Intermediate report

Study of continuous electron identification with the ATLAS-Detector

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HELMHOLTZ ASSOCIATION

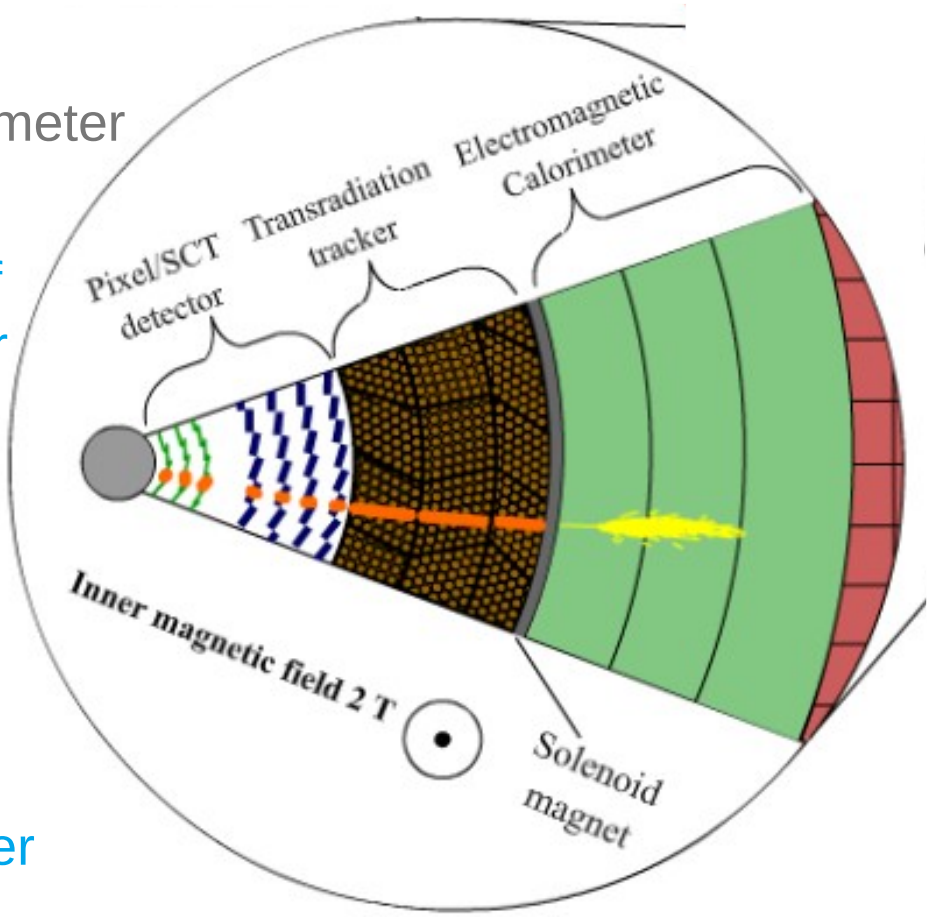
DESY

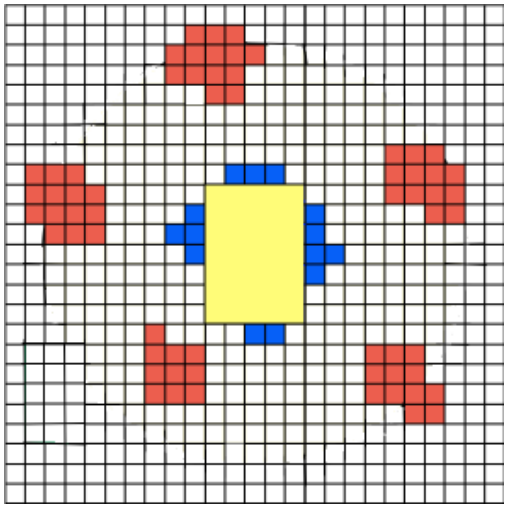
Electron identification

> Reconstruction of electrons in the ATLAS detector:

