

Geant4 Application for Bremsstrahlung and γ Converter Simulation

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LUXE Meeting
February 11, 2019

Geant4 application for bremsstrahlung and γ converter

www.desy.de/~oborysov/lxtsim.tar.gz

Typical settings are in `lux_e_gamma.mac` file

Primary particle settings:

-
- particle type
 - momentum and position distribution has two options:
 - * `x=y=px=py=0` corresponds to `/lxphoton/gun/beamType mono`
 - * and Gaussian beam (`/lxphoton/gun/beamType gaussian`)
with settings of `sigma_x` and `sigma_y` at IP.
In this version the emittance is fixed for Gaussian beam,
but of course it can be changed in `PrimaryGeneratorAction::SetDefaultKinematic()`.
 - energy has two options:
 - * mono-energetic beam
 - * arbitrary spectra can be loaded from a file.
There are examples: `spectra_test1.txt` and `spectra_test_compt.txt`

Geometry:

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- target material, size, position;
 - World size and material;

Physics list:

-
- `emstandard_opt0`, 1, 2, 3, 4 and others.

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Simulation:

- secondaries production cut (/run/setCut)
- maximum step in absorber (/lxphoton/stepMax)

Output

- File name with histograms and TTree
- Histograms setting are in separate mac file (hist_settings.mac)
- Type of the particle which are saved in the TTree, their x and y position cuts.
Saving everything (which is also possible) produces quite a big file.

These are gcc, ROOT, GEANT4 and CMake used:

```
./cvmfs/clicdp.cern.ch/compilers/gcc/4.8.5/x86_64-slc6/setup.sh
./cvmfs/clicdp.cern.ch/software/ROOT/6.06.04/x86_64-slc6-gcc48-opt/bin/thisroot.sh
./cvmfs/clicdp.cern.ch/software/Geant4/10.02.p02/x86_64-slc6-gcc48-opt/bin/geant4.sh
./cvmfs/clicdp.cern.ch/software/CMake/3.5.2/x86_64-slc6-gcc48-opt/setup.sh
```

Installation:

```
cmake ./
make
```

Running:

```
./lxbeamsim luxe_e_gamma.mac 1
```

Geometry example with a magnet and one e- event

