Tutorial CASCADE-LHE

REF 2018 workshop, Cracow
23. Nov 2018

- login to tutorial account:
```
ssh -X schoolXX@naf-school01.desy.de
cd public

source /afs/desy.de/user/j/jung/scratch/ref2018/setup.sh
```

- all CASCADE lhe files and steering files are under:
`/afs/desy.de/user/j/jung/scratch/ref2018/cascade3/local/share/cascade/LHE`

- Instructions to run CASCADE with Rivet for the event analysis and plot production:
```
mkdir /tmp/$(whoami)
export HEPMCOUT=/tmp/$(whoami)/myfile.hepmc
mkfifo $HEPMCOUT

cascade < steeringXXXX.txt > mycascade.out &
rivet -a LHCB_2014_I1262703 $HEPMCOUT

rivet-mkhtml -o myresults Rivet.yoda:"Title=CAS-LHE"
```

  on your laptop:
```
scp -rp schoolXX@naf.school01.desy.de:/afs/desy.de/user/s/school90/public/myresults .

firefox myresults/index.html
```

- run CASCADE-LHE with Zj-LHE file with LHCb Rivet plugin for $Z+j$ configuration at 7 TeV (`LHCB_2014_I1262703`).
  - use KaTie LHE file (done in KaTie tutorial), together with Rivet for analysis.
    - edit steering file `steering-KaTie.txt`
      - copy lhe file to your directory and gunzip it
      - pure LHE configuration (no TMD, no parton shower, no hadronization)
      - use initial state parton shower and hadronization
  - use POWHEG LHE file (provided) for $Z+j$ configuration
    - edit steering file `steering-DY-PH-7TeV.txt`
      - copy lhe file to your directory and gunzip it
      - pure LHE configuration
      - with TMD (but without parton shower)
      - with TMD and parton shower
      - check the differences when LO or NLO splitting functions in the initial state partons shower are used
  - compare the results from the different runs

- run CASCADE-LHE for DY production with POWHEG with different ptsqmin cuts and aMCatNLO files,
  - use Rivet plugin `ATLAS_2015_I1408516` (8 TeV) for DY production:
  - edit steering file `steering-DY-XX-8TeV.txt`
    - copy lhe file to your directory and gunzip it
    - run without TMD and PS
    - run with TMD
    - include parton shower from TMDs