- tracks in inner detector
- Electromagnetic (EM) calorimeter

profile of
ATLAS-detector

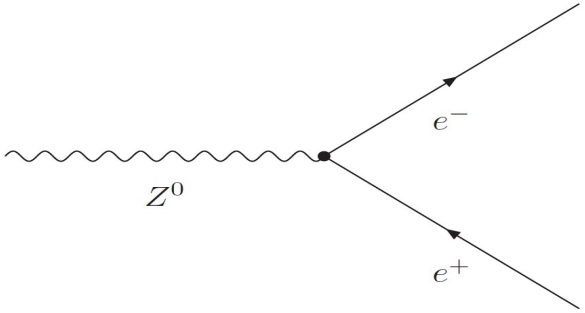




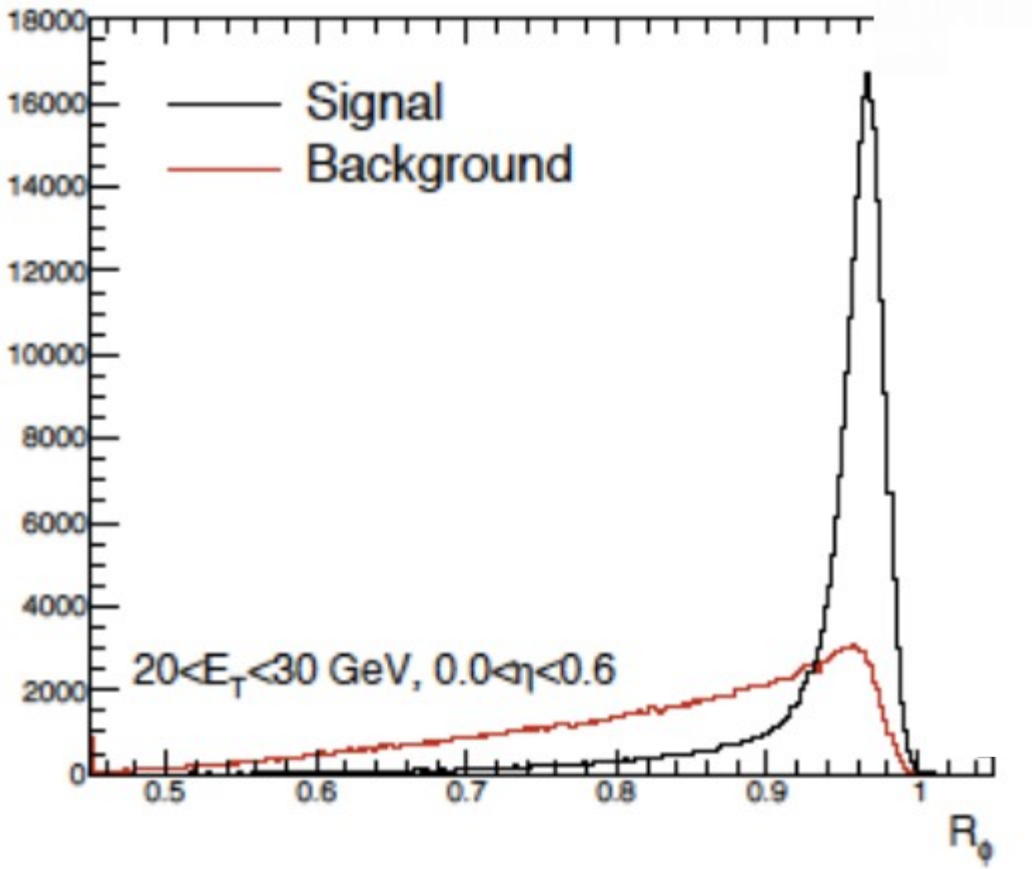
cluster in
EM calorimeter

Electron identification

- Signal process



- Background processes
  - Photon conversation
  - B decay
  - 2 Jets
- Cuts to optimise identification
  - On track
  - Cluster-properties in EM calorimeter

