

WG 5.2.1 Meeting Simulation - Phase-I

Nov. 3rd 2022

Marco Leite (USP)

WG 5.2.1 Simulation Phase-I

Minutes from Oct. 27th. 2022 meeting



Attendance : G. Saito, G. Giacominni, M. Morales, M. Leite

Hide

Introduction (M. Leite)

- Minutes from previous meeting for comments
Described the open issues, the severity and the effort needed to work on each one

TCAD Simulation (R. Buhler , R. Giacominni)

- TCAD is running Taylor's AC-LGAD example
- Rudolf has shown results of calculated electrical field and current in the pads
- Plan is to present first results at meeting with UCSC

Geant 4 Simulation (M. Morales)

- M. Morales has a merge request for a version saving the data, including the Energy deposited in the device
- We need now to move to a first "stable" version

Action Items

- TCAD Simulation :
 - ◊ Will aim for presentation to UCSC group next meeting, discuss offline if needed
- Geant4 Simulation :
Move towards a stable version in gitlab

M. Leite, 27/10/2022

WG 5.2.1 Simulation Phase-I - Gitlab Issues

Project issues in Gitlab as of Today (03/11/2022)

OPEN

Geant4 2 5 +

- Validate advanced GDML Geometry construction
Effort Medium Feature New
Priority Medium
Nov 30 4
Needs attention
usp9/UFSD/simulati... #2
- Threshold for photons in physics processes
Effort Low Priority Low
Nov 10 1
usp9/UFSD/simula... #11

TCAD 2 16 +

- Explore the AC-LGAD first example in Sentaurus (UCSC)
Effort Medium Feature New
Priority High
Oct 24 9
Needs attention
usp9/UFSD/simula... #14
- Generate electrical field for the AC-LGAD structures from Taylor's example
Effort Medium
Priority Blocking
Oct 24 7
usp9/UFSD/simula... #14

KDetSim 1 0 +

- Understand the input files needed to simulate a LGAD
Effort Medium Priority High
Oct 31
usp9/UFSD/simulati... #2

