

WG 5.2.1 Meeting Simulation - Phase-I

October 27th 2022

Marco Leite (USP)

WG 5.2.1 Simulation Phase-I

Minutes from Oct. 20th. 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 example
- Plan is to present first results at meeting with UCSC
- Check the option to save the E field to export to the signal simulation

Geant 4 Simulation (M. Morales)

- M. Morales will work on the version to save the data as root file
- We will need position and momentum of the electrons in the medium

Action Items :

- TCAD Simulation :
 - Priority is to get some results
 - Will aim for next meeting, discuss offline if needed
- Geant4 Simulation :
 - Data persistence as ROOT file
 - Upload code to Gitlab

M. Leite, 20/10/2022

WG 5.2.1 Simulation Phase-I - Gitlab Issues

Project issues in Gitlab as of Today (27/10/2022)

The screenshot shows the Gitlab Issue Boards interface. At the top, there are filters for 'Project' and 'New board', and a search bar. Below are four boards:

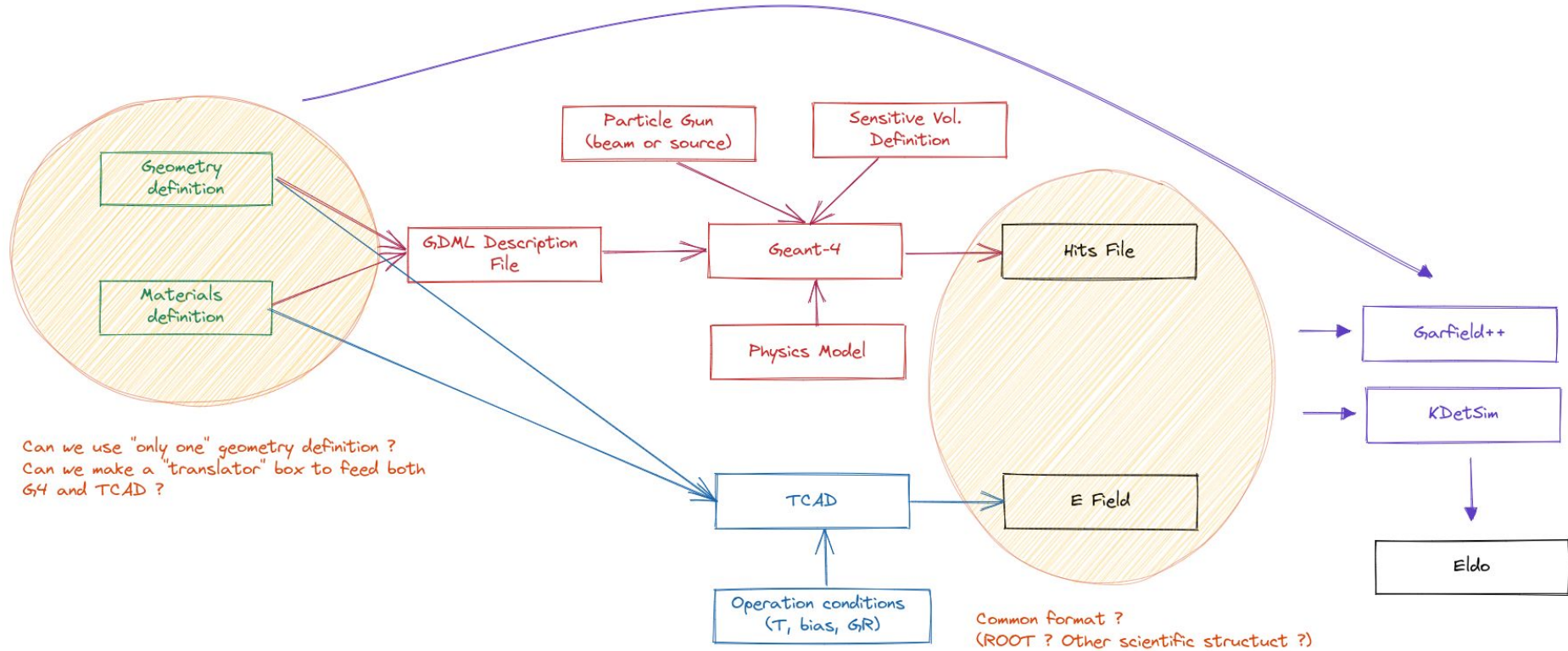
- Geant4** (1 closed, 4 open):
 - Validate advanced GDML Geometry construction (Effort Medium, Feature New, Priority Medium, Nov 30, 4, Needs attention)
 - usp9/UFSD/simulati... #2
- TCAD** (2 closed, 16 open):
 - Explore the AC-LGAD first example in Sentaurus (UCSC) (Effort Medium, Feature New, Priority High, Oct 24, 9, Needs attention)
 - usp9/UFSD/simula... #1
 - Generate electrical field for the AC-LGAD structures from Taylor's example (Effort Medium, Priority Blocking, Oct 24, 7)
 - usp9/UFSD/simula... #4
- KDetSim** (0 closed, 0 open):
- Garfield++** (1 closed, 2 open):
 - Commit working example of UFSD (Effort Low, Feature New, Priority Medium, Nov 11, 2, On track)
 - usp9/UFSD/simulati... #1

OPEN

The screenshot shows the Gitlab Issues list view. At the top, there are filters for 'Open 4', 'Closed 9', and 'All 13'. There are also icons for RSS, calendar, and 'Edit issues', and a button 'Select project to create issue'. Below is a search bar and a 'Created date' filter. The list of issues is as follows:

- Commit working example of UFSD** (On track, Effort Low, Feature New, Garfield++, Priority Medium)
 - usp9/UFSD/simulation/garfieldpp#1 · created 13 minutes ago by Marco Leite · Nov 11, 2022 · 2
 - updated 7 minutes ago
- Generate electrical field for the AC-LGAD structures from Taylor's example** (Effort Medium, Priority Blocking, TCAD)
 - usp9/UFSD/simulation/tcad-simulations#4 · created 3 weeks ago by Marco Leite · Oct 24, 2022 · 7
 - updated 5 days ago
- Validate advanced GDML Geometry construction** (Needs attention, Effort Medium, Feature New, Geant4, Priority Medium)
 - usp9/UFSD/simulation/geant4-simulations#2 · created 1 month ago by Marco Leite · Nov 30, 2022 · 4
 - updated 21 minutes ago
- Explore the AC-LGAD first example in Sentaurus (UCSC)** (Needs attention, Effort Medium, Feature New, Priority High, TCAD)
 - usp9/UFSD/simulation/tcad-simulations#1 · created 1 month ago by Marco Leite · TCAD Initial configuration and development · Oct 24, 2022 · 9
 - updated 2 days 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
```
