

WG4 Working Meeting

Detector Physics Modelling and Simulation

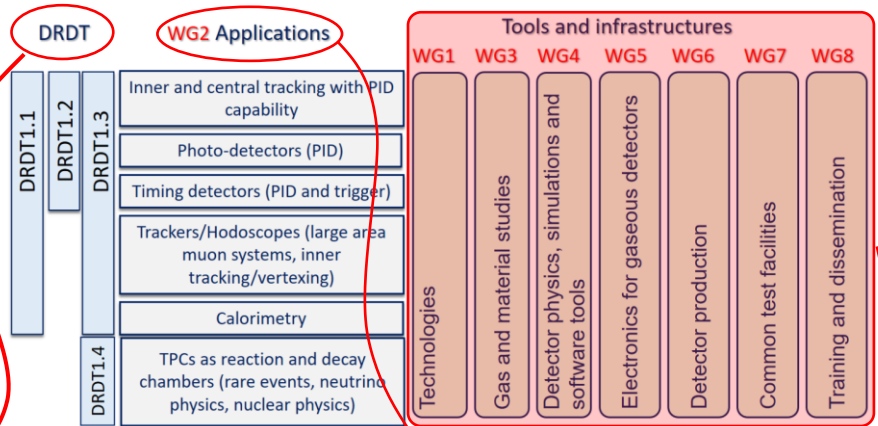
Very short Intro to DRD1 & WG4



Implementation of Detector Roadmap



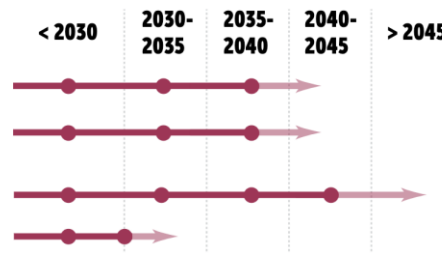
Creation of R&D collaborations (DRD)



Detector R&D Themes



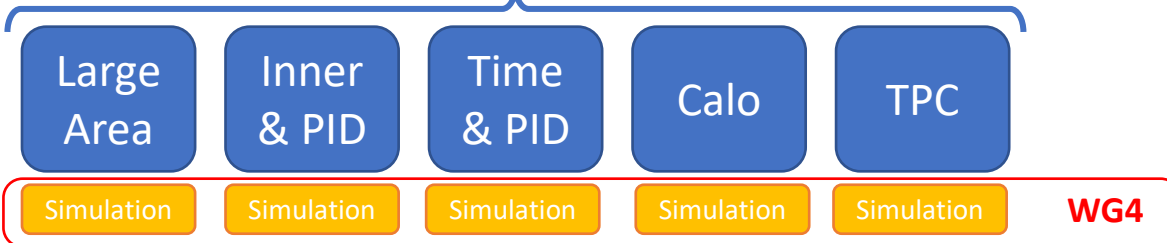
- DRDT 1.1** Improve time and spatial resolution for gaseous detectors with long-term stability
- DRDT 1.2** Achieve tracking in gaseous detectors with dE/dx and dN/dx capability in large volumes with very low material budget and different read-out schemes
- DRDT 1.3** Develop environmentally friendly gaseous detectors for very large areas with high-rate capability
- DRDT 1.4** Achieve high sensitivity in both low and high-pressure TPCs



Applications in Work-Packages

- Funding is here
- Deliverables are here
- Can compare to the experiments (e.g. ALICE, ATLAS, CMS, LHCb) for HL-LHC Upgrade R&D

Workpackages



Workgroup AIMS at:

Communication, Best Practices, Common developments, ...
Use Expertise of the community

WG4 Working Meeting

- Goal is an informal “get to know each other”
 - Knowing each other is first step in working together
 - Not another meeting to introduce physics motivations and present results
- This Meeting aims at understanding / discussing
 - Personal / group interests in Simulation & SW Development
 - Simulation approach to tackle certain problem/application
 - Discussing strategy, most optimal tools, limitations of these tools ...
 - Discussing what new developments are required to reach the goal to “realistically” simulate certain problem / application
 - How to make a “community”
 - How to optimize communication – what tools to use?
 - How to optimize knowledge spread through our community – tools?
 - What services we can provide to new-comers to get started
- Part of a larger story – long-term Aim:
 - Identify common research and form sub-groups to tackle problems
 - Identify group that will take on common tasks (documentation / teaching)

WG4 News



- **Last DRD1 Collaboration meeting**
 - Extended conveners until June '24
- **Launched a survey**
 - 10 questions – 5' of your time
 - LINK: [survey](#) – Fill in if you did not do so
 - Please fill out by 16/02
 - So far 75 responses – **success!**

WG4 Communication Tools

What will we use?



Subscribe and help your colleagues out with your expertise

- DRD1 Website & DRD1 email list – *please subscribe!*
 - drd1-wg4@cern.ch => all persons interested
 - drd1-wg4-conveners@cern.ch => conveners
 - *Drd1 website as starting point for newcomers*
- DRD1 Discourse - Forum for WG4
 - <https://drd1-forum.web.cern.ch/t/about-the-wg4-software-and-simulation-category/19>
- Garfield++ website
 - ROOT Forum dedicated to garfield++
 - <https://root-forum.cern.ch/c/garfieldxx/25>
- Documentation and Examples
 - Open for suggestions on how to do this
 - Gitlab repo for examples
 - Twiki with link to Gitlab pages of colleagues
 - Review articles (to be written)

Today's agenda

- Round table of all participants
 - *With or without slides – 5' each - also part of next meetings*
- Would be good / usefull if we could understand for each group to which task they are most interested – (not a COMMITMENT)

Task	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	4.10
	Garfield Modernization	Garfield FWK improvement	Simulation Large Avalanches & Space charge	Simulation of Resistive Detectors (MPGD / RPC)	Large Volume	ECO-gas and cross-sections – Boltzmann solvers	Simulation of Detctor Gain and Detector Signal (Penning & Ion Mobilities)	Fast Simulation of Gaseous Detectors in Experiments	Simulation of Optical Readout – Photon cross-sections and Luminescence	Simulation of Negative Ions
Group 1										
Group 2										

- Common topics where work can start already now
 - Group dedicated to discuss the simulation school & simulation exercise
 - Group dedicated to communication / information sharing / percolation