E391a Detector Simulation Code

E391aG4 User's Guide
Version 58

1 introduction

At the moment the E391a detector simulation code (E391aG4) is installed at PC-Linux machine: `kl-3.kek.jp` RedHat 4.2 and `dnp160.jinr.ru` SuSe Linux 7.1.

2 What should be installed on your PC

The following tools are necessary to have at your system to compile and run your code properly: **CLHEP, Root, Geant4**. Also the **X11** driver **OpenGL(Mesa)** is necessary, but it appears in almost all Linux systems.

If the software is already installed you can pass this section

2.1 CLHEP

Installation date:	11-Dec-2001
Version:	**v1.6**
Installed at:	`/usr/local/include/`
Source:	**CERN**
Download from:	**www.info.cern.ch/asd/lhc++/clhep/index.html**

At location `/usr/local/lib` should appear both: the library itself (`libCLHEP-g++.a`) and the link `libCLHEP.a`. The latter is defined as follows:

```
ln -s /usr/local/lib/libCLHEP-g++.a /usr/local/lib/libCLHEP.a
```

CLHEP instalation can be done only by the superuser.

2.2 Root

Installation date:	11-Dec-2001
Version:	**v3.01.06**
Installed at:	`/home/gogi/root/`
Source:	**CERN**
Download from:	**root.cern.ch/root/Availability.html**
Documentation:	**root.cern.ch/root/RootDoc.html**

Root installation should be done by superuser to have a permission to place the file:

`/etc/root/root.mimes`

Each user can define in his $HOME the file `.rootrc` (see Root User's guide).
The prototype can be found: `$ROOTSYS/etc/system.rootrc`.

2.3 Geant4

Installation date:	11-Dec-2001
Version:	**v3.1**
Installed at:	`/home/gogi/geant4/`
Source:	**CERN**
Download from:	**www.info.cern.ch/asd/geant4/geant4.html**
Class reference:	**geant4.kek.jp/cgi-bin/G4GenDoc.csh?flag=1**

3 Environmental variables

Before you start program compilation the following environmental variables have to be defined in your working area. The definitions presented in the following table correspond to `kl-3.kek.jp` computer.

```
export CLHEP_BASE_DIR=/usr/local/include/CLHEP

export ROOTSYS=/home/gogi/root
export PATH=$ROOTSYS/bin:$PATH
export LD_LIBRARY_PATH=$ROOTSYS/lib

export G4INSTALL=/home/gogi/geant4
export G4SYSTEM=Linux-g++
```

These variables could be initialized in: `.bashrc` file.

4 Download of E391aG4 Software

`E391aG4` program can be downloaded fromthe address: psux1.kek.jp/ẽ391/software/index.html into your home directory. To run program you should issue the following commands:
> `tar zxvf E391aG4.tar.gz.58x`

```
> cd E391aG4
> make
> Linux-g++/E391a
```

5 Makefile Corrections and Run

See 'GNUMakefile' and correct settings if needed. You should set username:

user := your-login-name

You should define two variables: `G4INSTALL` and `G4SYSTEM`. At the moment 'GNU-Makefile' is configured to use on `kl-3.kek.jp` so the definitions are the following:
```
G4INSTALL :=/home/gogi/geant4
G4SYSTEM:= Linux-g++
```
and should not changed. Program compillation:

```
> make
```

Working program will be placed at `$HOME/E391aG4/Linux-g++/E391a` Run it:

```
> Linux-g++/E391a
```

All histograms will be collected in file `$HOME/E391aG4/E391aHist.root` and have to be analysed by ROOT.

6 Modifications

7 Class Description

User knowwledge of C++ programming language and Geant4 User's guide are necessary to modify and maintain the code or to add new classes.