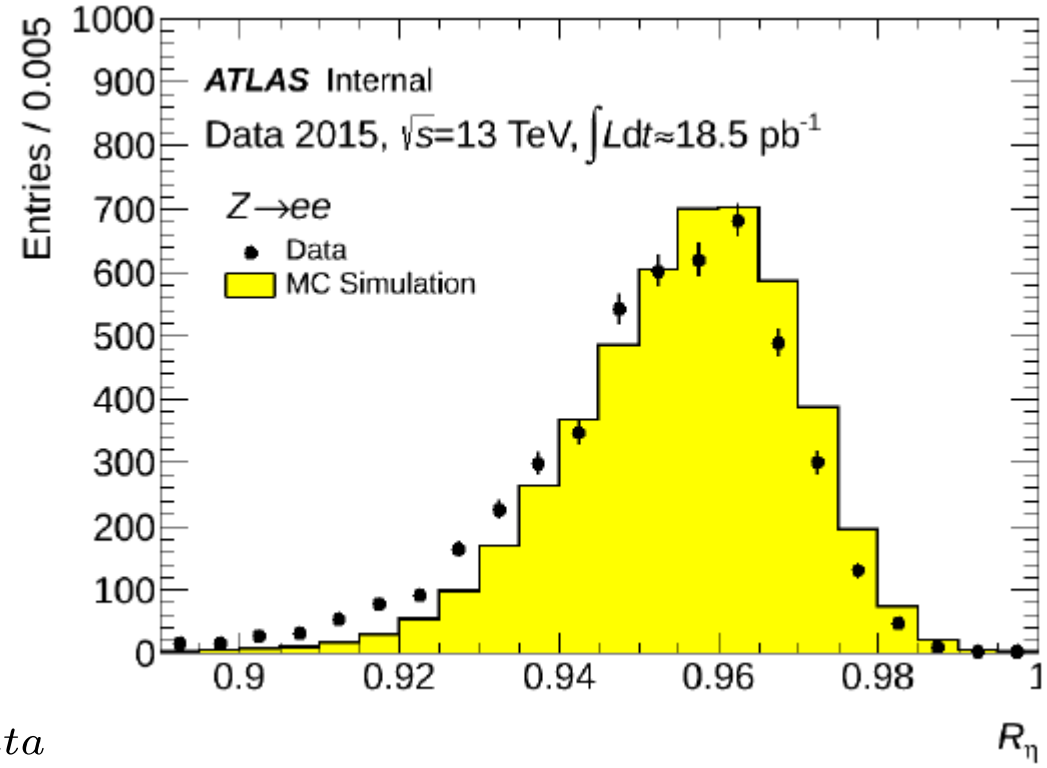


Efficiency

Method to check how well identification work:

> Efficiency $\epsilon = \dfrac{\text{electrons which pass cuts}}{\text{all electrons}}$