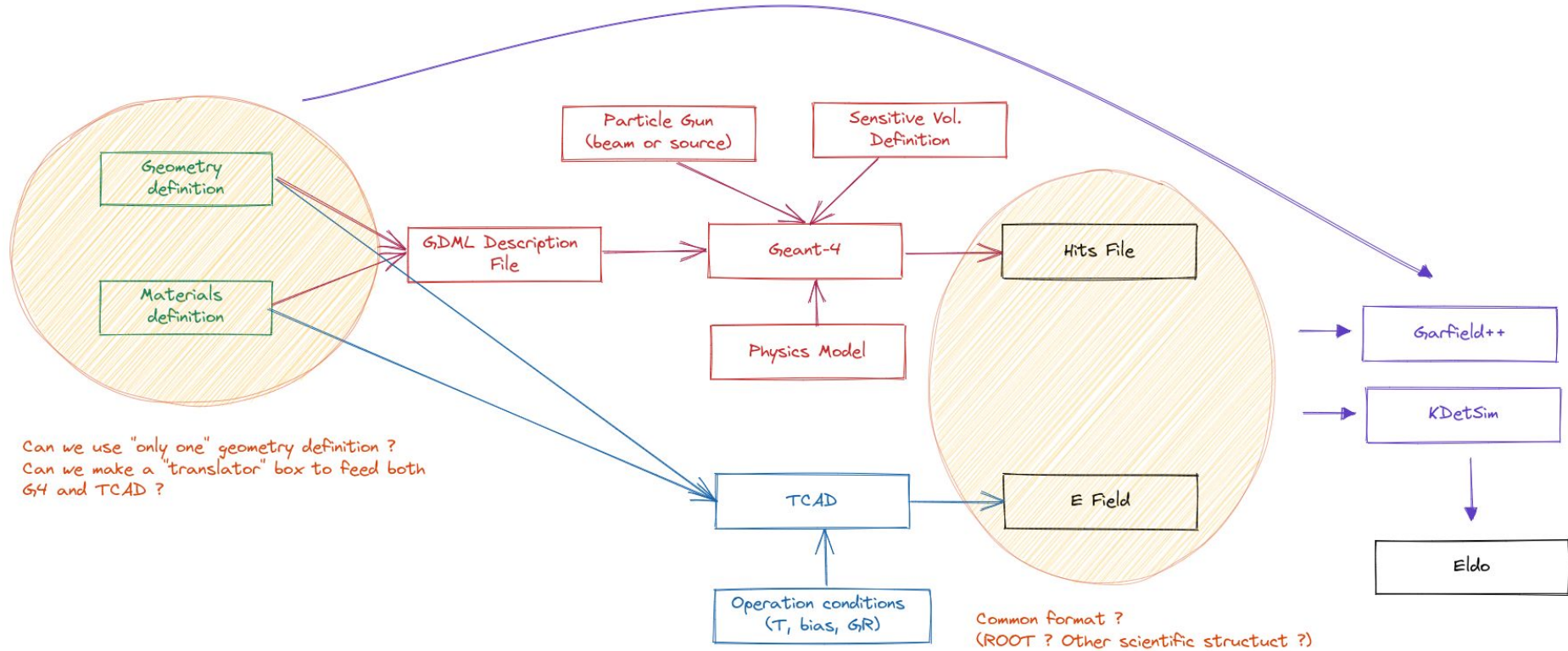
Garfield++ 1 2 +

- Commit working example of UFSD
Effort Low Feature New
Priority Medium
Nov 11 2 On track
usp9/UFSD/simulati... #1

Threshold for photons in physics processes

- usp9/UFSD/simulation/geant4-simulations#11 · created 32 seconds ago by Marco Leite Nov 10, 2022 updated 32 seconds ago
- Understand the input files needed to simulate a LGAD
usp9/UFSD/simulation/kdetsim#2 · created 6 days ago by Guilherme Saito Simulate a DC LGAD Oct 31, 2022 updated 5 days ago
- Commit working example of UFSD
usp9/UFSD/simulation/garfieldpp#1 · created 1 week ago by Marco Leite Nov 11, 2022 updated 1 week ago
- Generate electrical field for the AC-LGAD structures from Taylor's example
usp9/UFSD/simulation/tcad-simulations#4 · created 1 month ago by Marco Leite Oct 24, 2022 updated 1 week ago
- Validate advanced GDML Geometry construction
usp9/UFSD/simulation/geant4-simulations#2 · created 1 month ago by Marco Leite Nov 30, 2022 updated 1 week ago
- Explore the AC-LGAD first example in Sentaurus (UCSC)
usp9/UFSD/simulation/tcad-simulations#1 · created 1 month ago by Marco Leite TCAD Initial configuration and development Oct 24, 2022 updated 1 week ago

WG 5.2.1 Simulation Phase-I - Charge Transport



WG 5.2.1 Simulation Phase-I - Charge Transport

- Would be important to have the E field calculated by TCAD to import to Garfield++ and other ad-hoc simulators
- How far are we from that ??
 - Can we have a file to test ?

4.2.2. Synopsys TCAD

Electric fields calculated using the device simulation program Synopsys Sentaurus [46] can be imported with the classes `ComponentTcad2d` and `ComponentTcad3d` (derived from the base class `ComponentTcadBase`).

The function to import the field map is

```
bool Initialise(const std::string& gridfilename,  
               const std::string& datafilename);
```

gridfilename name of the mesh file, the extension is typically `.grd`

datafilename name of the file containing the nodal solution; the filename typically ends with `_des.dat`

Both files have to be exported in DF-ISE format, files in the default TDR format cannot be read. To convert a TDR file to `_des.dat` and `.grd` files, the Sentaurus tool `tdx` can be used

```
tdx -dd fieldToConvert.tdr
```
