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Introduction

- This page describes steps for performing truth study for charge mis-id electrons
- Our goals to understand precisely sources of charge mis-id and possible new ways to identify such electrons

References

- TRTeta - ID geometry
- Egamma improvements for R21 [↗](#) - ATLAS weekly on May 16

Planning

Phase 1

- Prepare detailed electron displays using information available with xAOD - done
- Presented in EGamma meeting on May 3rd [↗](#)

Phase 2

- Prepare detailed electron displays using information xAOD and ESD samples produced with release 21 - in progress

Proposed Phase 2 tasks

- Find out which ESD and xAOD MC samples we should use with release 21
 - ◆ EgammaMC16
- Convert PhysicsAth to compile with release 21 using CMake
- Repeat xAOD studies using release 21 MC samples
- Add superclusters to electron displays?
- Write new algorithms to read ESD collections for: electrons, tracks, hits, clusters, truth
- Prepare new ntuples that contain track hits and EM calorimeter clusters
- Include track hits and clusters into display

Phase 3

- Develop new truth classification

Proposed Phase 3 tasks

- Design criteria for new truth classification for charge mis-id electrons
- Collect feedback and develop implementation plan

Running on xAOD

First time setup

- Steps for checking out and compiling ntuple production code:

```
$ ssh lxplus042
$ mkdir -p ~/testarea/ChargeAth
$ cd ~/testarea/ChargeAth
$ svn co svn+ssh://svn.cern.ch/repos/manc/PhysicsNtuple/PhysicsAth/trunk/macros/setup
$ source setup/setup_first_new.sh
$ exit
```

Producing ntuples

- Steps for running athena jobs to produce ntuples:

```
$ ssh lxplus042
$ cd ~/testarea/ChargeAth
$ source setup_atlas_release_cvmfs.sh
$ athena $TestArea/PhysicsNtuple/PhysicsAth/share/procReadFxAOD.py -c "inputDir='/tmp/rustem/F"
```

- FULL_xAOD is link to two files from this MC dataset:
 - ◆ mc15_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2576_s21
- src/ReadSimpleTruth.cxx [↗](#) - class to save truth records

Running truth study

First time setup

- Steps for checking out and compiling analysis code:

```
$ ssh lxplus042
$ mkdir -p ~/testarea/ChargeLight
$ cd ~/testarea/ChargeLight
$ svn co svn+ssh://svn.cern.ch/repos/manc/PhysicsNtuple/PhysicsLight/trunk/macros/setup
$ source setup/setup_first_new.sh
$ exit
```

Running truth study

- Steps for running analysis to study truth of charge mis-id electrons:

```
$ ssh lxplus042
$ cd ~/testarea/ChargeLight
$ source setup_atlas_release_cvmfs.sh
$ python $TestArea/PhysicsNtuple/PhysicsLight/macros/charge/showChargeMisIdxAOD.py /tmp/rustem/
$ tail -f log
```

- Remove "--print-true" flag for less verbose processing
- Change this option to run over all events: "-n 0"
- This example uses a test file from "/tmp/rustem/"

Code links

- Main python configuration module: [python/PhysicsLightFlipxAOD.py](#)
- Main C++ class for analysis code: [src/Study/ShowChargeMisId.cxx](#)
- Histogram definitions: [config/charge/ShowChargeMisid.xml](#)

This topic: Main > PhysicsLightChargeFlip

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