- Shift in shapes for MC Simulation and Data

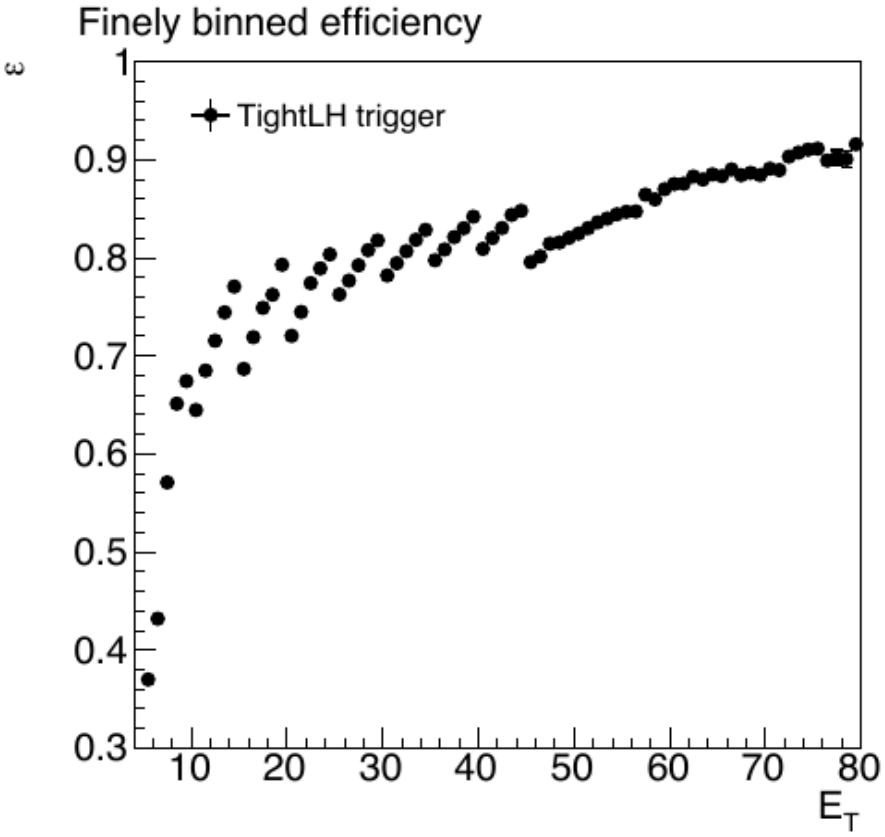


> Scale factor $\mathrm{SF} = \dfrac{\epsilon_{Data}}{\epsilon_{MC}}$

DESY

Problem

- Discontinuities in identification binning causes discontinuities in data, MC, efficiency, scale factors, …



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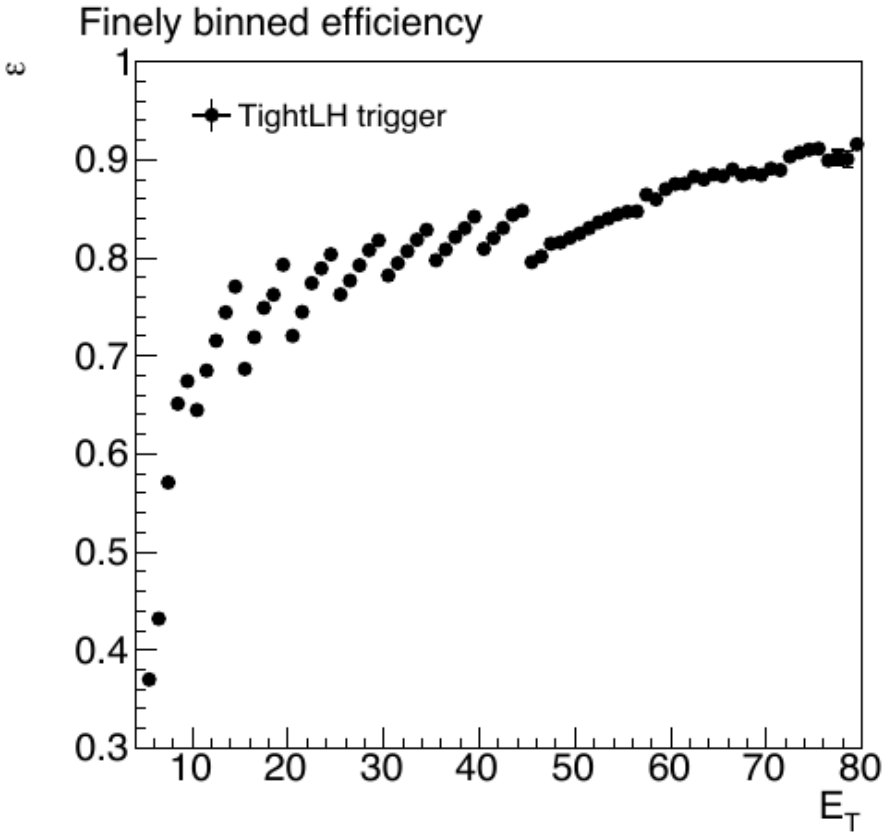

