

Geant4 presentation 2

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- ① Last time:
 - Installation
 - Testing
- ② Current development:
 - Getting to know the software
 - Run predefined settings
 - Change detector geometry
 - Check the output format
 - Reproduce figures

Creating a Geant4 project

- 1 Create a run manager (contains main function),
- 2 define detector construction,
- 3 create an action runner,
- 4 create a particle generator,
- 5 define the physics list.

Creating a Geant4 project

Run manager

Contains main function of the simulation and the execution commands.

Detector construction

Contains

- geometry of mother volume,
- geometry of detector,
- detector material and its properties,
- refractive index of detector material.

Action runner

Runs particle generating and computes the results.

Creating a Geant4 project

Particle generator

Defines

- particle type,
- particle position within the volume,
- direction of its momentum,
- type of particle generator.

Physics list

Registers

- physics of the environment,
- physics of the detector,
- physics to allow for extra particles.

- G4RunManager
- G4UImanager
- G4VisManager
- G4VisExecutive
- G4UIExecutive
- G4ParticleGun
- G4LogicalVolume
- G4PVPlacement
- G4NistManager
- G4VUserActionInitialization
- G4VUserPrimaryGeneratorAction
- G4VUserDetectorConstruction
- G4VModularPhysicsList
- G4EmStandardPhysics
- G4OpticalPhysics
- G4VPhysicalVolume
- G4SystemOfUnits
- G4Box

Parameters of simulation

Detector construction

- Aerogel = Silicon + water + carbon
- Mother volume is a box (0.5 m, 0.5 m, 0.5 m,)
- Detector is a box (0.4 m, 0.4 m, 0.01 m)

Particles

- Particle gun fires one particle.
- Proton type.
- Momentum is Z-directional and is 100 GeV.

Physics

- Electromagnetic inetraction.
- Optical photons. (Not showing, further investigation required.)

Where is the output?

The plan is always flawless

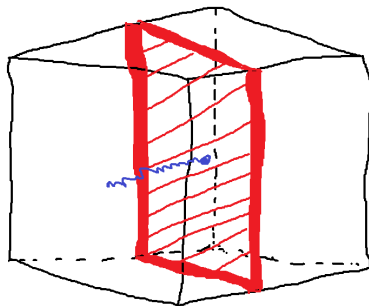
Casualties of war

- 1 WSL + Xming do not sync
- 2 VirtualBox current version is buggy
- 3 VirtualBox older version forgets ISO file
- 4 Virtual Ubuntu is dead
- 5 Admin issue prevents dual boot

Solution (coming soon)

Server machine from the university.





The detector and its mother volume. The blue line indicates the trajectory of the proton and the red field is the detector volume.