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# MC EVENTS IN CLIC

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# Software environment at CLIC

- ILCSoft environment uses DD4hep to generate MC events
- Uses Mokka for simulation and Marlin for reconstruction
- Marlin has an interface to FastJet, which will come in useful later
- Mokka takes generator inputs in hepevt format.

# DD4hep

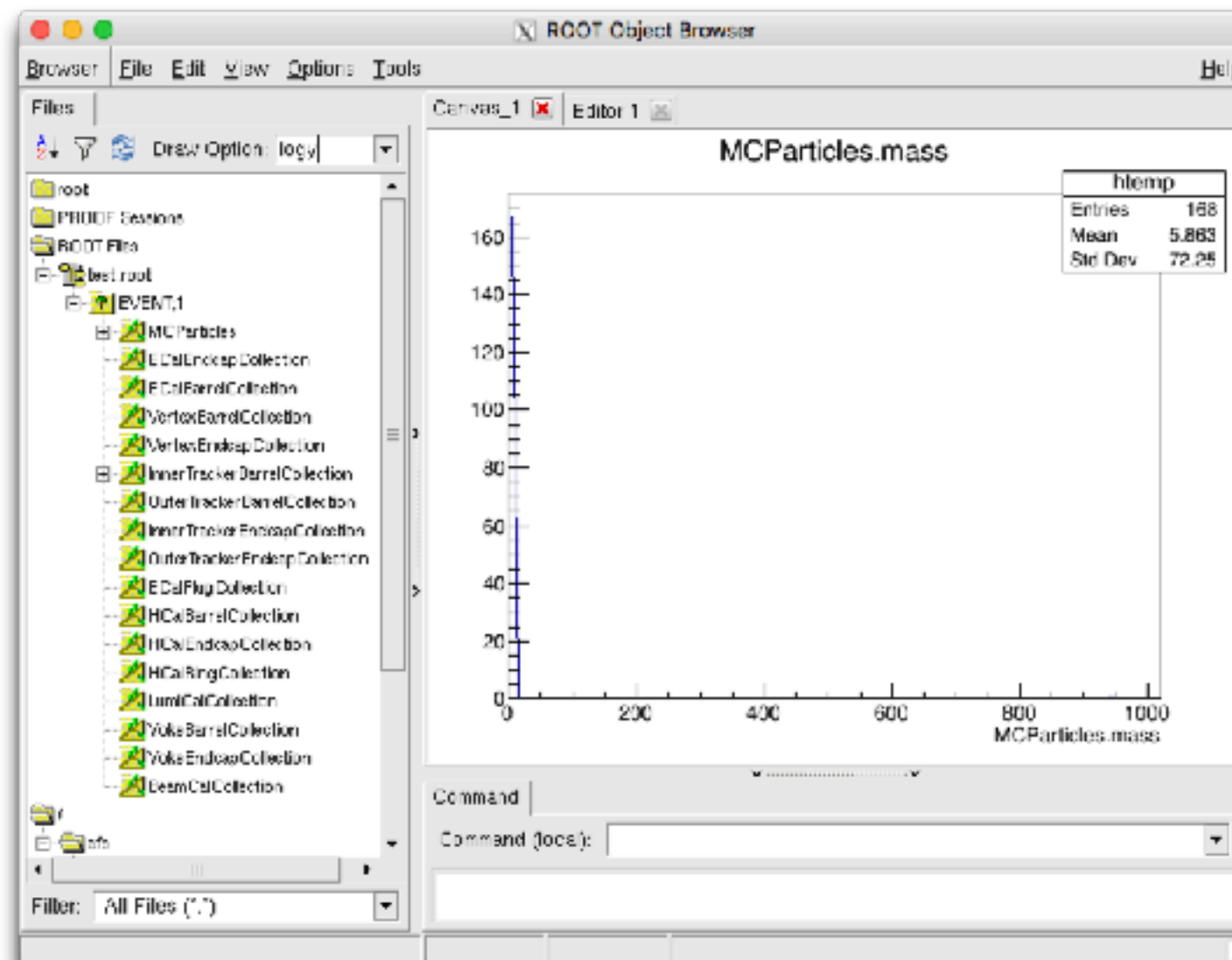
- Running on lxplus
- Using ILCSoft version in init file `"/cvmfs/clicdp.cern.ch/iLCSoft/builds/2016-11-22/x86_64-slc6-gcc48-opt/"`
- Using CLIC detector model `CLIC_o3_v07`
- Tested using particle gun:
  - `source /cvmfs/clicdp.cern.ch/iLCSoft/builds/2016-11-22/x86_64-slc6-gcc48-opt/init_ilcsoft.sh`
  - `ddsim --compactFile /cvmfs/clicdp.cern.ch/iLCSoft/builds/2016-11-22/x86_64-slc6-gcc48-opt/lcgeo/HEAD/CLIC/compact/CLIC_o3_v07/CLIC_o3_v07.xml -O Output/test.root -N 10 --random.seed 6546777 --enableGun --gun.particle mu- --gun.energy 10*GeV --gun.distribution uniform`

