

Muon Collider Full Simulation

June 1, 2021

Tutorial

<https://github.com/MuonColliderSoft/MuC-Tutorial>

The steps are clear to follow. However, note:

Change the detector geometry address

`/opt/ilcsoft/v02-01-pre/detector-simulation/geometries/CLIC_o3_v14_mod4/CLIC_o3_v14.xml`

`/opt/ilcsoft/muonc/detector-simulation/geometries/CLIC_o3_v14_mod4/CLIC_o3_v14.xml`

and input file address, otherwise get errors.

`/data/samples/HH/mumu2H2bb750.stdhep`

`/scratch/slomte/MuC-Tutorial/tutorial/trial/mumu2H2bb750.hepmc`

Simulation and reconstruction

Most steps worked fine.

Got `histograms.root` output file (need to look into more details)

For example, the `reco_steel_Hbb.xml` file has information about the digitizer process --> plots for sub-detectors (e.g hitE in vertex barrel)

Next steps

- To produce LCTuple (produced from collections in slcio file)

use `Marlin lctuple_steel.xml > ntuples.out 2>&1`

Get `JetHistograms.root` file (But this file is empty!)

Supposed to give number of jets, mass, pT, E, theta, phi histograms.

- Need to generate signal samples using MadGraph.

Tried `mumu2nunuH2nunu` generation, but error when using Pythia in MadGraph on my local setup (but solvable).

Thanks Daniel, for provided a signal file!