



HERA and the LHC

News on NLOLIB

WG5: MC Tools



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News

- New Version will be made available end of this week
 - ▶ Self-written make/perl install procedure replaced by GNU standard tools
- Will set up mailing list for questions/problems:
 - ▶ To be entered mail to klaus.rabbertz@cern.ch
- Continue to work also after the end of the Workshop ;-)
 - ▶ Starting analysis involving pp NLO calculations with new Diploma student next month
 - ▶ Found some other people struggling with NLOJET++



NLOLIB Installation (1)

- Get the tgz archive from <http://www.desy.de/~nloblib>

- Unpack it: `tar xvfz nloblib_i_j_k.tgz`

- `cd nloblib`

- `source nloblib.csh`

- Set LIBDIRs for CERN, HZTOOL,...
- Adapt to your needs

- Run the GNU install tools:

- ▶ `./configure`

- Generates the Makefiles

- ▶ `make`

- Compiles the source code
- Links libraries and binaries

- ▶ `make install`

- Copies the libs and binaries to predefined directories



NLOLIB Installation (2)

- In case a complete rebuild is necessary for your architecture:
 - ▶ Check basic input files → `configure.ac`, `Makefile.am`'s
 - ▶ Run the GNU build system (in top directory):
 - ▶ `aclocal` →
 - Looks for macros needed by automake
 - Includes user defined macros
 - Creates cache for faster reprocessing
 - ▶ `autoheader` →
 - Generates `config.h.in`
 - ▶ `automake` →
 - Generates `Makefile.in`'s
 - ▶ `autoconf` →
 - Generates a new `configure` script



Content

- Sources in subdir [src](#), adapted to NLOLIB:
 - ▶ DISENT 0.1 (S.Catani, M.Seymour)
 - ▶ DISASTER++ 1.0.1 (D.Graudenz)
 - ▶ RacoonWW 1.1 (A. Denner, S.Dittmaier, M. Roth, D. Wackerroth)
 - ▶ JetViP 2.1 (B. Pötter) [Not fully done, have to check with Thomas]
 - ▶ MEPJET 2.2 (E.Mirkes, D.Zeppenfeld, St. Willfahrt) [Numerical problem]
 - ▶ Nlojet++ 2.0.1 (Z. Nagy), [Original sources only, still working on it]
- Examples in subdir [src/examples](#):
 - ▶ epshapes: Event shape calculations for ep collisions
 - ▶ eewwangl: $ee \rightarrow WW \rightarrow 4f$ angular distributions
- Documentation in [doc](#), hztool example in dir [hztool](#):



Part of a Steering Card

Predefined cuts

```
!--- LAB FRAME CUTS ON THE EP FINAL STATE LEPTON ---
'ELMI' 14.           ! minimum lepton energy           (D=0. GeV)
'ELMA' 100000.      ! maximum lepton energy          (D=1000. GeV)
'TLMI' 157.         ! minimum lepton polar angle     (D=0. deg)
'TLMA' 173.         ! maximum lepton polar angle     (D=180. deg)
'TQMI' 20.          ! minimum QPM quark angle        (D=0. deg)
'TQMA' 180.         ! maximum QPM quark angle        (D=180. deg)
```

