WG4 updates

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2/9 -24

Today's agenda

- Sub-groups organisation

  - This was discussed at the last meeting, but also at this one to make sure that everyone has a chance to express their opinions

  - This will serve as the categorisation for meetings going forwards

- Round-table presentations

  - Contributions to discussions and minutes are welcome

  - Eunjin Choi will present her work as a DESY summer student, concerning hexagonal MAPS simulations using generic doping profiles

- Discussions and any other business

Sub-groups organisation (slide from last meeting)

More aligned with WG4 research goals from the DRD3 scientific proposal

DRD3
– WG4 –

Previous categories (topics-oriented)

- Monolithic and hybrid sensor simulations
- Front-end electronics simulations
- Radiation damage and radiation environment simulations
- Gain layer/impact ionization simulations
- Non-silicon sensor simulations
- 3D sensor simulations
- Charge transport and integration of simulation tools

Current categories (WG4 Research Goals-oriented)

- CMOS simulation and connection between device-level and electronics sim. (RG 4.1)
  - monolithic sensor simulations
  - front-end electronics simulations
  - signal read-out and processing
- Other detectors/technologies/activities
  - hybrid sensors (LGADs, 3D, strip detectors, ...)
  - process simulation
  - particle-matter interaction (GEANT4, FLUKA, ...)
  - charge carrier transport simulation
- Newly measured semiconductor properties (RG 4.2)
  - non-silicon sensors simulation
  - gain layer/impact ionisation simulation
- Radiation damage: validation with measurements and development of high-fluence models (surface and bulk) (RG 4.3 - 4.4)
  - definition of benchmark models
  - high-fluence models
  - radiation environment simulations
- Time dependent electric/weighting field (RG 4.5)
  - adaptive fields
  - signal formation in detectors with resistive electrodes
  - charge transport
- Simulation tool development
  - integration of simulation tools
  - machine learning

Other updates

- Meetings back to **fortnightly** frequency now, so the next meeting will be held on the **16th of September**

  - If we find this too frequent, it will be reduced to once every three weeks (but time will tell)

Backup slides

DRD3 WG4 research goals from scientific proposal

WG4 research goals <2027	
	Description
RG 4.1	Flexible CMOS simulation adaptable to different technology nodes and development of connections between tools for device-level simulation and electronic circuit design/validation
RG 4.2	Implementation of newly measured semiconductor properties into TCAD and MC simulations tools
RG 4.3	Definition of benchmark for validating the radiation damage models with measurements and different benchmark models.
RG 4.4	Developing of bulk and surface model for $10^{16} \text{cm}^{-2} < \Phi_{eq} < 10^{17} \text{ cm}^{-2}$
RG 4.5	Collate solutions from different MC tools and develop an algorithm to include adaptive electric and weighting fields