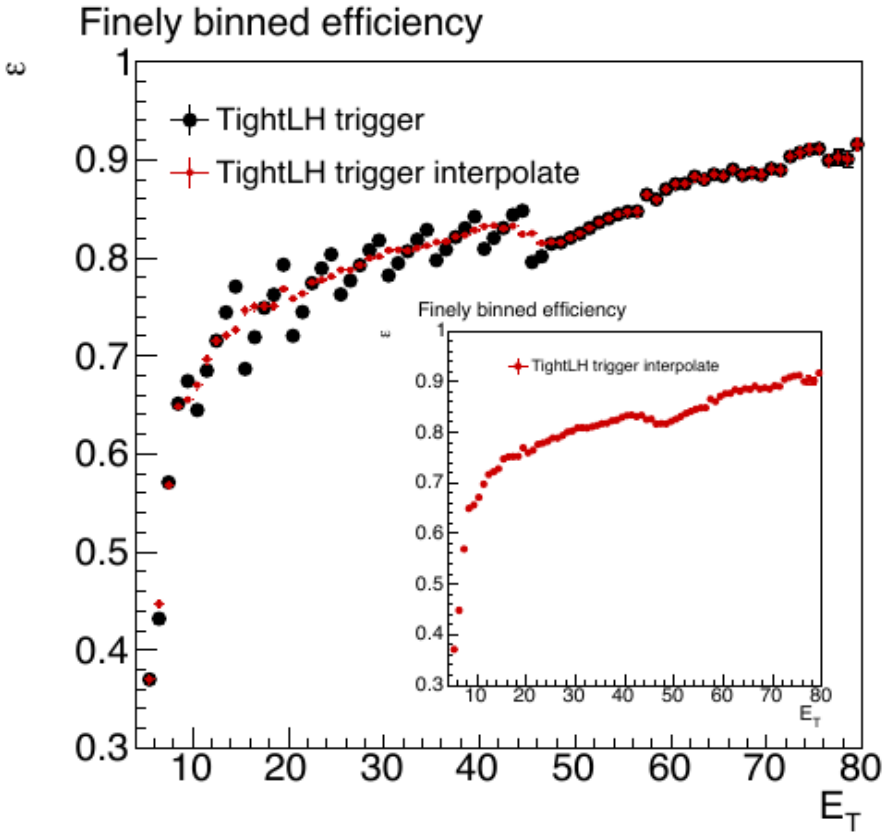

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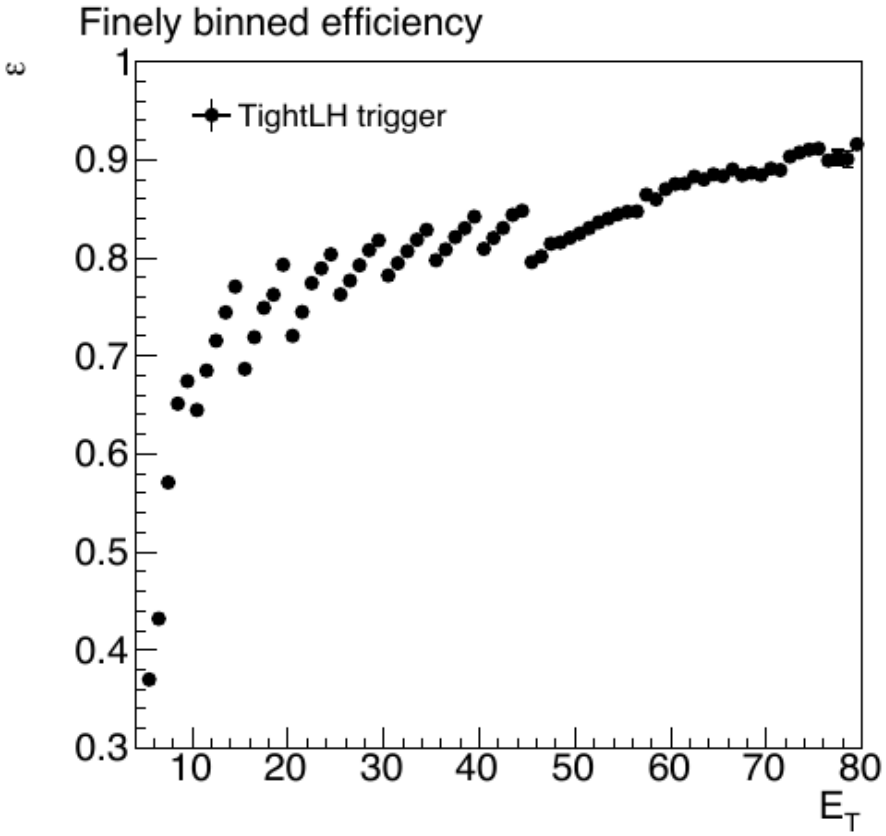