# Converting from HepMC to hepevt

- DD4hep can take hepevt input, but the files we currently have are in HepMC format
- CLIC has a converter script which requires HepMC to be installed first
- Tested on eejj.hepmc file from Maurizio and generated sample ROOT ntuple with 10 events

# DDSim outputs

```
Warning in <TClass::Init>: no dictionary for class DD4hep::Simulation::Geant4Particle is available
Warning in <TClass::Init>: no dictionary for class DD4hep::dd4hep_ptr<DD4hep::Simulation::ParticleExtension> is available
Warning in <TClass::Init>: no dictionary for class auto_ptr<DD4hep::Simulation::ParticleExtension> is available
Warning in <TClass::Init>: no dictionary for class DD4hep::Simulation::ParticleExtension is available
Warning in <TClass::Init>: no dictionary for class DD4hep::Simulation::Geant4Calorimeter::Hit is available
Warning in <TClass::Init>: no dictionary for class DD4hep::Simulation::Geant4HitData is available
Warning in <TClass::Init>: no dictionary for class DD4hep::dd4hep_ptr<DD4hep::Simulation::DataExtension> is available
Warning in <TClass::Init>: no dictionary for class auto_ptr<DD4hep::Simulation::DataExtension> is available
Warning in <TClass::Init>: no dictionary for class DD4hep::Simulation::DataExtension is available
Warning in <TClass::Init>: no dictionary for class DD4hep::Simulation::Geant4HitData::MonteCarloContrib is available
Warning in <TClass::Init>: no dictionary for class DD4hep::Simulation::Geant4Tracker::Hit is available
```



# GRID

- Documentation to run ddsim on the grid is available. May be useful soon.
- <https://twiki.cern.ch/twiki/bin/view/CLIC/CLICDD4hep>

BACKUP

# Installing HepMC on lxplus

```
wget http://lcgapp.cern.ch/project/simu/HepMC/download/HepMC-2.06.08.tar.gz
```

```
unzip HepMC-2.06.08.tar.gz
```

```
tar -xvf HepMC-2.06.08.tar
```

```
rm HepMC-2.06.08.tar
```

```
cd HepMC-2.06.08
```

```
autoreconf --install
```

```
autoconf
```

```
cd ..
```

```
mkdir build
```

```
mkdir HepMC
```

```
cd build
```

```
../HepMC-2.06.08/configure -prefix=/afs/cern.ch/user/m/mazhang/Projects/JetCalo/HepMC --with-momentum=GEV --with-length=MM
```

```
make
```

```
make install
```



# Installing and running HepMCToHEPEvt

```
source /afs/cern.ch/sw/lcg/contrib/gcc/4.7/x86_64-slc6-gcc47-opt/setup.sh
```

```
export CC=`which gcc`
```

```
export CXX=`which g++`
```

```
svn co svn+ssh://svn.cern.ch/repos/clicdet/trunk/tools/HepMCToHEPEvt
```

```
cd HepMCToHEPEvt
```

```
mkdir build
```

```
cd build
```

```
cmake -DHepMC_DIR=/afs/cern.ch/user/m/mazhang/Projects/JetCalo/HepMC ..
```

```
make
```

```
cd ../..
```

```
HepMCToHEPEvt/build/src/HepMCToHEPEvt Data/eejj.hepmc Output/eejj.hepevt
```

# Running DDSim

```
ddsim --compactFile /cvmfs/clicdp.cern.ch/iLCSoft/  
builds/2016-11-22/x86_64-slc6-gcc48-opt/lcgeo/  
HEAD/CLIC/compact/CLIC_o3_v07/  
CLIC_o3_v07.xml -O Output/eejj.root -N 10 --  
random.seed 6546777 --inputFiles Data/eejj.hepevt
```