

Instructions for new user

1. CERN account
2. Grid certificate: (https://www.hep.wisc.edu/cms/comp/accountSetup.html#grid_cert)

3. Get hep.wisc account. You will be granted username and temporary password.

Note: For new users, need access permission to the Muon Collider machine (mucol01) and you should explicitly request for this access.

4. Simulation setup instructions:
<https://confluence.infn.it/display/muoncollider/Installation#Installation-Simulation>
 - Log into login.hep.wisc.edu using SSH (run `<ssh username@login.hep.wisc.edu>`) and change the password using `<passwd>`
 - `<ssh mucol01>`
 - `<cd /scratch>`
 - Create your directory here and git clone the utils repository

`<mkdir directory_name>`

`<git clone https://github.com/MuonColliderSoft/MuonCutil>`

`<cd MuonCutil/SoftCheck/>`

Running the Simulation setup

The geometry definition is given in the [/opt/ilcsoft/muonc/detector-simulation/geometries/MuColl_v1/MuColl_v1.xml](#) file

The number of events can be specified in the [sim_steer.py](#) file under SIM.numberOfEvents

Input and output files are under SIM.inputFiles and SIM.outputFile

- Run `ddsim --compactFile /opt/ilcsoft/muonc/detector-simulation/geometries/MuColl_v1/MuColl_v1.xml --steeringFile sim_steer.py > sim.out`

Running the Reconstruction

- `Run < Marlin --InitDD4hep_mod4.DD4hepXMLFile=/opt/ilcsoft/muonc/detector-simulation/geometries/MuColl_v1/MuColl_v1.xml reco_steel.xml > reco.out >`

This gives two output files `Output_REC.slcio` and `histograms.root`

The root file will have plots and trees, the slcio file will have the collections produced (specify as per need)(yet to check the details here!)

Next Steps:

Check the details of various input & output files and detector geometry

Simulate some example decays (like $\mu\mu \rightarrow \nu\bar{\nu} H H$)