DISENT specific steering parameters

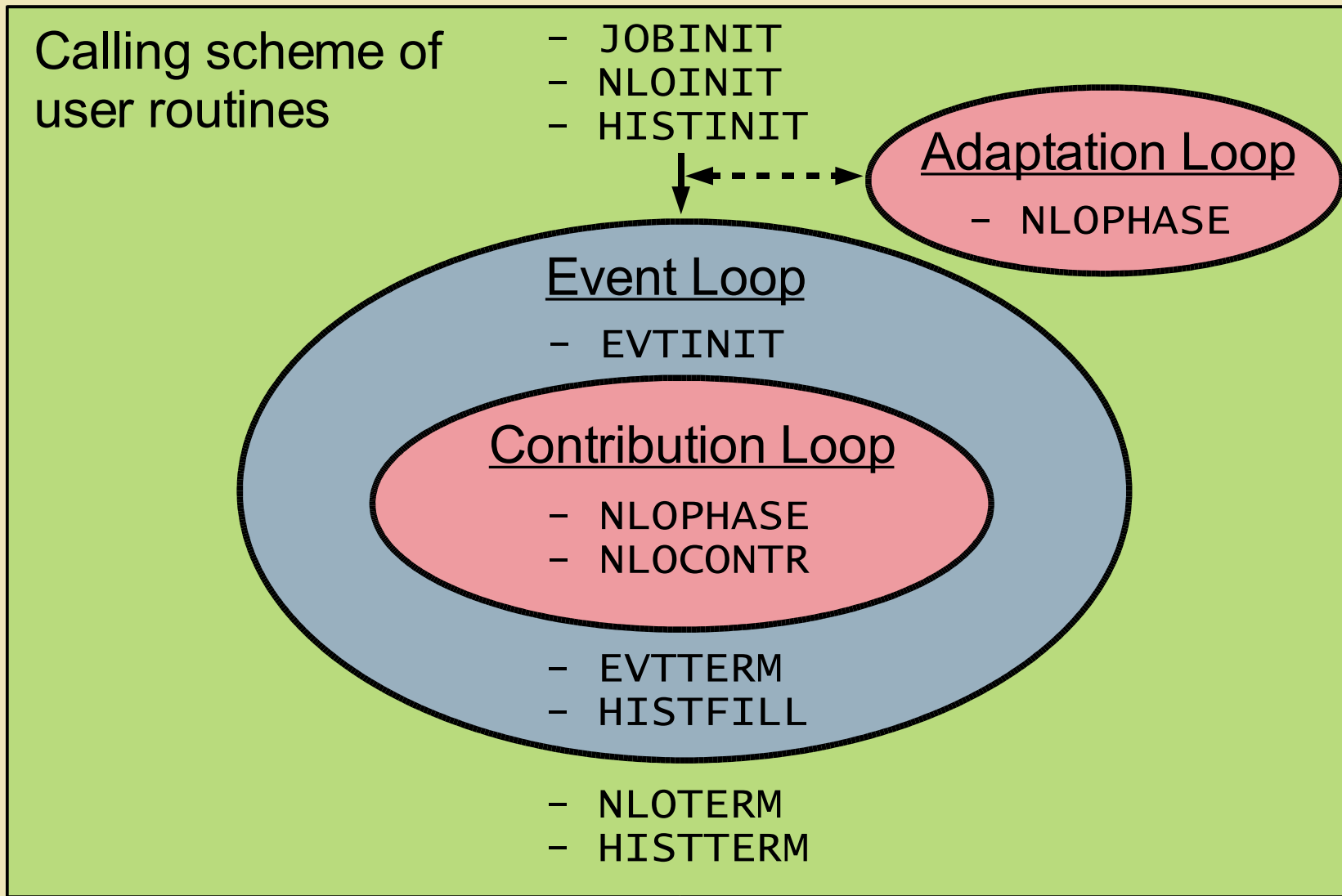
```
!--- DISENT SPECIFIC STEERING ---
DISE 0              ! DISENT specific steering card
'ISED1' 12345       ! random number seed 1           (D=12345)
'SEDH' 678900      ! random number seed 2          (D=678900)
'NP01' 3           ! 1+1 -> 2+1 importance sampling  (D=2)
'NP02' 2           ! 2+1 -> 3+1 importance sampling  (D=4)
'SCHE' 0           ! MSbar(0), DIS(1) factorization scheme (D=0)
```

User definable steering parameters

```
!--- PRIVATE STEERING ---
PRIV 0
'PWEN' 'test'      ! (D='pqcd') PAW file name: mep22/dis01/des101xxx.paw
'HIST' 62          ! (D=62) histo steering: m/o w histos,y wghts,histo,funct.
'SM1L' 0.025      ! (D=0.025) lower cut in 1-T_C
'SM1R' 0.5        ! (D=0.5) upper cut in 1-T_C
'SH1L' 0.0        ! (D=0.0) left edge for binning 1-T_C
'SH1R' 0.5        ! (D=0.5) right edge for binning 1-T_C
'NB1' 20          ! (D=20) number of bins for 1-T_C
```



User Routines





Summary

- Unfortunately, progress was slower than foreseen:
 - ▶ JetViP integration not fully done, have to check with Thomas
 - ▶ One problem with MEPJET has disappeared ... only to be replaced by another
 - ▶ Lacking still full integration of NLOJET++
- Work will continue after the end of the Workshop ...

- Some consolation: 1 Million DISENT events

Intel 486DX2 66 (1994): 23000 sec

AMD Opteron 240 (2004): 450 sec

/50

For more information see the documentation included in NLOLIB:

- Download page: <http://www.desy.de/~nloblib>



Victor's Wishlist

- pp program from Klasen
- MCFM: <http://mcfm.fnal.gov>
- JETRAD/DYRAD: N.Glover, W.Giele, D.Kosower
- PHOX:
http://www1app.in2p3.fr/lapth/PHOX_FAMILY/main.html
- FMNR: <http://www.ge.infn.it/~ridolfi/dijet/>
- AYLEN/EMILIA:
<http://www.itp.phys.ethz.ch/staff/dflorian/codes.html>
- Heavy Quark programs ...

► **Volunteers!?**