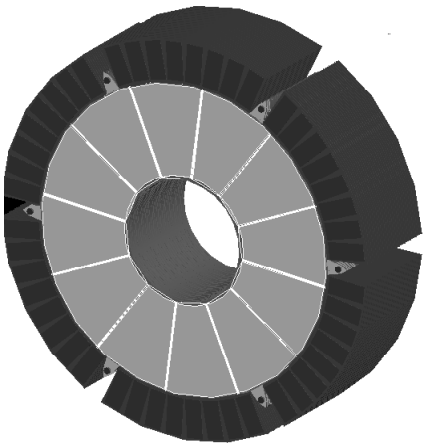

LumiCal Simulation Package User Guide

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(PS: something here ?)

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Contents

1 Introduction

The LumiCal Simulation [**LuCaS**] package is easy to use **GEANT4** based application devoted for simulation of LumiCal (the luminosity monitor for ILD). Entire FCAL (Forward Calorimetry) detectors of ILD (LumiCal, LHCAL, BCAL beam pipe and mask) are build, but only LumiCal is set to be sensitive detector (*i.e.* hits are stored in the output file).

2 Installation

The LuCaS package need *Geant*4 and ROOT packages to be installed on the system. After unpacking tarball, move to the directory LUMICAL

- >cd LUMICAL

then inspect file setup.csh (setup.sh if you are working with bash) and make appropriate to your environment changes. Particulary specify location where Geant4 and ROOT packgages are installed. Execute:

- > source setup.csh (or if you are running bash >. setup.sh)
- > gmake

this (if succesfull) will create **./bin/<OS-SYSTEM>** directory where the **Lucas** executable will be placed. Now you are ready to run the program. For convinience you may want add the path to **Lucas** location in to your **PATH** environment variable.

3 Using LuCaS

If everything went O.K. now you can start the Lucas with default confinguration in the interactive mode executing command :
> **Lucas -i**
One may want to inspect **./geant4-macros** directory to see available visualisation macros.

3.1 Command line parameters

Full list of available command line parametrs can obtained with command:
>**Lucas -h**
this will print on your screen :

```
Usage:          Lucas [options]


-h              print this help message and exit
-b              batch mode
-i              interactive mode (default)

-m <filename>   specifies a macro file to be executed before running
                (default none)

-o <filename>   specifies file name for ROOT output.No default
-M <mode>       specifies ROOT file opening mode ( default is NEW
                to avoid accidental file overwriting
                Possible values are RECREATE/UPDATE
-A              accumulate events from entire Run are to be
                written in one event ( suitable only for beam background data )

-c <double>     specifies the Geant 4 production range cut in mm
                (default is 0.005 mm)
-x <double>     specifies the Beam Crossing Angle in mrad
                (default is 0 [mrad])
-s <filename>   specifies name of the file with geometry setup
-P <int>        specifies printout level ( default is 0= minimum
                                                      3= debug printout
```

3.2 Steering file parameters

Parameter name	Default value	Description
Lcal_z_end	2635.0 mm	defines distance of LumiCal from IP
Lcal_inner_radius	76.0 mm	absorber inner radius
Lcal_outer_radius	197.2 mm	absorber outer radius
Lcal_SensRadMin	80.0 mm	silicon sensor inner radius
Lcal_SensRadMax	195.2 mm	silicon sensor outer radius
Lcal_n_layers	30	number of detector planes
Lcal_n_tiles	12	number of in one sensor plane
Lcal_n_sectors	48	number of azimuthal divisions
Lcal_n_rings	64	number of radial divisions
Lcal_virtual_cells	1	virtual cells are used instead building physical one
	0	physical cells will be used

Table 1: Full list of Lucas geometry control parameters.

3.3 Accessing output tree