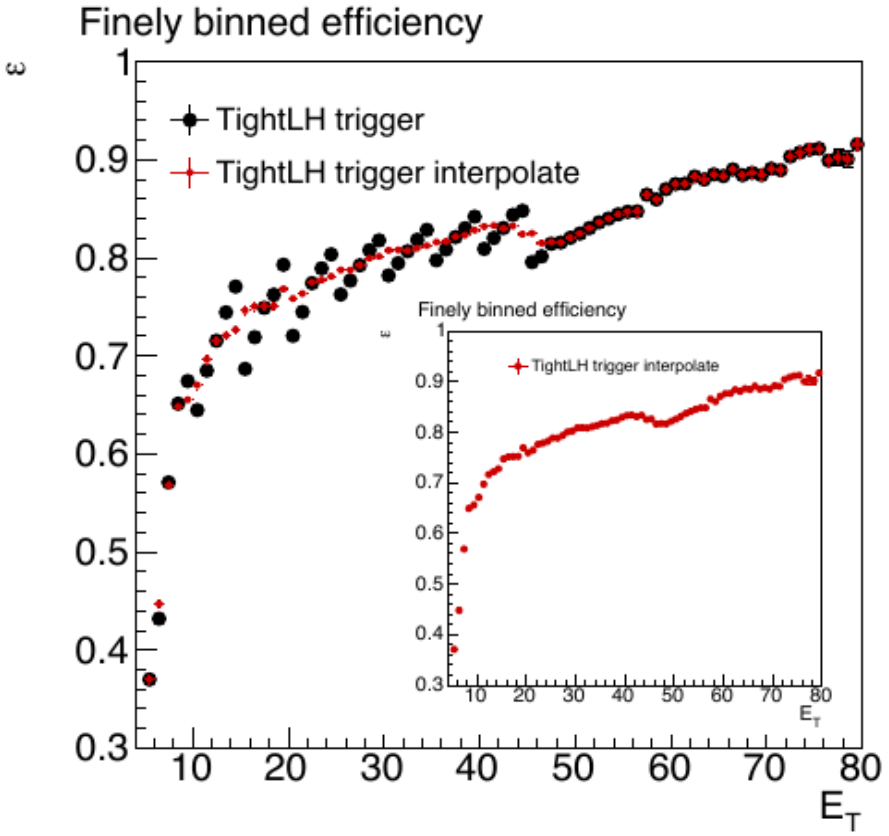

➔ looking for: continuous efficiency; implementation in analysis