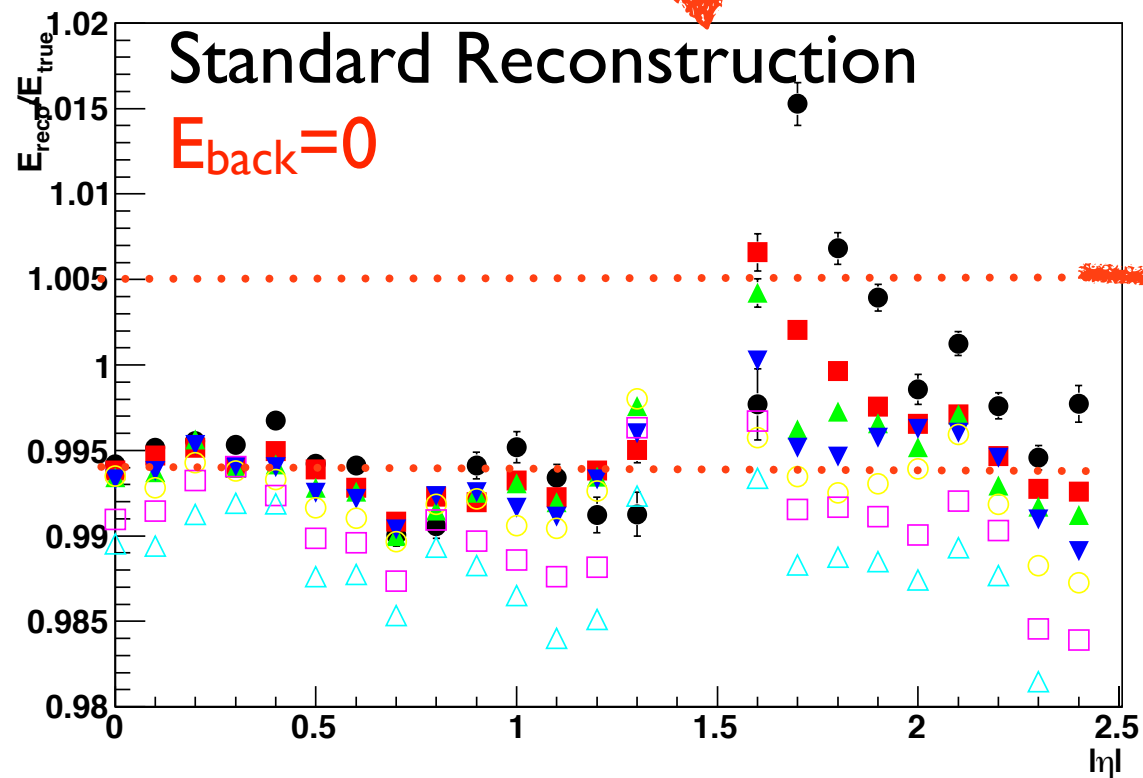


Preliminary

Linearity



Linearity



Linearity

