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Tools commonly used in CLICdp physics benchmark analyses

This page intends to provide an overview of software tools used in CLICdp physics benchmark studies. These tools are typically used on analysis level after the official reconstruction chain.

Unless explicitly stated otherwise, the algorithms are independent of the detector concept assumed during the event simulation.

Jet reconstruction

Implementations of many jet reconstruction algorithms are available in the FastJet package: [link](#)

FastJet can be used through a thin wrapper called MarlinFastJet.

An example steering file can be found here:

```
/afs/cern.ch/eng/clic/software/x86_64-slc5-gcc41/ILCSOFT/v01-17-05/MarlinFastJet/v00-02/test/test
```

Most CLIC physics benchmark studies use the longitudinally invariant kt algorithm in the exclusive mode. The E-scheme is typically used for the recombination. The optimal R-parameter depends on the investigated signature and is tuned individually for each analysis.

Isolated electron and muon identification

A simple stand-alone processor called IsolatedLeptonFinder is available in MarlinReco. This processor can be used to identify isolated leptons originating from the primary event vertex (for example from W or Z boson decays). The particle identification uses the energy deposits in the ECAL and HCAL, but not the information from the muon system.

An example steering file can be found here:

```
/afs/cern.ch/eng/clic/software/x86_64-slc5-gcc41/ILCSOFT/v01-17-05/MarlinReco/v01-09/Analysis/Iso
```

Identification of hadronic tau lepton decays

Hadronic tau lepton decays can be identified using the TauFinder processor developed by Astrid Münnich.

A full description of the algorithm is given in this LCD-Note: [link](#)

The source code can be found in the SVN of the LCD group:

```
svn+ssh://svn.cern.ch/repos/clicdet/trunk/ILD/reco/TauFinderProcessors/
```

At the moment no dedicated package exists for **leptonic tau lepton decays**. If the user intends to veto or find isolated lepton of any flavour (e, μ , τ), it is recommended to execute the IsolatedLeptonFinder and TauFinder processors successively. The former identifies electrons and muons as well as leptonic tau decays while the latter finds the remaining hadronic tau lepton decays.

Event shapes

Something on event shapes...

Flavour tagging

Something on LCFIPlus and the different strategies to suppress beam-induced backgrounds...

This topic: CLIC > AnalysisTools

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