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mcfm application

Private version of MCFM which uses semi-numerical techniques for the calculation of the virtual one-loop corrections.

AFS work area: `/afs/cern.ch/sw/arda/install/theory/mcfm`

HOW TO RUN

- Log-in to any lxplus machine.
- `setenv GANGA_CONFIG_PATH /afs/cern.ch/sw/arda/install/theory/mcfm/mcfm.ini`
- `setenv PATH /afs/cern.ch/sw/ganga/install/4.3.9/bin:$PATH`
- run ganga for the first time to make sure that your grid proxy is valid for the time long enough
 - ◆ `ganga`
 - ◆ `gridProxy.timeleft()` check how many hours are left and if necessary proceed with the next commands
 - ◆ `gridProxy.validityAtCreation = '240:00'` (let's say 10 days is a safe margin)
 - ◆ `gridProxy.create()`
 - ◆ Type `Ctrl-D` to exit to shell
- Submitting your jobs is as easy as:
 - ◆ `ganga submit_mcfm.py dirs...`
 - ◆ `dirs` is a space-separated list of directories: e.g. `virtcuts80-160-1 virtincl40-80-1 ...` (you may use wildcards like this `some/dir/vircuts*`)
 - ◆ you may use any directories created with the `writeinput-virt.pl` script in any location (so you are NOT locked in `/afs/cern.ch/sw/arda/install/theory/mcfm`)
 - ◇ we as the directory-specific input we take the "WW_*" and "input.DAT" files
 - ◇ the common files (Pdfdata, mcfm, ...) are taken directly from `/afs/cern.ch/sw/arda/install/theory/mcfm` directory
 - ◇ actually the symlinks created by the `writeinput-virt.pl` are not used
 - ◆ when your job is submitted a symlink "output_NN" is created which points to the ganga output directory for that job
 - ◆ by default the outputs are stored in `~/ganagrc` in your AFS home (this may be changed easily)
 - ◆ there is a small additional file produced by ganga (`vcard.txt`) - I need all of these files for further analysis of the system, please do NOT remove them, they are very small

It is UP TO YOU to do the splitting and to generate correct random seeds using `writeinput-virt.pl` script. I propose to use jobs which take approximately 12 hours.

When you submitted all (or part) of your jobs you may run `ganga` interactively and then you type `jobs` you should see their status. The status and output files are automatically retrieved when ganga is running interactively.

For more info how to use ganga read the ganga manual at <http://cern.ch/ganga>

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- we have all templates generated in the work area: all directories like `virtcuts120-80-1`, `virtincl40-80-1`
- running: `cd virtcuts120-80-1; ./mcfm` OR for a test run: `../mcfm_test`
- we will only variate the seed, we set the number of iterations to be relatively small
- total capacity required is around 5 CPU years

TODO:

- give access to lcgui003 for Giulia (zanderi)

meeting 06.08.2007

```
'5.1'          [file version number]

[Flags to specify the mode in which MCFM is run]
.false.       [evtgen]
.false.       [creatent]
.false.       [skipnt]
.false.       [dswhisto]

[General options to specify the process and execution]
66            [nproc]
'virt'       [part 'lord','real' or 'virt','tota']
'wwgcuts09'  ['runstring'] # input/output
14000d0      [sqrts in GeV]
+1           [ih1 =1 for proton and -1 for antiproton]
+1           [ih2 =1 for proton and -1 for antiproton]
160d0       [hmass]
120d0       [scale:QCD scale choice] # 40 60 80 120 160
80d0       [facscale:QCD fac_scale choice] # idem (one is always 80 =
.false.     [dynamicsscale]
.false.     [zerowidth]
.false.     [removebr]
40          [itmx1, number of iterations for pre-conditioning] # 400K = 1CPU week, we could
10000      [ncall1] #
40          [itmx2, number of iterations for final run] # check if this is unus
10000      [ncall2]
1917       [ij] # ra
.true.     [dryrun]
.true.     [Qflag]
.true.     [Gflag]

[Pdf selection]
'mrs4nf4'   [pdlabel]
4           [NGROUP, see PDFLIB]
46          [NSET - see PDFLIB]
cteq6l.LHgrid [LHAPDF group]
-1         [LHAPDF set]

[Jet definition and event cuts]
0d0        [m34min]
14000d0    [m34max]
0d0        [m56min]
14000d0    [m56max]
.true.     [inclusive]
'ktal'     [algorithm]
30d0       [ptmin_jet]
1.8d0     [etamin_jet]
4.5d0     [etamax_jet]
0.6d0     [Rcut_jet]
.true.     [makecuts]
20d0      [ptmin_lepton]
2.5d0     [etamax_lepton]
30d0      [ptmin_missing]
10d0      [ptmin_lepton (2nd+)]
2.5d0     [etamax_lepton (2nd+)]
0.4d0     [R(jet,lept)_min]
0.2d0     [R(lept,lept)_min]
0d0       [Delta_eta(jet,jet)_min]
.false.   [jets_opphem]
0         [lepbtwnjets_scheme]
15d0     [ptmin_bjet]
2d0      [etamax_bjet]
```

```
6.5d0      [ptmin_photon]
2.5d0      [etamax_photon]
0.4d0      [cone_photon]
1d0        [cone_ptcut]

[Anomalous couplings of the W and Z]
0.0d0      [Delta_g1(Z)]
0.0d0      [Delta_K(Z)]
0.0d0      [Delta_K(gamma)]
0.0d0      [Lambda(Z)]
0.0d0      [Lambda(gamma)]
2.0d0      [Form-factor scale, in TeV]

[How to resume/save a run]
.true.     [readin]
.false.    [writeout]
''         [ingridfile]
''         [outgridfile]
```

meeting 06.06.2007

Very long jobs, very large software installation tarball (including the f90 compiler).

We need an example running at CERN.

-- JakubMoscicki - 06 Jun 2007

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