MC group meeting – 20. July 09

Announcements

Monte Carlo position

MONTE CARLO .

DESY, Hamburg location, is seeking:
Physicist Ph.D. (m/f)

DESY
DESY is one of the leading accelerator centres worldwide. The Laboratory's main research areas comprise a broad program of photon science, including construction, operation and use of synchrotron-light sources and of X-ray lasers, and research in elementary particle and astroparticle physics.

The Analysis Centre of the Helmholtz Alliance "Physics at the Terascale" at DESY supports German physicists working on analysis at ATLAS, CMS and ILC in areas like Monte Carlo generators, parton distribution functions and statistics tools. The Monte Carlo group is a major activity of the Analysis Centre. The group consists of theoretical and experimental physicists working on all aspects of MC generators. The group supports validation and tuning of existing Monte Carlo event generators. It also organizes schools, tutorials and discussion days on MC issues.

The position
The successful candidate is expected to actively contribute to and shape these areas. He or she is expected to be active in the tuning and validation of existing Monte Carlo event generators. Therefore, experience in tuning and validation in either pp and/or ep environments is considered an advantage. A close collaboration with the experiment is necessary. The candidate is also expected to carry out research within one of the Alliance projects for about 50% of his or her time, preferably within one of the LHC experiments.

Requirements
- Ph.D. in physics
- Interest and experience with Monte Carlo event generators, especially with their tuning and validation
- Good communication skills

For further information please do not hesitate to contact Thomas Schoerner-Sadenius (thomas.schoerner@desy.de), Judith Katzy (judith.katzy@desy.de) or Hannes Jung (hannes.jung@desy.de).

- **Offer for position has been given....**
  decision within next weeks ....

HZTOOL & C++

- Wrapper for C/C++ to HZTOOL has been written
- all features of HZTOOL retained in C/C++
  - will be used by summerstudents
  - will be upgraded by summerstudents
- Will be released with manual update after summer
- Can be used by all Collaborations to include HERA analyses in C/C++ with ROOT histogramming.

```
using namespace HZTOOL;

extern "C" {
void hztemptocc_(const int & iflag)
{
    /* Initialized data */

    static char xxxx[9] = "temptocc";
    static int nentry = 0;

    /* Local variables */
    double ee,x,y,q2,wt;
    int iel;
    static float qpi;
    int idum;
    static float sigm;
    int ierr;
    static float nevt;

    static float lumnb, lumpb;

    int ibeaml, ibeamp;
    int ihep;
    static float qqradp;

/* ************************************************************** */
/*                      Initialization */
/* ************************************************************** */
    if (iflag == 1) {
        qpi = atan(1.) * 4.;
        qqradp = 180. / qpi;

    }
/* ************************************************************** */
/*                    Event Processing */
/* ************************************************************** */
    else if (iflag == 2) {
        wt = heracmn.wtx;
        ++nentry;
        nevt += heracmn.wtx;
        cout << " nevt , nentry "<< nevt << " " << nentry << endl;
        hzibeam(ibeamp, ibeaml);
        cout << " ibeamp = " << ibeamp << " ibeaml = " << ibeaml << endl;
//      hzpylist(1);
/* get kinematics */
        q2= hzdiskin(1);
        x = hzdiskin(2);
        y = hzdiskin(3);
```

Lecture on QCD & MC

10 July

17 July

23 July

30 July

- morning lectures
- afternoon exercises
- Discussion Forum
- Lectures are recorded
- ca 9 people from remote connected
- ca 10-12 from DESY

https://www.desy.de/~jung/qcd_and_mc_2009/

QCD AND MONTE CARLOS

QCD and Monte Carlos
Lecture Course
Hannes Jung (DESY, U Antwerp)
DESY - Hamburg
10, 17, 23, 24 July 2009

The lecture course is intended for master students, PhD students and postdocs. It covers a basic introduction to QCD and the QCD evolution equations (DGLAP, BFKL and CCFM). A basic introduction to Monte Carlo methods will be given, and these methods will be applied to calculate cross sections and the evolution of parton densities.

During the course we will learn, how to write a small program to integrate a partonic cross section. We will apply Monte Carlo methods to solving the DGLAP evolution equation and to calculate the transverse momentum spectrum of Higgs production in proton-proton collisions at the LHC.

The course is held at DESY, in blocks of 1-2 day lectures with exercise sessions in the afternoon.

The lectures will be from 9:15 - 12:00 on
10. July Sem 2
17. July Sem 2
23. July Sem 2
24. July Sem 2
with exercises in the afternoon from 14:00-17:00 in Sem 1

NEW

- Discussion Forum
- Lectures
  Video recordings of all lectures
  ☑ Webcast (please click on Lectures)
  ☑ mp4
  Slides
  - lecture 9. July
    - pdf1, pdf2 indico
  - lecture 17. July
    - pdf
- Exercises
  - Root in 5 seconds
  - How to get started
  - Exercise 1 text sheet
    - Exercise 1 template
    - Exercise 1 (solutions)
  - Exercise 2 text sheet
    - Exercise 2 template
    - Exercise 2 (solutions)

Literature:
Partons in QCD   G. Altarelli, Phys. Rept 81 (1981)
Collider Physics   V.D. Barger & R.J.N. Phillips
Deep Inelastic Scattering.   R. Devenish & A. Cooper-Sarkar
Basics of pQCD   Y. Dokshitzer, V. Khoze, Al Mueller, S. Troyan
QCD and collider physics   R.K. Ellis & W.J. Stirling & B.R. Webber

AOB

- Structure and organization of MC group

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