

MG tutorial on Lxplus

●○○○ Jul 24, 2025

Install MadGraph/Pythia/Delphes on Lxplus.

At beginning, you should login to Lxplus.

Prepare Install

You can find Madgraph at Download page of [The MadGraph5_aMC@NLO homepage](#), or use the link next:

```
1 # for stable version
2 wget https://launchpad.net/mg5amcnlo/lts/2.9.x/+download/MG5_aMC_v2.9.24.tar.gz
3 # for latest feature
4 wget http://launchpad.net/madgraph5/3.0/3.6.x/+download/MG5_aMC_v3.6.3.tar.gz
```

to download Madgraph package.

Note

The next version we demonstrate is based on the latest version, for stable version is similar.

After we need to extract it:

```
1 tar -xzf MG5_aMC_v3.6.3.tar.gz
2 cd MG5_aMC_v3_6_3
```

Download ExRootAnalysis in MG5 directory

```
1 wget
  http://madgraph.phys.ucl.ac.be//Downloads/ExRootAnalysis/ExRootAnalysis_V1.1.2.tar.gz
```

Install Extensions

Install Pythia8

At MG5_aMC directory, MG5 will automatic run by using:

```
1 ./bin/mg5_aMC
```

Install pythia8 with lhpdf , hepmc2 etc.

```
1 MG5_aMC>install pythia8
```

It may take a few time to install this.

After that, exit MG5 and this line in your `.bashrc` :

```
1 export
  LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/path/to/your/MG5_aMC_v3_6_3/HEPTools/lhapdf6_py3//lib
```

Install ExRootAnalysis

Extract what we download:

```
1 tar -xvzf ExRootAnalysis_V1.1.2.tar.gz ExRootAnalysis
2 cd ExRootAnalysis
```

Edit `Makefile` in Line 17~18, add `rpc lib` in there:

```
1 Line 17-18:
2 --- CXXFLAGS += $(ROOTCFLAGS) -Wno-write-strings -D_FILE_OFFSET_BITS=64 -DDROP_CGAL -I.
3 --- LIBS = $(ROOTLIBS)
4 +++ CXXFLAGS += $(ROOTCFLAGS) -Wno-write-strings -D_FILE_OFFSET_BITS=64 -DDROP_CGAL -I. -
  I/usr/include/tirpc
5 +++ LIBS = $(ROOTLIBS) -ltirpc
```

exit and make:

```
1 make -j16
```

Install Delphes

Entering MG5 directory, download `Delphes` from [Delphes](#)

```
1 git clone https://github.com/delphes/delphes Delphes
2 # or use ssh (for area cannot connect to GitHub)
3 git clone git@github.com:delphes/delphes.git Delphes
4
5 cd Delphes
```

add environment for run `Delphes`

```
1 source /cvmfs/sft.cern.ch/lcg/views/LCG_105/x86_64-el9-gcc12-opt/setup.sh
```

Warning

We need to use the environment as above before each use of `Delphes` , but this will **modify** some variables in the system. Therefore, we suggest to create a new script to source before each use of `Delphes` .

After that, we can build it

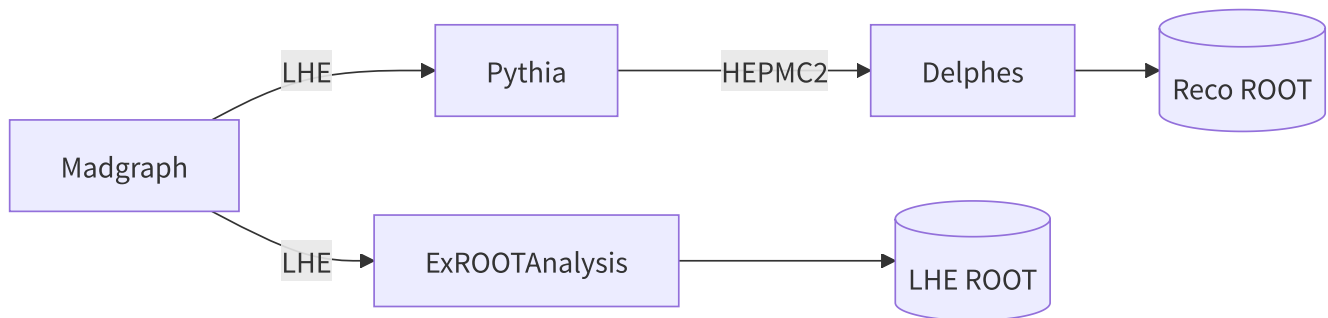
```
1 make -j16
```

Exit shell.

⚠ Caution

If you don't exit, the env setting after source just now will cause an **error** running `ExRootAnalysis/Pythia`. You can try to install `ExRootAnalysis/Pythia` after the source setting script, we haven't succeeded yet because it **cannot** run `Pythia` and `Delphes` at the same time.

Run Madgraph



Just run:

```
1 | ./bin/mg5_aMC
```

Using this as a **general rule**, set:

- `shower = pythia8`
- `detector = OFF`
- `analysis = ExRoot`

We can use the default Lxplus environment to complete the generation to `HEPMC2`, and then using `Delphes` to fast simulation detector:

```
1 | $ ./DelphesHepMC2 config_file output_file input_file
2 | Usage: DelphesHepMC2 config_file output_file [input_file(s)]
3 | config_file - configuration file in Tcl format,
4 | output_file - output file in ROOT format,
5 | input_file(s) - input file(s) in HepMC format,
6 | with no input_file, or when input_file is -, read standard input.
```

📌 Note

This step need source `setup.sh` in section *Install Delphes*.